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NECESSITY AND PERSPECTIVES OF FORMATION OF THE STATE OF FOOD SECURITY

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ABSTRACT

In the periods of positive dynamics of economic development it has usually dominated the attitudes towards the state non-interference in the economic processes, and upon occurrence of the next phase - the recession of production, particularly with the signs of stagflation, they have been replaced by the diametrically opposing views, which have tried to prove the need for the state active interference in the processes of sustainable economic reproduction. In the whole the states affect the agri-food complex, the market of agricultural products and the food supplies. However, the methods and tools of this influence depend on the purpose to be achieved with such a regulation.

The world experience of development of market economy shows that the agriculture and the market of agricultural products are not the self-regulating systems due to the specific characteristics. It is explained primarily by the conservatism and inertia of agriculture as a production system, as well as a low elasticity of demand for the agricultural products and high price elasticity to them. The inability of market mechanism to direct the development of economic entities of different industries and regions into one common goal, calls for the state intervention in all spheres of the economy, one of the most important of which is the agriculture.

Keywords: food security, consumption rate, food availability.

INTRODUCTION

Most of the activities and mechanisms to ensure the food security policy should be implemented at the state level, because without the centralization and coordination of actions of all the parties, it is practically impossible to ensure it. The implementation of such complex process involves a combination of state agricultural, economic and social policies. The activities of the state and society on the formation of food security shall be based on an objective comprehensive analysis and forecasting of the situation in the field of supply of food resources, their consumption, interaction of the basic elements of the food security system of the country.

The food security system is determined by the state laws, decrees and orders of the President. On this basis, the government implements a number of powers, which include provision of the implementation of a uniform state policy in the sphere of formation of food security, development and implementation of the corresponding state programs.

Formation of the market environment in the food sector changes the nature of administrative influence on the enterprise by the public authorities, it is increasingly carried out in an indirect way. The state, instead of the direct administrative functions, has decisively shifted to the regulation of economic levers, creation of the necessary legal and regulatory framework

(Battalova and Abdulin, 2014). The economic levers of state regulation include the tools by which the conditions for the development of market processes are created in the right direction. The economic ones work in the budgetary and fiscal policy plane, as well as in terms of price regulation.

The legal basis of the administrative and economic methods of regulation is represented by the various forms of legal regulation - laws, presidential decrees and orders of the local self-government authorities. The food problem is actualized in the absence of a clear legal definition of the concept of food security, creates uncertainty in the actions of the state administrative apparatus and leads to errors in the formation of the economic development programs both of the country as a whole and of its regions (Battalova and Kundakchyan, 2015).

Upon the food security formation it is necessary to ensure a joint targeted and coordinated action of the legislative and executive bodies at all levels, to create an appropriate regulatory legal framework, to develop an effective organizational and economic mechanism.

The solution of the food security problems will be addressed by the following administrative measures: adoption of a system of regulatory and legal acts; it is necessary to develop and adopt the regional food security strategies at the regional level.

Moreover, given the desire to integrate into the world and European community, it is necessary to elaborate the legislative framework in accordance with the requirements of the international standards. As world practice shows, the underestimation of the economic role of the state generates negative consequences. At the same time, one cannot exaggerate the capabilities of the state, without recognizing the role of the market economy. An intelligent synthesis of state regulation and market mechanism enables to solve the main socio-economic problems of the agricultural sector of the country. The state intervention in the market economy should be economically justified and acceptable in the scope that enhances the economic efficiency of production (Hanushek, 2000).

The state shall use its regulatory functions to enhance the food market opportunities by eliminating the weaknesses in the domestic market, preventing an occurrence of external influences, strict control of natural or other monopoly, as well as providing the consumers with the accurate information about the quantity and quality of food products. Applying the regulatory functions, the state and its bodies should examine in detail the possibility and efficacy of application of various methods of regulatory impact in each case (Safiullina et al., 2014).

The desire of the country to enter in the international community necessitates a systematic approach to the analysis of contemporary processes of development of agricultural production in order to develop the appropriate regulatory mechanisms that can ensure a fast industry adaptation to the new conditions of economic management. The global trends in the context of globalization relate, on the one hand - to more open food markets (this includes mostly the developing countries), on the other - to the targeted measures to ensure the food security of every developed state by implementing the protectionist measures. The versatility of the food security problem necessitates finding ways and mechanisms for its provision. In developed countries it is used, as a rule, two basic approaches to food security: the first - the priority support of agricultural food producers and the guaranteed maximum self-provision with all major types of food; the second - the same support for both the food producers and food consumers (Garifova et al., 2014).

To ensure the food security it is necessary to take into account the relationship between the domestic and imported products, the state of development of processing industries, procurement and trade institutions, the establishment of food prices affordable for the great bulk

of the population and the like. So, in fact, the provision of food security covers the entire agro-industrial complex of the country. Since the production resources are formed in the area of agro-industrial production, the agro-industrial complex is a guarantor of the social and economic stability of society, economic security and independence of the state, respectively.

RESEARCH METHODS

This technique will enable fast enough to analyze the food security at the regional level of the economy based on the analysis of a set of indicators of economic and physical product availability, self-sufficiency in the region with the main types of food products. The resulting data can be used by the regional authorities in the planning and development of regional economic and agri-food policy.

RESULTS

To assess the level of food self-sufficiency (self-reliance) of the region for certain types of agricultural products it is necessary to use the self-sufficiency ratio (K_s).To calculate this indicator it is necessary to receive data on actual volumes of production of major types of agricultural products in the region during the reporting period (q); information about the population living in the region (n).We will need to determine how much food is necessary for the region according to the established rational standards of consumption (q_r) (Safiullin et al.,2012).

1.   To analyze the level of food self-sufficiency in the region it is necessary to compare the actual level of production of certain types of agricultural products in the region with the required amount of food, calculated in accordance with the rational standards of food consumption.

In this case, the formula for calculating the self-sufficiency ratio is as follows:

$$K_s = \frac{q}{n*qp},$$

(1)

where: K_s- self-sufficiency ratio;

q -   actual   scope   of   food   production   in   the   region;
n - population of the region;

q_r- necessary scope of food production in accordance with the rational standards of consumption.

As a result of the calculations, Ks can take different values, depending on which the index value can be attributed to a low, acceptable or optimal level: $K_s \le 0.5$ - low level of self-sufficiency; $0.5 < K_s \le 0.9$ - acceptable level of self-sufficiency; $0.9 < K_s \le 1$ - optimal level of self-sufficiency.

2.   The degree of satisfaction of the physiological needs of the population in the basic food enables to evaluate the actual food consumption ratio (K_{ac}).Calculation of this indicator involves comparing the actual volume of food consumption over a certain period of time (q_{actual})with the rational consumption standards ($q_{standard}$).According to the rational standards of consumption of food products that meet the modern requirements of a healthy diet, people should consume in a year: 95-105 kg of grain products; 95- 100 kg of potatoes; 120-140 kg of vegetables; 90-100 kg of fruits; 70-75 kg of meat and meat products; 320-340 kg of milk and milk products; 18-22 kg of fish; 24-28 kg of sugar (Gotsulyak and Ignatjeva, 2015)

3.   Calculation of the actual food consumption ratio is performed according to the formula:

$$K_{ac} = \frac{q\text{actual}}{q\text{standard}},$$

(2)

where K_{ac} - coefficient characterizing the actual level of food consumption with respect to rational standards of consumption;

q_{actual} - actual amount of food consumption over a certain period of time;

$q_{standard}$ - rational standards of consumption.

According to the results of calculations of actual food consumption ratios for different types of food products, it will be necessary to determine the average index value. The actual food consumption ratio by the population (K_{ac}) can take the following values: $K_{ac} \leq 0.5$ - low; $0.5 < K_{ac} \leq 0.95$ - acceptable; $0.95 < K_{ac} = 1$ - optimal.

The economic food availability for the population depends on the level of food prices and the real income of consumers. To assess the level of economic food availability for the population of the region, it is offered to use a number of indicators:

1) K_p - poverty ratio shows a share of the region's population with incomes below the established subsistence minimum;

2) K_c - consumption ratio, characterizing the proportion of food expenditures in the structure of household final consumption expenditures;

3) K_g - the Gini ratio.

It is not necessary to carry out any special calculations in this case, since these indicators are calculated by the federal and territorial organizations of state statistics. Nevertheless, it is necessary to determine in which parameters a particular indicator will be for the region (Ignateva and Abdullin, 2015).We offer to establish the following values of indicators to assess the food security of the region, which is presented in Table 1.

Table 1
THE SYSTEM OF INDICATORS AND CRITERIA OF THE REGIONAL FOOD SECURITY

Criteria	Indicator	Indicator value
1. The level of food self-sufficiency (self-reliance) of the region	$K_s = \frac{q}{n*qp}$	$K_s \leq 0.5$ – low; $0.5 < K_s \leq 0.9$ – acceptable; $0.9 < K_s \leq 1$ – optimal
2. The level of satisfaction of the physiological needs of the population in the basic food	$K_{ac} = \frac{q\text{actual}}{q\text{standard}}$	$K_{ac} \leq 0.5$ – low; $0.5 < K_{ac} \leq 0.95$ – acceptable; $0.95 < K_{ac} = 1$ - optimal
3. The level of economic food availability: - share of the population with incomes below the subsistence minimum; - proportion of food expenditures in the structure of household final consumption expenditures; - degree of uneven distribution of the population by income level	K_p K_c K_g	$K_p > 0.4$ – high; $0.2 < K_p \leq 0.4$ – acceptable; $K_p \leq 0.2$ – optimal $K_c > 0.5$ (or > 50%) – high; $0.25 < K_c \leq 0.5$ – acceptable; $K_c < 0.25$ - optimal $K_g > 0.5$ – high; $0.3 \leq K_g < 0.5$ -acceptable; $K_g < 0.3$- optimal

If the index value is in the optimal range, then this indicator is assessed with 2 points. If the index value is within acceptable limits, it is assessed with 1 point. For low or high index values, the assessment will correspond to 0 points. Data for the assessment of food security in the region can be conveniently represented in the form of a complex table (Table 2) (Larionova and Varlamova, 2013).

Table 2
ASSESSMENT OF FOOD SECURITY OF THE REGION

Criteria	Indicator value	Possible number of points
1. The level of food self-sufficiency (self-reliance) of the region	K_s	0 - 2
2. The level of satisfaction of the physiological needs of the population in the food products	K_{ac}	0 - 2
3. The level of economic food availability: - share of the population with incomes below the subsistence minimum; - proportion of food expenditures in the structure of household final consumption expenditures; - degree of uneven distribution of the population by income level Total:	K_p K_c K_g	0 – 2 0 – 2 0 – 2 10

Asa result, it will be received the total assessment of the regional food security, which can meet the following criteria (Table 3) (Kundakchyan and Zulfakarova, 2014).

Table 3
FOOD SECURITY CRITERIA

Number of points	Level of food security of the region
9 -10 points	optimal, high
5-8 points	medium, acceptable
less than 5 points	low

The resulting data can be used by the regional authorities in the planning and development of regional economic and agri-food policy.

CONCLUSIONS

The formation and development of food markets should be made, taking into account the peculiarities of industry potential, competitive environment, supply and demand for the specific products, as well as the opportunities to create the necessary food supplies and export.

An important element of the forecasted developments in the formation of a stable food market is conduction of alternative calculations of formation of food resources and determination

of the capacity of food markets through the use of economic balance model using the demand elasticity ratio on incomes.

It is necessary to develop a strategy and specific measures for the implementation of strategy aimed at coordination of state support for agricultural production, protection of the domestic food market with the requirements of liberalization of foreign economic activity in the trade field. Only the creation of own sustainable food security by ensuring the competitiveness of food products, both in domestic and foreign markets, protection of domestic manufacturers, will enable to avoid the possible devastating effects of the rapid growth of openness of the national economy.

CONCLUSIONS

To achieve a high level of food safety, the measures of state regulation should be implemented in two ways. Firstly, it is necessary to create the real conditions for increasing the volume of food production and the expansion of food market to a level, which will provide the population with food, regardless of the effective demand. And secondly, it is necessary to pursue an active social policy with a view to a consistent increase of effective demand of the population to a level, which ensures a balanced diet of an ordinary citizen of the state.

SUMMARY

The current state of food security requires allocating it within the economic policy of the state as an independent problem, the solution of which involves the development strategy of the food security system and its parameters. We shall form the conceptual approaches to the definition of the goals, objectives, principles, directions and stages of its implementation. The national food security strategy should cover the issues of increasing food production volumes, improving the quality and competitiveness of agricultural products and food products, sustainable rural social development, improving the living standards. To achieve this goal it is necessary to create the conditions for expanded reproduction in the agro-industrial complex, which is the backbone core of the formation of national food security. It is possible to solve this problem only on the basis of the agrarian sector reforming at the state regulation of agro-industrial production. The scope of regulation depends on the level of economic and social development of the economy, the balance of supply and demand on the agricultural markets.

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CLASSIFICATION OF AGROINDUSTRIAL COMPLEX TECHNICAL PROVISION EFFECTIVENESS INDEXES

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ABSTRACT

In conditions of import substitution one of priority directions of support of Russian agricultural economy economical effectiveness development level and its technical provision is the elaboration of effective measures for normal functioning of agricultural machine construction, agricultural goods manufacturers and agro-industrial complex in general.

In this work is considered a concept of production effectiveness. Diverse approaches to determination of effectiveness in interpretation of range of authors are proposed. Theoretical and methodological constituents of agriculture technical provision effectiveness indexes classification are considered and analyzed in this article. Problem of increasing of agro-industrial enterprises technical provision effectiveness is studied. For estimation of technical provision effectiveness a grouping of indexes aggregate is presented. There is presented classification of technical provision quantitative estimation indexes. There are considered such indexes as return of assets ratio, capitalization ratio, labor input, labor efficiency, capital-labor ration, profitability level, profit. Analysis of factors impacting at estimation indexes of agriculture economic technical provision effectiveness is conducted,

Conducted researches detected controversy of theory and drawbacks of method that stipulated a need of development of technical provision level quantity estimation.

Analysis of indexes characterizing effectiveness of technical provision detected that existing system of single indexes characterizing presence and use of separate factors of production does not allow to receive a meaningful presentation of agricultural technical provision effectiveness that has a direct impact on financial-economic activity of agricultural enterprise, which requires a further work in this direction.

Keywords: *economic effectiveness, resources, costs,* technical provision, profitability, fixed assets, *technical potential*, intensity, reproduction, current assets, financial result.

INTRODUCTION

In conditions of import substitution the actuality of issues of agricultural goods manufacturers technical provision effectiveness increases. The question arises: "By price of what costs and material-technical resources the final production result is achieved?" On this basis the major model of technical provision effectiveness is presented as ratio of economic results and costs. At this the purpose of any measure connected with effectiveness is the increase of result at lowering of costs.

Lowering of agricultural enterprises technical provision aggravates and complicates the solution of problems of economic effectiveness, pre-determines need for research of its causes and grounding of new ways out of existing economic situation of technical poorness of village.

There occurs a need of theoretical generalization of issues of efficiency management and classification of indexes of technical provision of agricultural production.

METHODS

In economic literature the concept of "effectiveness" is synonymic to such concepts as "result", "resources", "costs",

Studies of economic literature showed that majority of authors consider Adam Smith as founder of economic effectiveness theory.

Further his ideas were developed in works of D. Ricardo, K, Marx and other scientists. David Ricardo made attempts of estimation of capital effectiveness, thus proving that the less is the capital endurance, the more permanently spent labor is needed for preservation of its initial effectiveness. D. Ricardo uses the term "effectiveness" as ration of result to a certain costs type. Starting from this moment the concept of "effectiveness" becomes the economic category (Demchenko, 2013).

According to words of K. Marx: "Production is effective when at minimum of advanced capital could be produced a maximum quantity of product with as low costs of forces and funds as possible." The effectiveness category was also studied by such foreign scientists as Piters T., Waterman R., Harrington J., H. Fayol, H. Emerson, F. Taylor, H. Ford and others who think that namely the effectiveness is the most important characteristic of enterprise activity from the point of view of managers (Kleinknecht, 1981).

D.C. Sink considers "effectiveness" index as complex element of management system that includes such components as: effectiveness, efficiency, quality, profitability, productivity, quality of labor life, implement5ation of innovations (Freeman, 1987).

V. Pareto considers effectiveness as a level of economic organization where society extracts maximum of usefulness from existing resources and impossibility to conduct any improvement in one parameters of system without worsening of others (Utterback, 1979).

A vast number of scientific works and researches in domestic literature is dedicated to effectiveness. So, authors Kiseleva A.A. and Vlasov P. K. understand under effectiveness a result of functioning received in the shortest time at minimal spends of resources that provide a long-term effectiveness.

I. Ansoff, A. E. Voronkova and P.I. Otenko are estimating effectiveness as a degree of correspondence of actual result to the one that could be achieved at all completeness of conduction of functions by system in external environment (Leontiev, 2014). At this is not taken into account the fact that maximal use of potential could not be possible without estimation of demand and supply a the given market, which can leas to loss of financial stability of enterprise.

In Table 1 are proposed approaches to determination of effectiveness in different authors' interpretation.

Table 1
APPROACHES TO DETERMINATION OF EFFECTIVENESS IN DIFFERENT AUTHORS'
INTERPRETATION

Authors	Morphological sign	Determination of effectiveness
Bugutskii A.	result	Effectiveness is the manufacturing of production with minimum costs, use of minimal quantity of resources for manufacturing of the certain production amount a minimal average total costs.
Sabluk P.T.	proportion	Effectiveness is a a proportion of results to costs
Novikov Yu.N.	result	Economic effectiveness is always a positive result expressed in money form
Andriychuk V.G.	proportion	Economic effectiveness is a proportion of resources and results of manufacturing at which are received cost indexes of production effectiveness.
Karaman M.M.	proportion	Economic effectiveness is a proportion of received result and all labor costs and funds used for its production.

From analysis of these determinations in scientific literature comes a conclusion that "effectiveness is a proportion of results to costs with taking into account of market supply and demand providing long-turn perspective.

In agricultural economic are distinguished the following types of effectiveness: technological, economic, social and ecological. Technological effectiveness characterizes the degree of resource use in process of extended production; economic; economic one reflects achieved level of production relations through achieved production result; degree of social development of society is characterized by social effectiveness; ecological effectiveness reflects a level of population need in food satisfaction at minimum level of production costs and and environment preservation.

The essence of economic effectiveness increase is increase of results per unit of production, works and services. Increase of effectiveness can be achieved by cost of improvement of fixed assets use, acceleration circulating funds turnaround and by cost of increase of labor productivity. All this becomes possible at sufficiently high level of fixed and circulating funds and high-qualified labor resources provision.

In agricultural economic are distinguished the following types of economic effectiveness:

- effectiveness of agricultural economic as a branch;

- effectiveness of separate branches of agricultural economic (plant production, animal breeding, material-technical provision);

- effectiveness of separate types of animal production and agricultural cultures production;

- effectiveness of agricultural enterprises structural sub-divisions;

- effectiveness of separate directions: technical, organizational and organizational-technical.

On basis of set research tasks we will consider the effectiveness of material-technical provision of agricultural business in details.

Technical provision in agricultural business is characterized by composition, forms and methods of exploitation of material and human resources involved in production process.

Consideration of effectiveness issues of technical provision requires classification of effectiveness in general. Classification allows to distribute homogeneous indexes by groups , respectively to certain signs laid in a basis.

For estimation of technical provision effectiveness all aggregate of indexes could be grouped as follows:

– presence of technical provision elements (quantitative estimation);
– quality of technical provision elements;
– intensity of technical base use;
– rate of technical base reproduction;
– result of technical base use.

Elements of technical provision (complex of technical means, organizational forms of technical means use, engineer-technical personnel, instruction materials on technique use) are sufficiently wide studied in economical and technical literature. On basis of a row of authors' works, indexes of technical provision quantitative estimation indexes are classified by a range of signs in Table 2.

Table 2
CLASSIFICATION OF TECHNICAL PROVISION QUANTITATIVE ESTIMATION INDEXES

Signs	Indexes
- by index type	absolute
	relative
	average
- by measuring method	natural
	cost
	conditional
	dimensionless
- by method of receiving	regulatory
	actual
	calculated
- by generalization level	by organization
	by municipal district
	by region
	by country
	at level of countries communion

RESULTS AND DISCUSSION

Qualitative estimation of material constituent of technical provision lays in estimation of object in real execution through analysis of external parameters, technical properties and also properties that comply to requirements of social-economic and sociological system (TC, GOST). Qualitative estimation of engineer-technical personnel is characterized by aggregation of estimation indexes, proffessional qualification of engineer-technical employees, age composition.

Indexes of use intensiveness on separate elements of techniocal provision are well studied and represents indexes of technique, machines, equipment use, characterize service hours per

certain time period of amounts of production received. Use of engineer-technical employees of characterizes by quantity of time worked in certain period, coefficient of working hours use and presence of labor resources.

At analysis of indexes characterizing rate of material resources reproduction in economic literature a significant attention is paid to criteria of circulating capital turnover. Here belong the turnover coefficient and turn length.

To effective indexes allowing to estimate effectiveness of technical potential and technical provision could be related returns on assets, capitalization ratio, labor inputs, labor productivity, capital-labor ratio, profitability level, profit. However, these indexes reflect the general picture of fixed assets use which s not characterizing a particular impact of agricultural enterprise provision by technique on final financial result.

Considered indexes of agricultural economic technical provision effectiveness are subject to impact of a range of factors. Economic factors are classified by diverse signs:

- general (impacting a range of indexes);
- particular (for given index);
- external;
- internal;
- major;
- minor;
- direct impact;
- indirect impact.

External factors are not depend on enterprise activity but significantly impact on all production activity of organization. To such factors belong: state politics, development of scientific-technical progress, change of supply and demand, general economic and social-economic development of he country, natural-climatic conditions.

Major factors impact directly on financial-economic results pf enter[prises, and internal and indirect practical do not have any impact on activity results by also have a significant meaning. Internal factors are divided in the the following groups: organizational, technical, financial-economic, market.

CONCLUSIONS

This classification allow to detect in-house reserves of technical provision effectiveness increase by cost of extensive (reserve supplies, search for rational ways of resources use) and intensive factors (unaccounted opportunities, analysis of strong and weak sides, search of new ways of problems solution, use of trends of scientific-technical progress). This means that difference between factual level of resources use and possibilities defined by production potential can become a reserve of technical provision effectiveness increase.

SUMMARY

Conducted researches detected controversy of theory and drawbacks of method that stipulated a need of development of technical provision level quantity estimation.

Analysis of indexes characterizing effectiveness of technical provision detected that existing system of single indexes characterizing presence and use of separate factors of production does not allow to receive a meaningful presentation of agricultural technical provision effectiveness

that has a direct impact on financial-economic activity of agricultural enterprise, which requires a further work in this direction.

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RESEARCH OF CONTEMPORARY STATE AND PROBLEMS OF MEAT-PROCESSING BRANCH OF FOOD INDUSTRY OF RUSSIA

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ABSTRACT

Food industry is one of strategic branches of economic, called to provision of stable supply of Russia population by the most necessary but at the same time quality products. Development level of this industry and meat-processing enterprises in particular determines current life necessities of country population and is an important constituent of food safety of Russia.

This article comprises results of research of condition and problems of meat-processing branch of food industry. Statistic data on production and consuming of meat and meat products in Russia are considered and analyzed.

Crisis state at market has ambiguous consequences for meat industry, which in turn impacts both positively and negatively on Russian market of food industry. One of the most important problems detected in course of research, is non-provision of enterprises of meat-processing industry by competitive raw materials of domestic production. Major suppliers of meat and meat products into Russian Federation were studied. Long-term interests of state dictate the necessity of development of domestic meat-processing branch not only in order to suffice internal demand. but also to provide export supplies of separate meat production types in perspective.

Keywords: Competitive ability of domestic enterprises. food safety, development of meat industry, dynamic of meat and meat products consumption, level of population life, quality of life, level pf population income, average prices for meat, consumption norm, meat processing enterprises, imported raw materials.

INTRODUCTION

Effective development of domestic industry branches supposes production and realization on market of production satisfying both manufacturer and consumer, and the main factor in this process is competitive ability. Enterprises play the role of complicated production system of interconnected business-processes actively interacting with external environment. Particular place is help by estimation of competitive ability of enterprises, formation and realization of competitive strategies on level of state and also on level of medium and high management of enterprise.

Competitive advantages are determined by aggregate of properties: level of consumer demand satisfaction, characteristics and peculiarities of realization of business processes, the main purpose of which is achievement of advantages in relation to enterprise expenses. That's

why it is reasonable to consider high productivity of organization's business processes as the most important criteria of its competitive ability. Food industry is one of strategic branches of economic, called to provision of stable supply of Russia population by the most necessary but at the same time quality products. Development level of this industry and meat-processing enterprises in particular determines current life necessities of country population and is an important constituent of food safety of Russia. At present time, problems of provision of food safety, competitive ability of meat processing industry enterprises are handled by: Houben, J.H., Adesokan, H.K., Raji, A.O.Q. Manios, S.G., Grivokostopoulos, N.C., Bikouli, V.C., Doultsos, D.A., Zilelidou, E.A., Gialitaki, M.A., Skandamis, P.N.A., Stanciu, S., Rizea, R.D., Ilie, A.G., Zhou, Y.-J., Li, J.-X., Wang, Y.-N., Liu, Y.-J., Wang, S.-J., Brown, C.G., Longworth, J.W., Waldron, S., MacDonald, J.M., Ollinger, M.E., Nelson, K.E., Handy, C.R., Pozo, V.F., Schroeder, T.C., Antle, J.M.

MAJOR PART

At present stage the Russian Federation significantly yields to West countries in level of aggregate consuming of meat and meat products. Changes connected to crisis that happened in Russia within last decades led to drop of level and quality of life of country population. As result, average consuming of meat and meat products per person decreased (Fig. 1) and in 2014 it was only 52 kg (Houben, 2002).

Figure - 1
CONSUMING OF MEAT AND MEAT PRODUCTS FOR YEARS 2009-2014
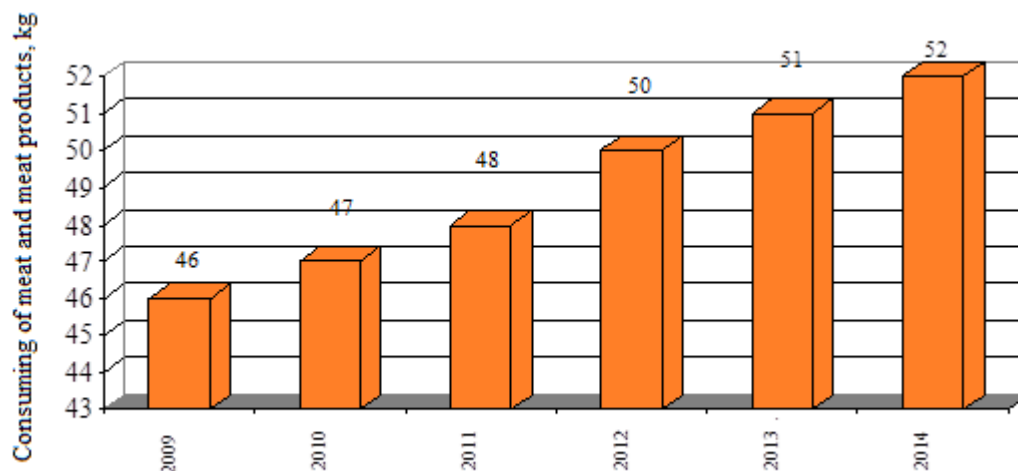
This index is 43-52% of European level countries, and 60% of recommended norm. Norm of meat and meat products consuming for one person per year is approximately 75 kg. Russia consumes meat and meat products almost 2 times less then USA residents and 3 times less than population of France, Germany and Great Britain.

According to marketing research of "Step by Step" agency, there are more than 1400 meat processing enterprises represented at market, among them nearly 200 are large. Leader by amount of sales is "Group "Cherkizovo": share of this company in RF market is approximately

20%, and its turnover in 2014 was 600 million USD. Nearly 10% of RF market is held by CJSC "Mikoyanovskii" with approximate amount of sales of 360 million USD. Further goes meat-processing plant "Tsaritsyno", meat-processing plant "Ostankino", then meat-packing plant "KampoMos" and "Klinsliy" (Manios et al., 2015).

According to data of Federal State Statistic Service, in 2014 the aggregate amount of meat and meat products production, including refrigerated meat and byproducts, was approximately 5 million tons (Fig. 2) (Stanciu et al., 2015).

Figure 2
PRODUCTION OF MEAT AND MEAT PRODUCTS FOR YEARS 2009-2014
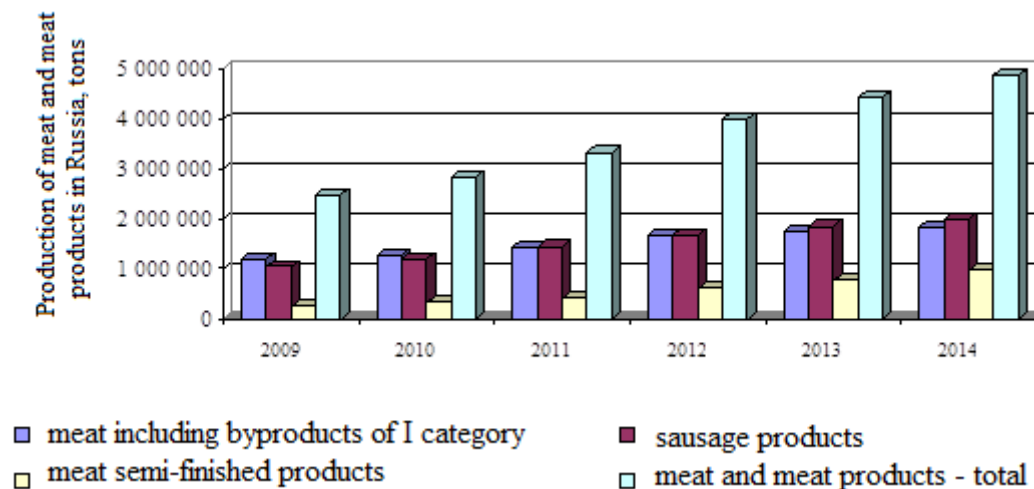
In 2009 a stable growth of domestic production of meat and meat products at significant drop of import incomes was taking shape, As data of Fig. 2 shows, amounts of meat and meat products production in years 2009 - 2014 increased for 96% from 2.5 million tons in 2010 to 4.9 million tons in 2014, at this amount of meat production increased for 54%, sausage goods for 81%, meat semi-finished products - in 4 times. (Adesokan and Raji, 2014)

Crisis state at market has ambiguous consequences for meat industry. Form one side, market prices for imported raw materials and production had drastically grown, but increase of competitive advantages of a large number of Russian manufacturers is also observed.

At present time a group of Russian markets leaders is formed in meat-processing branch and this is stipulated by appearance of first domestic brands at the market. Mostly these are Moscow enterprises: "Cherkizovskiy", "KampoMos", "Mikoyanovskiy". It should be noted that enterprises of "medium" level are also developing rapidly and hold stable positions at regional markets, which is the evidence of grows of investment attraction of meat-processing branch. Stable tendency of small manufacturers' number growth is the evidence of this too.

The most significant factor that impacts consuming of meat and meat products is the dependence of Russian meat-processing industry on import of raw materials. According to expert estimations, Russian needs import of 500-550 thousand tons of beef, 250-350 thousand tons of pork and approximately 1.4-1.5 million tons of poultry annually (Zulfakarova and Kundakchyan, 2014).

According to data of Federal State Statistic Service the share of imported meat is one third of total consumed meat amount (Zhou et al., 2012). Imported raw materials stay the most demanded resource for production of meat products by leading meat-processing enterprises of Russia.

In 2014 frozen beef was supplied in Russia by more than 20 countries. (Brown et al., 2002; MacDonald et al., 1996)

In Fig. 3 shares of major countries suppliers of frozen and refrigerated beef in 2014 are presented.

Figure 3
SHARES OF MAJOR COUNTRIES – SUPPLIERS OF FROZEN AND REFRIGERATED BEEF IN 2014 ARE PRESENTED
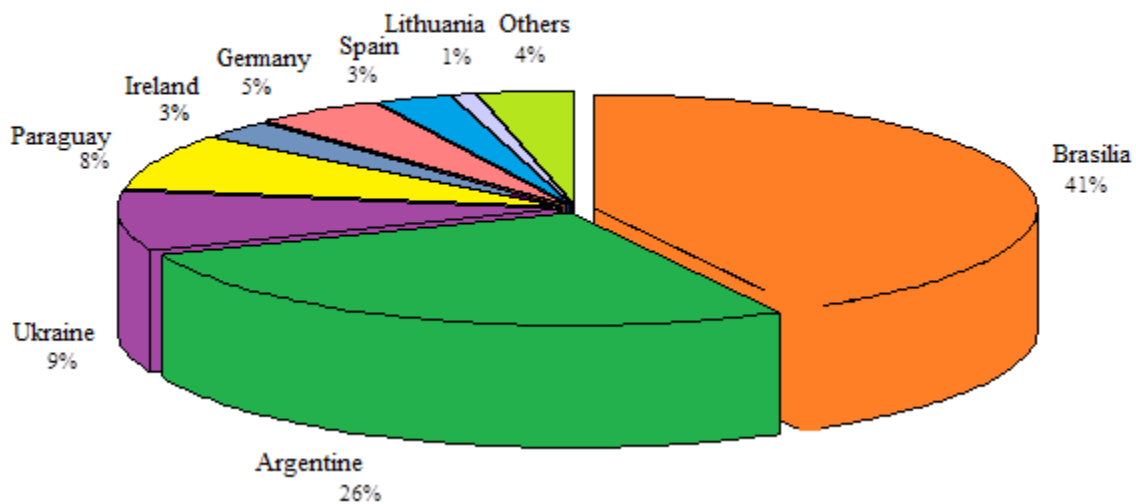
720.6 thousand tons of frozen and refrigerated beef for sum of 924.5 thousand UDS by average contract price 2.17 USD per 1 kg was supplied in Russia in 2014.

Analysis of data presented in Fig. 3 is the evidence of the fact that Brasilia share is 41%, Argentina - 26%, i.e. the share of major countries - suppliers of frozen beef in Russia in 2014 was 67% of total amount of supplies.

Formed tendencies on pork import are also ambiguous. In 2014 pork was supplied in Russia by more than 20 countries. In Fig. 4 the shares of major countries suppliers of pork are presented. A significant share in total amount of pork import belonged to Brasilia 70%.

Figure 4
**SHARES OF MAJOR COUNTRIES – SUPPLIERS OF FROZEN AND REFRIGERATED PORK IN 2014
ARE PRESENTED**
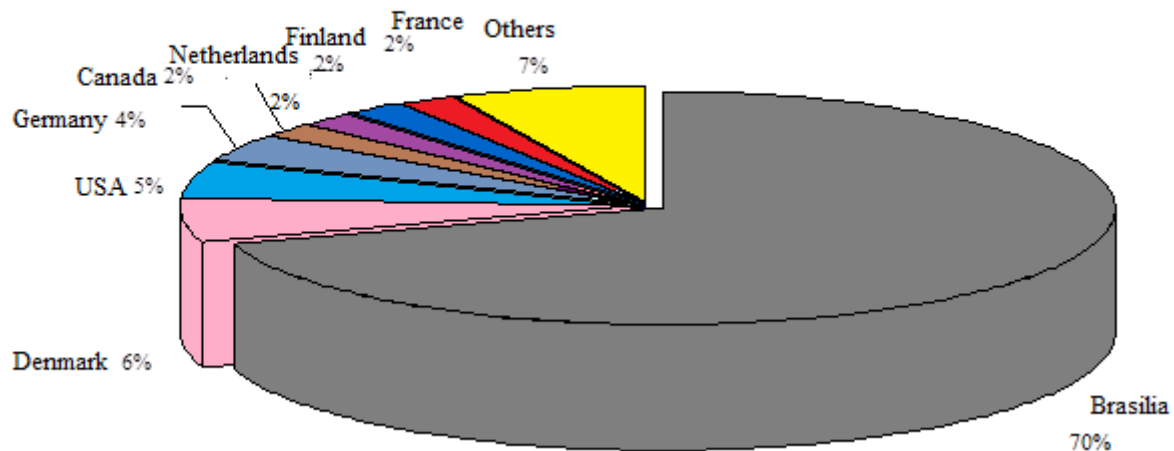
47.3% of frozen boneless pork, mostly intended for industrial meat-processing was supplied in general amount of import in 2014.

Starting from year 2009 the import of poultry grows rapidly. So, in 2010, relatively to 2009, import of poultry in Russia increased in 5.8 times. Restrictions and uncertainty in stability of poultry supplies that followed, led to shortening of import amounts. In 2011 amount of poultry import decreased relatively to 2010 for 3.2%, in 2012 to 2011 for 11.2%, in 2013 to 2012 for 8.1%.

In 2014 the share of the larges countries - poultry suppliers, USA (60%) and Brasilia (19%) was 80% of total import amount. 5% of poultry was delivered from France, and 15% from other countries.

Poultry is supplied in Russia in wide assortment. By product names and characteristics poultry has 25 types.

Let's consider the state of external economic activity of meat processing enterprises on sausage products.

Dynamic of export and import of sausage products in years 2009-2014 (Manios et al., 2015) is presented in Fig. 5.

Figure 5
DYNAMIC OF EXPORT AND IMPORT OF SAUSAGE PRODUCTS IN YEARS 2009-2014
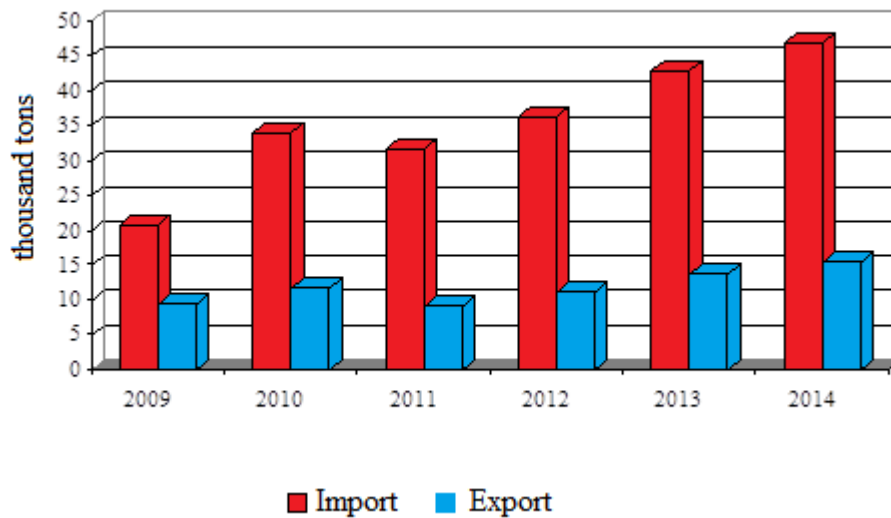
Analysis of Fig. 5 data shows that since 2011 the growth of export and import production amounts is taking shape. In 2014, relatively to 2009, amount of import increased for 19% and amount of export for 58%. Amount of sausage production import exceeded the export amount for 3 times in 2014.

Growth of imported sausage products amount can be explained by increase of population demand. Increase of export amounts is the evidence of the fact that production of a range leading Russia enterprises of meat-processing branch meets the ready market abroad, and domestic enterprises are forging connections with foreign partners on sales of their production.

Sausage products are supplied in Russia in diverse assortment. The most substantial share in import amount (55%) is held by sausage rolls and sausage links in vacuum package and also by cooked sausage products supplied from Poland, Finland and Germany (Stanciu et al., 2015).

Another type of sausage products supplied by import are uncooked smoked sausages and salami manufactures in Germany, Spain, Finland, France and Italy.

Liver pates in vacuum polymer sausage package, and also liver sausages are supplied from Belgium, Germany, Netherlands, Hungary and Lithuania.

According to data of Federal State Statistic Service, Russian agricultural manufacturers should simultaneously increase production of meat 2 times in order to provide a stable position of Russia in the market. However, according to approximate calculations, amounts of poultry production can be increased for 10%, pork production for 5%, beef production for 2% per year.

At the same time, in spite of introduced restrictions of meat import, domestic animal breeding is not capable of complete provision of Russian market: In recent years rates of meat production increase were insignificant, and cattle and pig stock is shortening in average approximately for 10% per year (Gerbens-Leenes et al., 2010).

CONCLUSIONS

In April of year 2012, in order to support domestic manufacturers and increase of local animal breeding profitability, in Russia were introduced quotas for meat importing from abroad. This immediately led to deficit of raw materials and drastic growth of meat production prices. In period since June of year 2012 prices of imported meat had grown for almost 20% (Fig. 6).

Figure 6
AVERAGE IMPORT PRICES OF MEAT
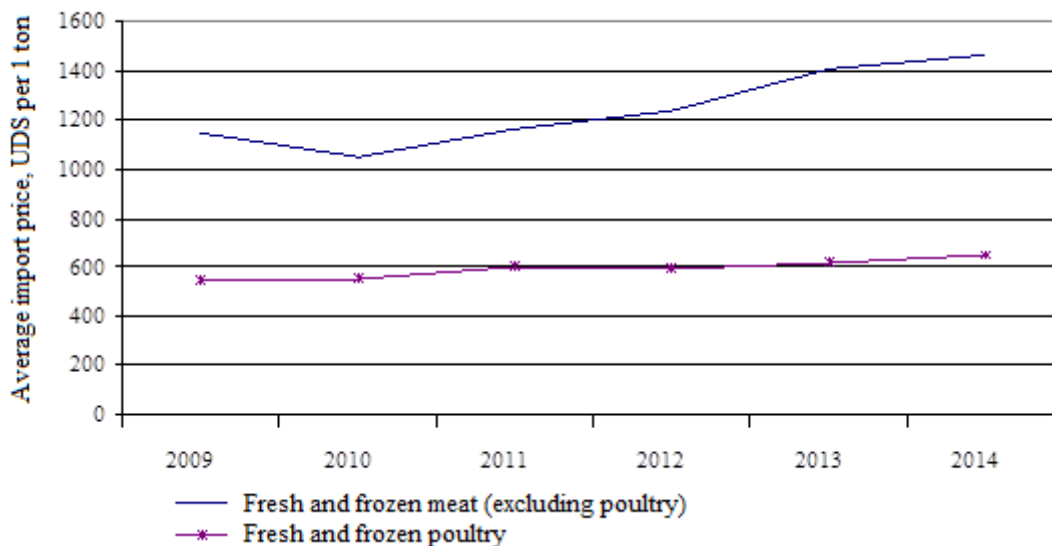
Within years 2009-2014 average retail price for all types of Russia sausage had increased almost 2 times. This is connected to growth of price for major meat raw materials, because for manufacturing of sausage production. Whereas in considered period prices for imported beef and pork had grown for 32%, poultry - for 24%, prices of domestic beef had grown for 112% and of pork - for 110%. Another reasons of sausage prices growth is the growth of inflation level that is especially noticeable at present time (Antle, 2000; Ollinger, 2011; Ollinger and Moore, 2008).

When diverse types of raw materials in 2014 became more expensive for 30-60%, products prices had grown for a little more than 20%. In spite of the fact that profitability is dropping, manufacturers are not able to rise the final price for their products, because this would lead to decrease of demand (Pozo and Schroeder, 2016).

Increase of raw material prices is threating by further decrease of meat-processing enterprises that is decreasing in recent years by itself (when two years ago it was approximately 15%, then now it is 3-5%).

Domestic manufacturers are increasing their share of market, growing their capital investments in pig breading and meat production. As for prices growth, the peak of "meat" inflation is already left behind. Pork prices had already reached their upper limit and even started to decrease under influence of shortening of demand for it. Also at present time the decrease of poultry prices is observed, and, therefore, the demand is re-oriented from pork to poultry. In

2016, in result of Russian poultry and pork production growth the competition will grow, leading to decrease of prices (Pozo and Schroeder, 2016).

Development of sausage production market would be in many ways determined by growth of raw material prices and purchase ability of population. In its turn, meat prices would be directly depending on introduced imported production quotas. A significant influence is conducted by high level of market competition.

SUMMARY

Therefore, long-term interests of state dictate the necessity of development of domestic meat-processing branch not only in order to suffice internal demand. but also to provide export supplies of separate meat production types in perspective. Stable development of meat-processing industry in Russia determines feed safety and life necessities of population in many ways.

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FEATURES OF THE TAXING IN THE INTELLECTUAL PROPERTY'S SPHERE

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ABSTRACT

This article is dedicated to essence of intellectual property objects in Russia for taxing purposes, and also to legal basis of intellectual property in tax legal relations. The most important objects of intellectual property for taxing purposes in Russia are considered. Intellectual property as an object of economic turnover is determined, the classification of intellectual property objects in economic aspect is given. Taxes that are paid by rights holder (resident and non-resident) of intellectual property object at creation and realization of such object are specified, existing allowances at taxing of intellectual property are listed. Peculiarities of taxing of operations with intellectual property objects as one of the most impartant issues at taxing of such operations, and also barriers interfering into development of innovation activity in Russia are considered. Inventive activity of population in Russia for years 2011-2014 is shown, namely the general number of patent application in Russia and number of applications by types of intellectual property objects, submitted by Russian and foreign applicants; sizes of share of internal costs of research and development in GDP of Russia and some foreign countries are also shown. Impact of tax policy on inventive activity is also considered.

Keywords: intellectual property, taxation, inventive activity, tax legal relations.

INTRODUCTION

At present time in the Russian Federation is conductive an active work on formation and improvement of legislation in sphere of intellectual property protection, including tax legislation. Today the market is oriented at harmonization of interests of state, economic entities and population, it requires reconsideration of coordination mechanism of their interaction, realized via taxing regulation.

In order to increase the number of entrepreneurs, ready to create and develop fields of innovations in Russia, the formation of beneficial climate for innovation business development, stimulation of investors' interest to this sphere and elimination of barriers interfering in effective innovation business development. Taxes should be a motivation of state and owners of intellectual property objects interests.

RESEARCH METHODS

Methodology of research is based on such general scientific research methods as comparing and analysis, synthesis. By their means was conducted comparing of regulations of Russian and international standards, and also critical analysis of diverse scientific points of view in regard of approaches to mechanisms of intellectual property objects taxing improvement in Russia.

RESEARCH RESULTS

To show that th major task of legislator is the coordination of state and tax-payer economic interests on basis of optimal taxation level with taking into account of population's inventive activity and specifics of intellectual property objects themselves.

As intellectual property is the exclusive rights for intellectual activity results, for purposes of taxation the latter should be related to property rights. At this one should keep in mind that property rights, in accordance to p. 32 art. 38 of Tax Code of the Russian Federation, are excluded from property concept applied in tax relations. Accordingly, intellectual property cannot be related to goods too, by sense of p. 3 art. 38 of Tax Code of the Russian Federation.

Material objects in which are expressed the intellectual activity results, can act as goods, but rights for intellectual property are separated from material carrier. Conveyance of property rights for material carrier of intellectual property object or right of material carrier ownership do not result by itself in conveyance of any exclusive rights for work expressed in this object.

Besides, intellectual property from taxing point of view also cannot be related to works and services, because the last are defined in art. 38 of Tax Code of the Russian Federation as activity of certain kind, while intellectual property is a property right for results of intellectual activity. This work has an indirect connection with intellectual property via results. However, intellectual property is not resolving itself to results of work, similar to the way it is not connected with material object in which are expressed results of intellectual activity too. Even further the intellectual property should stand away from services, because as the latter in order of taxation is acknowledged the activity which results do not have material expression, are realized and consumed in course of this activity conduction (p. 5, art. 38 of Tax Code of the Russian Federation). (Reider, 1993)

In spite of this at definition of taxation object in sphere of intellectual property in part two of Tax Code of Russian Federation certain digressions can be established. Nevertheless, the specific of intellectual property as object of civil rights should be completely taken into account in tax legislation, however, the concept of intellectual property for taxation purposes is not disclosed in Tax Code of the Russian Federation.

Increase of intellectual capital role requires thorough analysis of into formation sources, search and implementation of its intensive development. In activity of companies at front plan is advancing the problem of intellectual capital development, accumulation of organizational knowledge, detection, collection and spreading of information and experience, creation of preconditions for spreading and conveyance of knowledge. (Sukhanov, 2015; Sukhova, 2012)

Growth rate of internal costs for researches and development in Russia within last 15 years was in general outrunning the growth rate of GDP, except for years 2004-2005 when financing of researches and development was significantly shortened. By results of year 2011, the share of internal costs for research and development in GDP was 1.12% and was still below the maximum valued achieved in 2003 (1.29%). Imn international comparison Russia is at the level of Brasilia (1.19% in 2010) and Hungary (1.16% in 2010), substantially yielding to countries - innovative leaders (Germany and Japan - 2.82% and 3.26% in 2010, respectively), and also to Chine (1.7% of GDP). (The

Constitution of the Russian, 1993)

In Decree of the President of the Russian Federation of May 7, 2012 No. 596 "On long-term state economic policy" the task of increase of high-tech and science-driven economic branches production share in GDP to year 2018 into 1.3 times in regard of level of year 2011 was set for the Government of the Russian Federation.

In order of complete understanding of innovations' economic role let's consider inventive activity of population in Russia in years 2011-2014, and namely, the general number of patent applications in Russia and a number of applications by types of intellectual property objects, submitted by Russian and foreign applicants. (Povetkina and Shishkin, 2012)

In 2012 the general number of the Russian Federation patent applications received in Rospatent increased and was 44211 (106.7% in relation to 2011 – 41414 applications), including: (The Civil Code of the Russian Federation, 1994)

- the Russian Federation applicants had submitted 28701 applications which is 108.3% to year 2011 (2011 – 26495 applications);

- foreign applicants in 2012 had submitted 15510 applications which is for 3.9% more than in year 2011 (2011 – 14919 applications).

For issuing of patent of the Russian Federation for useful model were submitted 14069 applications, which is for 6.2% more than in year 2011 (2011 - 13241 applications), including:

- by Russian applicants – 13479 applications, which is for 7.1% more than in year 2011 (2011 – 12584 applications);

- foreign applicants in 2012 had submitted 590 applications which is 89.8% of year 2011 (2011 657 applications).

 For issuing of patent of the Russian Federation for industrial prototype in 2012 were submitted 4640 applications, which is for 10.5% more than in year 2011 (2011 - 4197 applications), including: (The Tax Code of the Russian Federation (part two), 2000)

- by Russian applicants – 1928 applications, which is for 0.7% more than in year 2011 (2011 - 1913 applications);

- from foreign applicants – 2712 applications, which is for 18.7% more than in year 2011 (2011 - 2284 applications).

 For registration of a trade mark and service mark of the Russian Federation in 2012 were submitted 61923 applications, which is for 3.6% more than in year 2011 (2011 – 59717 applications), including: (RF Government Executive Order, 2013)

- from Russian applicants – 34851 applications (2011 – 33252 applications), which is for 4.8% more than in year 2011;

- foreign applicants in 2012 had submitted 27072 applications which is for 2.2% more than in year 2011 (2011 – 26465 applications).

In 2014 the general number of the Russian Federation invention patent applications received in Rospatent decreased in relation to 2013 and was 40308 (89.74% in relation to 2013 - 44914 applications), including:

- from Russian applicants - 24072 applications (83.69% to 2013 - 28765 applications);

- from foreign applicants - 16236 applications (100.54% to 2013 – 16149 applications).

 For issuing of patent of the Russian Federation for useful model in 2014 were submitted 13952 applications (97.17% to 2013 - 14358 applications), including:

- from Russian applicants - 13000 applications (95.67% to 2013 - 13589 applications);

- from foreign applicants - 952 applications (123.80% to 2013 – 769 applications).

For issuing of patent of the Russian Federation for industrial prototype in 2014 were submitted 5184 applications (103.80% to 2012 - 4994 applications), including: (Saggi and Geng, 2015)

- from Russian applicants - 2200 applications (115.67% to 2013 – 1902 applications);
- from foreign applicants – 2984 applications (96.51% to 2013 – 3092 applications).

For registration of a trade mark and service mark of the Russian Federation in 2014 were submitted 61188 applications (94.24% to 2013 – 64928 applications), including: (Raju, 2008)

- from Russian applicants – 34174 applications (98.71% to 2013 – 34621 applications);
- from foreign applicants – 24646 applications (81.32% to 2013 – 30307 applications).

As can be seen from stated statistic data, the level of inventive activity was in positive dynamics in years 2011-2013. However in 2014 occurred slight decrease of inventive activity of population, both for Russian and foreign applicants.

Amount of registered patents shows the level of rights holders protection in the country. Within recent 15-20 years the level of inventive activity increased twice through the world, and by number of applications of patent registration Chine held the first place in 2011. (Gorskiy, 2013)

Intellectual property as an object of economic turnover is characterized in the following way: (Zorkin, 2014)

− it is a corporeal product in objective form of commodity;
− as commodity it has properties of public benefit; is characterized by non-decrease ion consumption and limited excludability;
− can be used both as a subject of consumption and as means of production;
− is both in private and in state property;
− has a capability to bring a profit;
− as means of production –asset of long-term use.

Besides, objects of intellectual property in economic aspect for purposes of taxation can be classified dependently on profitability: profitable object of intellectual   property   (bringing income in tax period) and non-profitable object of intellectual   property (not bringing income but having a potential for receiving of profit in future).

Taxation of received income from participation in intellectual property is performed directly at the level of its participants, which exclude double taxation, characteristic for entities, when initially received income is taxed at the level of corporate formation and then on the level of its stockholders (participants). (Panskov, 2013)

Russian legislation anticipates that every participant of intellectual property agreement have to pay profit tax from income received from participation in intellectual property independently.

Planning and conduction of export operations, for which intellectual property objects or results of intellectual activity are subject to, cause serious complications for Russian companies, striving to enter internatonal market. One of such complicated issues is, undoubtedly, the taxing of such operations, and first of all, the issue of volume added tax. (Pasko, 2012)

At conduction of operations between residents of Russia value added tax is accrued and paid in accordance to general procedure established by legislation of Russia. In case of provision of considered services (conduction of works), which place of realization is acknowledged the territory of the Russian Federation and tax payers - foreign entities not registered in tax bodies as tax payers, the tax base is defined as amount of income from realization of these services with taking of tax into account. Tax agents are obliged to calculate, charge from taxpayer and pay into budget the respective amount of tax independently on the fact if they are performing duties of tax payer related to calculation and payment of tax and other duties established by this chapter.

According to Russian legislation, the documents confirming the place of work conduction (service provision) are:

‒ agreement concluded with foreign or Russian entities;
‒ documents confirming the fact of works conduction (service provision).

On territory of Russian Federation from taxation by valued added tax are exempt operation on conveyance of exclusive rights for inventions, useful models. industrial prototypes, programs for electronic and calculation machines, databases, topologies of integral micro-schemes, production secrets (know-how) and also rights for use of intellectual activity results on basis of license agreement.

At this is important to note that at conveyance of rights for use of intellectual activity results by contracts of sale and purchase the exempt from taxation is not applied.

Besides, works on creation of intellectual activity results, conducted by agreement of sub-contraction, that are not accompanied by conveyance of rights for used of intellectual activity are subject to taxing by value added tax.

CONCLUSIONS

Practice shows that dependently in diverse agreement conditions, from which content is rather difficult to determine, what namely is sold, "a copy of a program" (commodity, disc) or one unit of complex property rights for software product, and also of determination which services namely were provided, courts estimate situation with value added tax in disputes of tax bodies and tax payers differently. Namely here is emerging the problem of complete and timely payment of taxes at realization of intellectual property objects, because not all intellectual property objects are subject to state registration as, for example, objects of author and related rights: photograph, poem, musical, scenario work etc.

SUMMARY

Therefore it is obvious that beside a large quantity of other barriers for development of innovative activity (refusal of business to develop risky directions of activity etc.) in Russia also exists barriers in form of tax system. In general the major goal of state policy is proclaimed to be a tax stimulation of innovations, but nevertheless a fiscal constituent of tax system continues to prevail over stimulating one (at this a large role is played by condition of taxation administration by territorial tax bodies).

We also should note that results received in basis of analysis by this method are applicable on case of absence of such significant distortions as conduction of protectionist policy, i.e. liberal regime of external trade is allowed and objects of intellectual property start to play one of the key roles in economic turnover. We also should note that there is an ability to

continue and extend this analysis, including in frames of separate spheres of activity, at condition of increase of information effectivity of Russian market.

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PROCESSUAL FEATURES OF CASES CONSIDERATION IN PRIZE COURTS (ON THE EXAMPLE OF THE PRIZE COURTS DURING THE RUSSIAN-JAPANESE WAR OF 1904-1905)

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ABSTRACT

The article discusses the formation, operation and special features of the prize courts, which were created by the warring states in their ports, for checking the legality of seizure of foreign vessels by its naval ships, made on the basis of prize law. The prize law is the set of standards, which is used by the prize courts for rendering the decisions. Prize law was developed no earlier than at the end of the XIII century. Since the end of the XV century, international treaties have begun to deal with the prize law, requiring from the warring sides speedy and fair judgments, setting a period for the decision of the case and reserving the right for appeal for neutral sides. The second half of the XVI century, XVII and XVIII century were marked by persisting and fascinating struggle between the warring and neutral sides, the last won, forcing the belligerent to recognize the freedom of enemy's goods under a neutral flag and to refuse from any extension of the concepts of blockade and contraband.

The prize law of the Russian Empire in XIX - early XX century is the subject of separate analysis. Its development and systematic use took place on a ground of Russian-Japanese War of 1904-1905. There are examples of cases, considered by the Supreme Prize Court.

Keywords*: prize law, prize courts, Consolato rule, seizure of a vessel, the prize.*

INTRODUCTION

Every war enables the warring parties to seize the enemy's property. The natural law for a long time was recognized as the basis of seizure, in consequence this study was refused, because the basis of seizure is utilitarian purpose: to deprive the enemy of warfare means in order to force it to the fastest conclusion of peace. Hence the belligerent derived their right to seize in the sea the enemy's war and merchant ships and to stop hostile trade. The property, taken from the enemy, is termed as the *prize*. However, in the literature of international law, the same points of view are not always expressed - what exactly is meant by the word "prize": whether it is a property that is only taken from the enemy, or whether it is a property that eventually pass into the ownership of the state-aggressor. In view of the fact that "the question of any captured ship (cargo) certainly is considered by the prize court, which may release the ship (cargo) from the capture, it would be more correct to call "the prize" only such property which has undergone a final condemnation, but in practice these concepts are often mixed, and every capture, made in the sea, is called the prize".

MATHERIALS AND METHODS

The prize law is the set of standards, which is used by the prize courts for rendering the decisions. Prize law was developed no earlier than at the end of the XIII century, because at the middle of it "seafaring men had neither the king nor the law, and what one could seize or take away, he called his own" (Matthew Paris). The first act, which dealt with cases of prizes, was - Consolato del mare, in some way it regulated marine war, giving protection to the neutral property; but it didn't concern the enemy's vessel with a cargo of the enemy. Consolato didn't mention about the prize courts, resolved, on the contrary, that the property seized in the sea became the property of the privateer, as soon as the last managed to take it to a safe location (intra pr a esidia). However, since the end of the XIII century, on the shores of the Mediterranean Sea, and in the XIV and XV centuries in Northern Europe, the legislative power of separate states, trying to subdue the pirates and corsairs, whose services as the privateer belligerents are used, certain legal norms, gives rise to prize law. (Lyushington, 1869)

The first example of prize regulation was given by Aragon. The statute, issued by Alfonso III in 1288, forbade the privateers to capture enemies' vessels during the truce and in international waters and ordered to bring the detained ships and cargo at that port, from which the privateers left, and the local court should to return illegally made prizes to the former owner; impartiality of officials was guaranteed by the prohibition for them to participate in armators enterprises and execution of statute demands for the privateer by the certain amount of contribution for ensuring the legality of their actions. About the same time, similar statutes appear in the urban communities of Italy (in 1298 - in Pisa, in 1319 - in Genoa), and later - on the northern coast of Europe: in Flanders, the Hanseatic League (1362-1364 recesses) - who had to endure persistent struggle with the pirates (Vitaliers), that finally disappeared only in the XV century (1433), - in the Netherlands (1487). Therefore, since the XV century, prize law has become the part of International Law. Prize courts were the national courts of privateers and neutral states had to admit their jurisdiction for all prize cases, according to the rule of actor forum rei sequitur.

Since the end of the XV century, international treaties have begun to deal with the prize law, requiring from the warring sides speedy and fair judgments, setting a period for the decision of the case and reserving the right for appeal to neutral sides. The second half of the XVI century, XVII and XVIII century were marked by persisting and fascinating struggle between the warring and neutral, the last won, forcing the belligerent to recognize the freedom of enemy's goods under a neutral flag and to refuse from any extension of the concepts of blockade and contraband. (Martens, 1869)

In international treaties of the end of the XVIII century, high position was held by judgments concerning judicial evidences (the North American States treaties with the Netherlands in 1782, with Prussia in 1785, with Britain and France in 1786), and the prize form of proceedings (the same treaties and the treaty of Genoa with Denmark in 1789; the last contains not repeated in other treaties resolution, according to which protection of the interests of the neutral owner before the prize court, rests on the consul and in case of conflict between the evidences of privateer and neutral side the preference should be given to the last. Since the end of the XVIII century, the United States of North America has outstanding impact on the development of prize law, in favorable meaning to neutral trade. They accepted from their mother country all the institutions of the prize law, but rejected the interpretation of the British Prize Courts, as disagreed with international law.

At the beginning of XIX century, the prize law was a mixture of two different principles. On the one hand, the seizure of vessels was performed with the use of principles, proclaimed in the famous Catherine's declaration of 1780; on the other hand, the ancient Consolato rules remained in force. The Marine Convention from 5/17 of June 1801, drawing between Russia and Britain, repeated the resolution of the medieval body, concerning the capture of the enemy's property on neutral ship. Although the Convention makes the reservation that if the goods "growing or handled" in a hostile country, are purchased by neutral sides and carried at their expense, they should not be confiscated, but the general principle, established by the convention, states that the enemy's property is subject for seizure on a neutral ship. This principle, including to the treaty at the insistence of Britain, corresponded to entire British trade policy, that sought to prevent the strengthening of the neutral sides at the time, when England was occupied by the war with opponents. (Ovchinnikov, 1897)

There was no guiding principle, on the basis of which it was possible to determine the prize law at that time. Or, rather, it was, but its essence resolved not into weakening of the enemy and its trade, but into full abolition of neutral maritime trade. Such an approach completely perverted the concept of war. Therefore, the right for seizure has the character of cruel injustice. England openly violated its own rules in an effort to keep naval superiority and to create the world domination for its trade. Forbidding neutral trade with the enemy ports, England gave out special permissions (licences), on the basis of which British merchant ships could break the blockade of the French coast.

RESULTS

The prize law of the Russian Empire in XIX - early XX century is the subject of separate analysis. Its development and systematic use took place on a ground of Russian-Japanese War of 1904-1905. Of course, the prize courts also functioned during the First World War, but this side of the Russian prize practice has not been saved and therefore could not be investigated.

A new law on "Prizes, made by military courts", consolidated by the Imperial Court on July 10, 1806 was issued in the reign of Emperor Alexander I. Marine war, that preceded the publication of the law, showed a discrepancy of previous decisions, concerning the prizes, to the changes that have occurred both in the shipbuilding and in the methods of estimation of the real forces of captured ships, and also in terms of international law. The development of international life and international relations, the capture of prizes in distant waters, the debate on this subject with the neutral governments, and a number of claims from neutral sides, complaints to the Admiralty Board, and to the Imperial Name everything led to the need of revising the current regulations. The Articles of the Navy Regulations on brining the prizes to Kronshlot and on carrying out the investigation by the port commander were not used for the prizes, captured in the Mediterranean Sea. At that time, the law should be certainly changed, to determine exactly where the captured prizes should be sent, and what withdrawals could be in this case. Improving of marine gunnery, forced to take as the basis of prize assessment not the caliber of guns, but the number of metals ejected from the vessels. (Reports of the Supreme Prize Court for the cases of Russian-Japanese War of 1904 and 1906 with an overview of the activities of Russian Prize Courts, 1913)

The Act of 1806 mainly concerns the judgments of financial prize law. In the first two articles, it determines the correct prize as the any gains, acquisition or appropriation of the

enemy's property, and for the taking of such a prize it requires only using open force or permitted stratagems, but not resorting to perfidy.

The second part of the law of 1806 is devoted to the question of merchant prizes both the enemy's and neutral. The confiscation of these vessels is permitted only by the decision of the prize court, or, as the law says, the prize committee. The procedure prescribed to the cruiser, is the following: having captured the enemy's ship, its hatches must be locked, sealed and a guard must be set to protect the seals and surveillance for the rest of the ship's property. If the merchant's prize is given to the Russian port, the main port commander, the prize committee and the customs should know about it. Port authorities or prize commission conduct a survey of the crew of the captured vessel and take away all the papers about the vessel and cargo. The products, in the presence of port and customs officials, as well as in the presence of those individuals who took the prize, are unloaded from a vessel, then placed in stores and sealed by their seals. The ship and cargo, stacked in stores, can be sold by the person who took the prize. But just when this sale is allowed – there is no precise instructions. (Lushington, 1866)

Meanwhile, the Act of 1806 adheres to the old definitions of Consolate del Mare, prescribing to consider the enemy's cargo on the neutral ships as the right prize, and to release the ships. But not just any ship, having neutral flag, can use this freedom. If the crew of the ship consists of more than one-third of enemy's nationals, or if the goods holder, the commissioner or confident of the enemy's naval authorities are on the shipboard, such vessel is considered as the right prize, despite the fact that it has a neutral flag. However, more detailed rules about the capture of neutral vessels, the law allows to explore in regulations for certain superiors, depending on the particular conditions of the war and on the status of political relations between the States concerned. In conclusion, talking about the fact that the case of the seizure of the merchant's prize necessarily must be considered by the prize commission, the Act of 1806 gives this commission rather administrative character than judicial. Article 42 states that the question of the prize should be considered by "the prize committee or other authorities at the port." Therefore, the judicial character of the prize committees is ignored.

This is the main essence of the Act of 1806. This Act had a force of the main prize law, until the issuing the Regulation on Maritime Prizes in 1895. Meanwhile, a goal that was pursued in its drafting, was to replace outdated Peter definitions, concerning the assignment of a prize and distribution of prize shares. Therefore, despite the issuing of the Act in 1806, during the XIX century, there was no single satisfactory prize statute in the Russian Empire, and each prize question was a matter of extreme difficulty in its solution. Not to mention the Crimean War of 1853-1855, when the unsatisfactory condition of the prize law forced the Marine Ministry to appoint a commission to draw up a new position.

And only in spring of 1890, a new draft of "Regulations on Maritime Prizes" was drawn up and sent to the chief commanders and flagships for preliminary consideration. And in March of 1894, after further editorial changes, the draft of "Regulations on Maritime Prizes" was introduced to the Admiralty Board, which, making some corrections put it to submit for legislative approval in due course. In August of 1894 the project was submitted to the State Council and after the conclusions of the United Departments and the General Assembly of the State Council, the project was corrected in some parts for greater accuracy therein regulations and on March 27, 1895 the highest approval of the new "Regulations on Maritime Prizes" was carried out.

As noted above, the Regulations on Maritime Prizes of 1895 has found its first significant application during the Russian-Japanese War of 1904-1905.

During the Russian-Japanese War, Port Prize Courts were established for dealing up with maritime prize cases, first in Vladivostok and Port Arthur, and then in Libava. In accordance with the Article 52 of the Regulations on Maritime Prizes, each of these courts consisted of one chaired person who served on the Naval Department of Justice, two members from the Ministry of the Navy, two members from the Ministry of Justice and one member from the Ministry of Foreign Affairs, and each of them had especially assigned Prosecutor and Registrar.

In a short time after beginning of the war, the Supreme Prize Court was formed and consisted of the Admiralty Board members, including Comrade Minister of Marine (presented on the rights of members of the Board), two Senators of the Civil Cassation Department of Governing Senate and one member from the Ministry of Foreign Affairs, in accordance with the Article 57 of the Regulations on Maritime Prizes, under the chairmanship of the Ministry of Navy Commander or Marine Minister. The Legal Counsel of Marine Department functioned as a Prosecutor, and the Record Manager of Marine Department fulfilled the duties of the Secretary.

Considering the cases over the marine prizes during this war, the Port Prize Courts finally solved only the cases of arrest and seizure of two Japanese vessels and 19 Japanese schooners.

All other cases, concerning the vessels of neutral nationality or their cargoes, reached on appeals to the consideration of the Supreme Prize Court. Exclusive and only a partial exception in this regard is the case over the German steamship «Tetartos», according to which only complaint about the confiscation of the cargo, which was on that ship, reached to the consideration of the Supreme Prize Court; the vessel was considered to be released, and the loss of its sinking should be reimbursed by Libava Prize Court.

The following cases, considered by the Supreme Prize Court are the most significant; they largely focused on the review of decisions of the lower prize courts.

The first case, reached to the consideration of the Supreme Prize Court, was the case over the complaint on the decision of the Vladivostok Prize Court over the confiscation of the English steamer «Allanton» with a cargo of coal. The Supreme Prize Court recognized that the steamer «Allanton» and its cargo were detained for about an adequate, but were not the subject to confiscation, it quashed the appealed decision of Vladivostok Prize Court by the judgment from 9 October 1904 and decided to return the vessel and its cargo to respective owners.

The second case was a complaint against the decision of the Vladivostok Prize Court over the confiscation of the English steamer «Cheltenham», detained on June 19, 1904 by a detachment of cruisers in the Sea of Japan, while the carrying to the Korean port Fusan the cargo of railway materials for the Seoul-Fusan railway. The fundamental question on this case was whether the carrying of war contraband to the Korean port of Fusan considered as trafficking to the enemy port. The Supreme Prize Court upheld an appeal over the decision of the Vladivostok Prize Court without affecting the decision on the 18 of November 1904. In this respect, the decision of the Supreme Prize Court would be also justified from the point of view of the later London Declaration (Articles 30 and 35), which consider the carrying of war contraband to the territory occupied by the enemy, as the territory belonging to the enemy.

The third case is the case of the German steamship «Thea», which was arrested on the 12 of July 1904 and was sunk near the seashores of Japan. On appeal for the decision of the Vladivostok Prize Court over declaration this ship as a liable to confiscation, main question was, whether the use of the neutral nationality vessel for hire by the enemy's trading company and coastwise navigation between the enemies' ports considered as a violation of neutrality, entailing the confiscation of the vessel of neutral nationality. The Supreme Prize Court found that according to the exact meaning of the Articles 8 and 11 of the Regulations on Maritime Prizes,

neither the use of the neutral nationality vessel for hire by the enemy's trading company, nor its coastwise navigation between the enemies' ports do not constitute a violation of neutrality, entailing the confiscation of the vessel, and due to this decided to recognize that the German vessel «Thea» was not a subject to confiscation and detention by the decision from 20 of November 1904; but it upheld the part of the case of Vladivostok Prize Court concerning the confiscation of the goods, because it was not appealed. Several years later, after making this decision, the Supreme Prize Court considered another three complaints over the same steamer «Thea» and its cargo.

The next case is the case concerning the English steamer «Knight Commander», detained and sunk on July 11, 1904 in Tokyo Bay. One of the most important principle issues was a filed in this case, namely, the permissibility of the sinking of detained vessel of neutral nationality. This question was started initially in the diplomatic correspondence, where the British Government, protesting against the admissibility of the sinking of the neutral nationality vessel as dissenting with the principles of international law, in his opinion, indicating, at the same time, the fact that in this case, not the Court, but the naval officer-in-charge would consider the case, and the legitimate interests of the owners of innocent subjects would suffer. Russian Government, for its part, expressed, that of course, the destruction of the detained vessel of neutral nationality should not be allowed out of emergency as provided in the Article 21 of the Regulations on Maritime Prizes, and without complying a special care.

DEDUCTIONS

Giving the examples of decisions, considering the Prize law of the Russian Empire, we can make the following conclusions about the procedural peculiarities of prize cases. First of all, talking about the prize courts, it is necessary to talk about semi administrative bodies, which are temporarily valid for the period of military operations in the sea. This conclusion can be drawn from the analysis of the composition and order of the establishment of prize courts.

The consideration of cases in prize courts involves the simultaneous application of the national law of the country, on the basis of which the prize court acts, as well as established at that time international maritime law. In addition, in rare cases, the courts have been forced to turn to the legislation of a neutral state, the owner of the cargo or the vessel.

In the process of making decisions and hearing the cases in the prize court, functioning procedural law, namely the Statute of Civil Procedure was partially used. So refusing the repeated appeals for the case of the steamer «Tetartos», the court refers to the Articles 893-895 of the Statute of Civil Procedure, indicating that the second appeal on the issue is not possible, even in the case of a claim from another person, since the credibility of the decision on the merits.

CONCLUSIONS

Considering all the cases of the Supreme Prize Court is not possible, so giving the examples of these decisions we reveal the main features of the activities of this judicial authority. Of course, the question on the activities of Russian Prize Commissions and Courts is absolutely unexamined by science.

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RECEPTION OF THE ROMAN LAW IN MODERN BUSINESS ACTIVITY

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ABSTRACT

The issue of reception of Roman right in modern business relations is considered in this article. In result of research is summarized that legal definition of business activity includes the experience of establishing and development of economic activity of civil turnover subjects via its legal confirmation. Authors had conducted the analysis of business activity's legal definition, its major and additional signs are detected. Namely by virtue of jus privatum and development of private property institute, acknowledgment of legal equality of private legal relations subjects, the economic relations, similar to those that today are falling into concept of business activity, started to develop in Ancient Rome. Analysis of listed major features (signs) of entrepreneur in aggregation with definition of business activity confirmed now in Russian civil legislation allows to conclude that stated features, justly noted by by researchers in sphere of economic, found their confirmation and reflection in modern legal definition of business activity. It appears that necessary signs characteristic for modern business activity are possible to be detected in economic activity of Roman citizens too.

Keywords: reception of Roman law; business activity; signs of business activity; ancient Romans entrepreneurs.

INTRODUCTION

In period of reformation of civil legislation, in order to develop effective mechanism of legal regulation of development of civil turnover capable to protect interests of its participants via increase of their productivity, we more and more frequently wonder about sources of understanding the category "business activity" and its essence. On our side, we are persuaded that research of this problematics, from author's position, would contribute a new rational kernel into civil jurisprudence, and would represent the interest both for specialists in sphere of civil and business law, and for practicians. In this connection we believe that actuality of our survey does not cause any doubt.

Today the statement that entrepreneurial activity is a type of economic activity aimed at extraction of profit on conditions formed by society and state is already a dogma. In spite of the fact that according to official data the term "entrepreneur" was used for the first time in year 1723, and forefathers of entrepreneurial relations development theory were economists Richard Cantillon and Jean-Baptiste Say (http://www.ereport.ru/articles/firms/entrepreneurship.htm), already Aristotle before Christ designated the ability to keep the house and entrepreneurship as art (Aristotle, 1992). Therefore, a conclusion can be made that the rudiments of activity considered today as a business one, emerged already in bowels on ancient economic. And the bloom of ancient entrepreneurship falls to period of classic Roman law. Namely by virtue of *jus privatum*, development of private property institute and acknowledgment of legal equality of

private legal relations subjects, the economic relations, similar to those that today are falling into concept of business activity, started to develop in Ancient Rome. Let's try to speak in favor of our conclusion. In order to do this, we will consider signs characterizing this activity in more details.

MATERIALS AND METHODS

The article has theoretical, comparatively-legal nature, there are observations, definitions and estimation of signs of modern business activity and also economic activity of ancient Romans are given.

General scientific methods are also used: logical, analysis, synthesis.

Statutory acts of Russia and Ancient Rome and also positions of leading civil lawyers and scientists in sphere of Roman private law are laid in the basis.

RESULTS

We will start our survey from worthy of attention and grounded in our opinion sayings of well-known researchers of economic processes: A. Smith, D. Riccardo, R. Cantillone, A.D.P. Taylor, J. Schumpeter who formulated basic features of entrepreneur, such as: 1) readiness to risk; 2) relaying on own forces; 3) striving to personal enrichment; 4) inclination to experiments; 5) realization of meaning of his efforts for prosperity of society in general. Undoubtedly, all these qualities are inherent for both modern entrepreneur and ancient one, who acted in order to preserve and multiply the family property, at his own risk and peril, sometimes concluding deals that were not even anticipated by standards of *jus civile*.

Analysis of listed major features (signs) of entrepreneur in aggregation with determination of business activity confirmed now in Russian civil legislation allows to conclude that stated features, justly noted by by researchers in sphere of economic, found their confirmation (to more degree) and reflection in modern legal definition of business activity (art. 2 of CC RF (Civil Code of the Russian Federation; 2001)). This is an independent activity performed at own risk, directed at systematic receiving of profit from use of property, sales of goods, conduction of works or provision of services by persons registered in this quality by procedure established by law.

For purpose of arguments of our suggestion about the fact that economic activity performed by ancient Romans falls into modern definition of business activity, let's separate a range of signs, inherent to it, from definition established by law. At this should be noted that in scientific literature are usually distinguished basic signs, directly subsequent upon the established formulation, and additional (facultative) that are the result of business activity as social, economic process (activity) (Russian business law: textbook, 2008).

Therefore, the major (mandatory) signs of business activity are: 1) independence (independent nature of activity); 2) risk nature of activity (connection to risk, activity connected to risk); 3) orientation at profit receiving; 4) systematicity; 5) profit received us a result of use of property, sale of goods, conduction of works or provision of services; 6) legitimacy (business activity can be performed by persons that are registered in this quality by procedure established by law).

To additional signs of business activity should be related: 1) professionalism; 2) innovation nature; 3) property responsibility of entrepreneur; 4) initiative nature; 5) commercial orientation. At this the signs stated, as we suppose, are facultative and stipulated by modern stage

of society and state development (connection of successful business activity with use and implementation of modern approaches and technologies). In connection to this appears that the list of signs following the legitimate definition of business activity would stay unchangeable, and among the facultative signs the emergence of new ones is possible.

So, let's consider mandatory signs inherent to business activity in proportion with possibility to detect them in economic activity performed by Roman citizens.

The first of major signs of business activity, marked earlier, is independence. At this, in practice the independence of business activity conducted is expressed both in property and organizational plan. Existence of separated property, some economic base used for business purposes in possession of entrepreneur is understood under property independence. Organizational independence supposes independent decision making by entrepreneur, independent selection of type and method, organizational and legal form of business activity conduction, participation in such relations in own name, separation of subject of business activity from other entrepreneurs and state in general.

In this case the state, being regulator, establishes rules of work, regulates the process of business activity conduction without interfering in activity of economic subjects. In its turn, any business activity is a social activity; in this connection it should meet the requirements of social standards that are functioning in this society. For purpose of justice we should note that these signs were inherent to Roman "entrepreneurs" too. A fully legitimate subject of *jus privatum*, capable to conduct independent economic activity, conclude deals, was a person endowed by three legal conditions: *status libertatis, status civitatis, status familia.* At this the presence of the latter was predetermining the ability of a person, among others, to own family property by right of ownership and manage it, conducting one or another deals. Accordingly, the complete deal-ability was endowed to persons owning a separate property; this endowed them by ability to conduct one or another deals independently and bear property responsibility by them.

In regard of organizational form of economic activity of ancient Romans, *jus privatum* provided them the opportunity to conduct both independent activity by forces of their family, slaves included, and organize via conclusion of agreement of societas (partnerships) or creation of unions of physical entities, reminding modern legal entities by their features. Therefore, as we can see, the first sign characterizing the business activity was inherent to economic subjects of *jus privatum*.

The next sign of business activity is a connection with risk. In other words, such activity has a risk nature, anticipating possibility and menace of non-achievement of planned and anticipated results, In connection to this can be said that by conduction of business activity the entrepreneur acts at his own peril.

Well-known researchers of economic processes, K. McConell and S. Brue disclosed the entrepreneurship as a peculiar type of activity, in which basis, among others, lies the characteristic of entrepreneur as a man taking risk. In connection to this is noted that entrepreneur risks not only by his business reputation, labor and time, but also by invested funds, both his and his companions. In this connection at contemporary stage of development of business relations, business processes in organizations is actual such constituent component as detection and development of the most suitable methods and manners of relieving and reducing of risks. This stipulated the emergence of such directions of activity in sphere of entrepreneurship as: risk management, management of risks (Stein, 2004). A bright example of risk activity conduction by Roman citizens are *pactio nuda*, "naked deals", not equipped by remedies (Sanfilippo, 1996). Non-formal agreements, not acknowledged by law were

acknowledged as such. There were not much kinds of contracts (formal agreements), acknowledged by law. However, fast development of trade, manufacturing, agriculture requires from "entrepreneurs" of Ancient Rome prompt actions on conclusion of agreements that initially did not have remedies by *jus privatum*. Risking by their property, non-receiving of property benefit and profit, ancient Roman were concluding such agreements at their own risk and peril. Only at later stage the praetor started to provide the remedy to some of such pacts, thus "dressing" them (*pactio vestita*).

One more mandatory sign of business activity is systematic receiving of profit. In our case the profit has to be considered as a major objective of business activity. It is imagined that from the point of view of the developed in theory of law and received in civil jurisprudence theory of stimuli and limitations, the enrichment of economic subject has to be considered in this case as some stimulus prompting for active actions in business sphere. At this, as was already noted, the state provides the ability and freedom of business activity conduction and, accordingly, receiving of profit on legal basis. In this case the profit is considered as the major stimulus of economic activity of economic subject, then such signs as risk nature, independence, legality (and others) should be regarded as limitations of a certain type. (Ershova and Othyukova, 2008)

From the law point of view, according to p. 1, art. 247 of Tax Code of RF, under the profit are understood received income, reduced for amount of expenses conducted (Tax Code of the Russian Federation, 1998). In its turn, under the income is acknowledged the economic benefit in monetary or natural form, taken into account in case of possibility of its estimation and to that degree in which such benefit can be estimated, and defined in accordance to provisions of TC RF. At this is necessary to note that the goal of profit receiving is a qualification sign at relating organizations to (dividing into) commercial and non-commercial.

Our speculations about income and profit also have a direct relation to the subject of survey. We don't think that organization of economic activity of ancient Romans was pursuing any other goal. It's not a coincidence that one of elements of property law content was *jus fruendi*, a right for fruits and income. At this, initially this authority was an independent authority of owner on receiving fruits and income from the item. And only at later stage this authority became a constituent part of authority of use, *jus abutendi* (Mousourakis, 2012).

Regarding the systematicity of business activity conduction, in scientific literature is justly noted that systematicity is expressed in public proclaiming of a businessman to act in accordance to certain rules. It is noted that with systematicity should be connected not so much as continuity of actions conduction, but stability of businessman's intentions. Systematism should be understood as recurrent repeating of something. In connection to this the systematic receiving of profit means the recurrent receiving of profit. Namely the systematicity of income receiving should be acknowledged as the key for successful business activity.

Legally confirmed definition of business activity comprises a pointing at possible directions (methods) of business activity conduction. It is noted, in particular, that the profit is extracted by subjects from use of property, sale of goods, conduction of works or provision of service. Such confirmation of business activity in CC RF allows to suppose that in this way the major types of activity conduction found their reflection at legislation level. Along with this appears that thus formulated sign of business activity is a bit incorrect.

In this connection in civil jurisprudence and science of business law is justly noted that modern business activity is multi-fringed, and in forming market economic its directions cannot be represented by closed list in any way. It appears that in frames of CC RF and legal definition

is not rational to confirm and list all possible directions of business activity, because they are stipulated by market, depend on degree of development of economic and state in general. A similar conclusion can be made in regard of "business activity of Ancient Rome", because with development of state and extension of its borders, involvement of new subjects in economic turnover, the economic of Ancient Rome was developing too. The most developed spheres of Ancient Rome economic were agriculture and also craft activity, particularly at processing of metal, stone, leather, wool, pottery, ceramics production, weaving etc. On one side, agreements concluded in Ancient Rome and equipped by remedy had an entire nature, However, on the other side, such agreements were deficient and Roman kept founding new ways of economic activity development (Buckland, 2012).

Next sign, a result of article 2 of CCRF, is legitimacy of business activity, expressed in the fact that such activity is conducted by entities, registered in this quality in accordance to procedure established by law. The considered sign, in our opinion, should be understood in more extent, ambiguous manner. First of all, this means that in order to conduct business activity the subject should receive a particular status, i.e. select a legally confirmed organization and legal form of business activity conduction (i.e.. to conduct the activity either in form of commercial organization, or in form of individual entrepreneur) and undergo the procedure of state registration itself. And second, this sign should be considered as an accompanying condition of business conduction, i,e, its should be conducted in frames of requirements of current domestic legislation, in frames of law field (with adherence to requirements of civil, business, tax, administrative, criminal and other legislations).

CONCLUSION

Therefore, as our research had shown, characteristic features of business activity was developed by time. Dependently of era and level of economic, the definition "business activity" was filling with new content. However, its features were already expressing themselves in activity of Ancient Rome citizens. And we tried again to prove what impact has the Rome private law on modern development of civil turnover.

CONCLUSION

Therefore, we are approaching to the main point of out research: legal definition of business activity includes the centuries-long experience of establishing and development of economic activity of civil turnover subjects via its legal registration.

CONFLICT OF INTERESTS

Authors confirm that above provided data do not contain conflict of interests.

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EFFECTIVENESS OF STATE REGULATION OF INNOVATIVE ACTIVITY IN RUSSIA

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ABSTRACT

In article is conducted the analysis of performance of state regulation of innovative activity in Russia. The estimation of this process by two interconnected directions is presented: creation of clusters and realization of state programs. Analysis of clusters' development had shown that the growth of expenses for R&D and investment costs of clusters' participants occurred mostly by cost of budget funds. Private funds are used in extremely small amounts. The conclusion is made that the potential of clusters acting as effective mechanism of direct foreign investments attraction and integration of Russian clusters into the global market of high-tech production is not used to adequate degree. Analysis of effectiveness of state innovation programs realization demonstrates the tendency to decrease which is stipulated, in our opinion, by crisis phenomena in global and Russian economic, and is a result of emphasis on qualitative parameters of state regulation to the detriment of qualitative characteristics.

Keywords: innovation, government regulation, efficiency, effect, state programs, cluster.

INTRODUCTION

Realization of state politics in the field of development of researches and nanotechnologies is first of all aimed at effective functioning of integral, capable of reproduction and self-development national innovation system, including both scientific-technical and production-technological spheres of economic, oriented at intense development and production of goods and services, competitive in the global market.

While characterizing the innovative activity as highly risky and of increased degree of complexity, scientists Shichiyakh, R.A., Tolkacheva, S.V., Shkiotov, S.V., Borlakova, M.I., Zyablov, A.A. are paying special attention to insufficiency of internal stimuli in Russian business sector. In their opinion, the system of motivation for conduction of innovations by Russian business should be laid by measures of state impact. (Shichiyakh et al., 2016)

Generally it should be noted that this point of view is rather widely spread among Russian scientists. In this regard the concept "forcing to innovations" was reduced to measures of state administrative impact, mostly at representatives of big Russian business. Without analyzing this we wish to note that contemporary researches (Institute of management of innovations SRI HSE, Russianventure company) of performance of state measures of big Russian business motivation in conduction of innovations lead authors to the following conclusion. "Managers of innovations...are working, firs of all, in state corporations... on creation of image of innovativeness for reduction of risks of administrative impact" than on break-though innovations themselves. (Saraev, 2013)In research of social-economic and industrial development of countries in post-crisis period Vertakova Yu. and Plotnikov V. are convincingly proofing that the

developed industrial potential of innovationsto significant degree promotes the stability of economic in crisis conditions. (Vertakova and Plotnikov, 2016)

Furthermore, scientists had established that innovative politics in post-crisis period should act as one of priorities of state regulation of economic. Authors had shown the need of "new industrialization" in a range of countriesthroughout the world on basis of innovation technologies implementation into manufacturing.

At this activation of innovative activity in the country requires from state the formation of conditions for respective institutional environment. Economists Podmolodina, I.M., Voronin, V.P., Konovalova, E.M. are relating it to the first-turn formation of the following mechanisms: improvement of conditions for just competition and increase of companies' motivation for innovations; development of technical regulation system that includes coordination of legislation base of Russian and countries of EC in scientific-technological sphere; simplification of procedure of new products entering into market; simplification and acceleration of certification procedures, including in regard of international quality standards; simplification of technologies import mechanism; strengthening of requirements to effectiveness of use of natural resources enterprises, safety of production (services) for ecology and health of population, reduction of energy and material consumption; development of respective bonuses and sanctions system, harmonization of Russian standards with international, particularly in directions that are characterizing perspectives of extension for export of innovative products. (Podmolodina et al. 2015)

Foreign researchers are frequently considering issues of effectiveness of innovation state regulation means as related either to specific sector of economic or spreading of certain technology.

In researches of Chang, R.-D., Soebarto, V., Zhao, Z.-Y., Zillante, G. are analyzed laws, politics and rules of functioning of innovation sector in the country. (Chang et al., 2016) Authors come to the conclusion about greater significance of such means of innovations state regulations as statutory-legal provision and control, and also creation of respective economic stimuli in entrepreneurial sector. In particular, results of analysis of construction branch participants behavior in China had shown that it is necessary to apply grant politics in innovation politics of state more actively, take measures on increasing of standards and estimations in field of impact at environment.

A similar research was conducted by Stucki, T., Woerter, M. considering the way diverse types of state politics, directly and in combination, impact at quantity of energetic green technologies produced by enterprises. (Stucki and Woerter, 2016) Using data on spreading of ecologically pure energetic technologies in 1200 Switzerland companies and having constructed econometric model, the scientists came to a conclusion: maximal effectiveness of innovations in the country is achieved in stream of intense and wide-scale spread green (ecologically pure) technologies in frames of company. In the same time, energy taxes are one of the most effective instruments of state regulations of innovation development of analyzed sphere.

A large number of researches analyses the effectiveness of regulating role of state in innovation development of the country in part of cooperation with leading university sites and enterprises. So, while determining the level of innovation development in Kazakhstan, Bekniyazova, D.S., Nurgaliyeva, A.A., Korabayev, B.S., Altybassarova, M.A., Alkeyev, M. are coming to the conclusion about the lag from desired effective result. (Bekniyazova et al., 2016) As directions of improvement of innovation state regulation authors propose to promote the

partnership of science with production at optimal combination of interests of state, universities (scientific- research institutes) and private sector of Kazakhstan.

Special attention in foreign economic researches is paid for specifics of state support at financing of innovation activity of small and medium enterprises. Using the example of 2708 German small and medium enterprises that was participating in programs on promotion of public R&D within years 2005-2010, the scientists Belitz, H., Lejpras, A. are coming to the following conculsions. (Belitz and Lejpras, 2016) In spite of difficulty in credit provision in course of conduction of innovation activity, German enterprises of small and medium business nonetheless relate the major obstruction to non-financial sphere, namely, to existence of qualified personnel and mechanisms of state regulation, and also conditions of competition provision. Therefore, the future work in the field of innovation politics for small and medium business anticipates the emphasizing of attention on non-financial external frame conditions.

METHODOLOGY

In the work were applied methods of system analysis and synthesis, statistic and graphic analysis.

RESULTS AND THEIR DISCUSSION

For Russia, innovation projects of federal significance are important instrument of state innovation and industrial politics, directed at conduction of competitive advantages of science and industry, related to the effectiveness of research and development results received in state and private sector of science by order and at financial participation of the state.

Estimation of effectiveness of state regulation of innovation activity is determined by achieved results in certain regulation directions. Due to absence of relevant statistic information for year 2015 let's conduct the estimation of effectiveness of state regulation of innovation activity of RF in 2014 on basis of comparison of plan and factual values of Russia innovation development strategy indexes, data are represented in Table 1.

Table 1
MAJOR ACHIEVED INDEXES OF INNOVATION DEVELOPMENT OF RF

Name of index	2010 Fact	2014 Plan	2014 Fact
Share of non-budget funds in internal costs for research and development by sources of financing, %	31.2	33	34.2
Share of costs for technological innovations in total amount of costs for production of loaded goods and services, %	1.5	1.95	2.2
Share of innovative goods, works, services in total amount of loaded goods, conducted works, %	4.9	7.2	8.9
Share of innovative goods, works, services in total amount of export of goods, works and services, %	4.5	8.2	13.7
Share of Russia in general world number of publications in scientific journals, indexed in "Net of science" database, %	2.01	2.3	2.44

One of direction of state regulation of innovation activity in strategy of innovation development of RF is designated the creation in Russian economic of network of territorial-production clusters, realizing competitive potential of territories, and also formation of a range of innovative high-tech clusters (hereafter - clusters). At the beginning of 2016 in Russia are

formed 25 innovation territorial clusters with general number of employees of organizations-participants of 913 thousand persons in year 2015. At this the number of new high-productive work places in clusters in 2015 was 40 thousand of units (Fig. 1).

Figure 1
NUMBER OF NEW HIGH-PRODUCTIVE WORKING PLACES IN CLUSTERS, THOUSAND OF UNITS
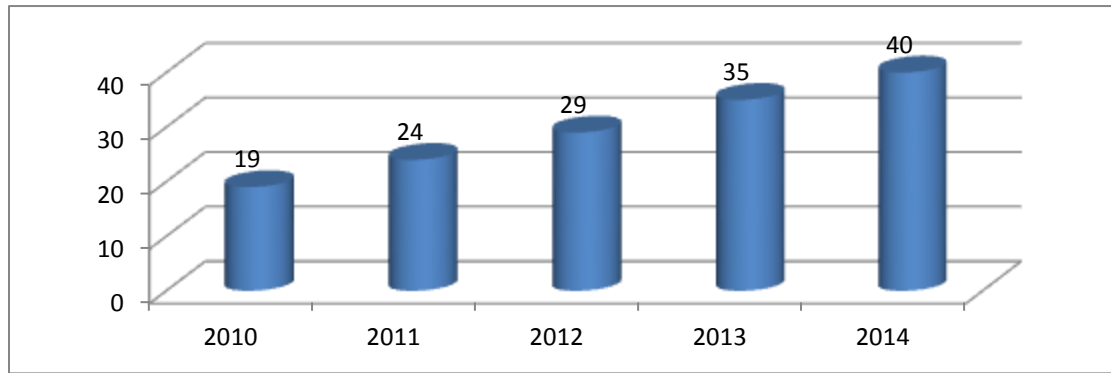
Grants for clusters development in 2013 were 1.3 billion rub., in 2014 - 2.5 billion rub.; they were directed at development of innovation infrastructure, realization of additional education programs and support of external economic activity. The effectiveness of money funds invested by state in clusters' development can be judged by increase of R&D costs of clusters' participants (Fig.2) and by increase of amounts of their investment costs (Fig.3). Even in crisis year 2014 is observed the increase of these indexes.

Total amount of R&D costs of clusters' participants in year 2012 - 2014 was 242.2 billion rub. However, this amount is significantly lower that the plan index for the same period - 968.8 billion rub. (http://www.garant.ru) Therefore, the total amount of investment costs of clusters' participants in years 2012 - 2014 was 1 137 billion rub. or 72% of amount of planned private investments of cluster's participants in period of years 2012-2015 (1574.2 billion rub.). This situation demonstrated the application of state financial resources in frames of clusters, however attraction and involvement of private sector's funds is not happening.

Figure 2
R&D COSTS OF CLUSTERS' PARTICIPANTS, BILLION RUB
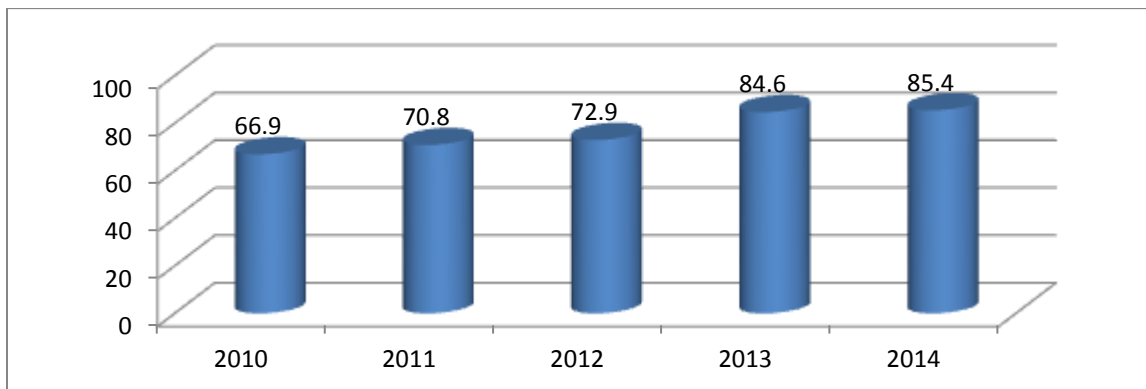
Figure 3
AMOUNT OF INVESTMENT COSTS OF CLUSTERS' PARTICIPANTS, BILLION RUB
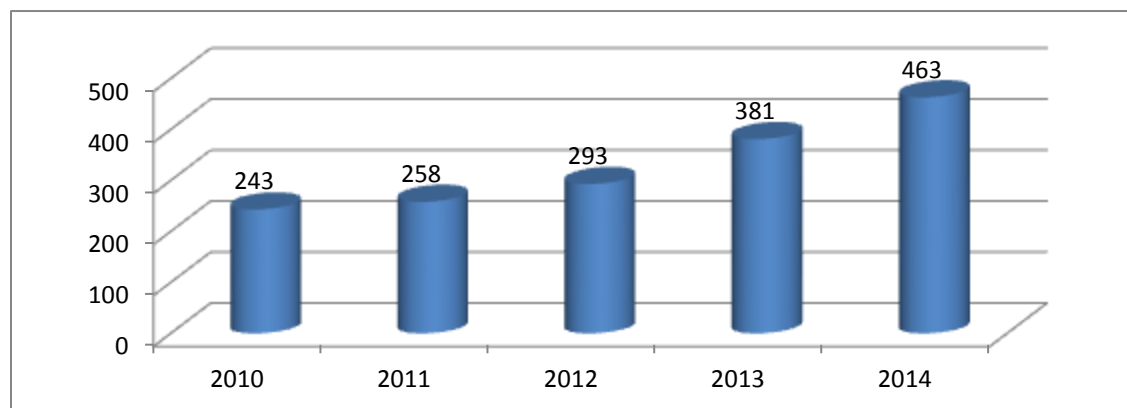
Therefore, the potential of clusters acting as effective mechanism of direct foreign investments attraction and integration of Russian clusters into the global market of high-tech production is not used to adequate degree.

As mention above, the major instrument of state regulation of innovation development of RF are state programs. By Executive Order of the Government of the Russian Federation of March 29, 2013, No. 467-p was approved the State program of the Russian Federation "Economic development and innovative economic", which objective is the creation of beneficial business climate and conditions for business conduction; increase of state management effectiveness. Amount of budged financing of state program realization from federal budget funds is 929 billion rub. (http://government.ru/news/16196/)

Degree of accordance to planned costs level is estimated for each sub-program as relation of costs, factually conducted in report year for realization of sub-program, to their plan values by the following formula:

$$CC_{y3} = \frac{3_{\phi}}{3_{\pi}}$$

CC_{y3} – degree of accordance to planned level of costs;

3_ϕ – factual costs for realization of sub-program in report year;

3_π – plan costs for realization of sub-program in report year.

As in detailed plan-schedule of realization of state program are reflected only arrangements financed by funds of federal budget only, at calculation of degree of accordance to planned costs level the data on costs of federal budget were used. As plan values are used amounts of financing anticipated by approved state program.

Table 2
DEGREE OF ACCORDANCE TO PLANNED COSTS LEVEL AND EFFECTIVENESS OF USE OF FEDERAL BUDGET FUNDS FOR REALIZATION OF SUB-PROGRAMS OF STATE PROGRAM

Sub-program	Degree of accordance to planned level of costs	Effectiveness of federal budget funds use
Formation of beneficial investment environment	0.9956	0.9389
Development of small and medium business	1.0139	0.9863
Creation of beneficial conditions for estate market development	0.9967	0.9120
Improvement of state and municipal management	1.0129	0.9873
Stimulation of innovations	0.9793	0.8564

Effectiveness of state program realization is estimated dependently on values of estimation of degree of realization of state program and estimation of effectiveness of realization of subprograms included in it by the following formula:

$$\text{ЭР}_{\text{ГП}} = 0{,}5 \times \text{СР}_{\text{ГП}} + 0{,}5 \times \sum \text{ЭР}_{\text{П/П}} \times \text{К}_j$$

$\text{ЭР}_{\text{ГП}}$– effectiveness of state program realization;

$\text{СР}_{\text{ГП}}$ – degree of state program realization;

$\text{ЭР}_{\text{П/П}}$– effectiveness of sub-program realization;

К_j – coefficient of sub-program significance (federal target program); On default К_j is determined by formula: $\text{К}_j = \frac{\Phi_j}{\Phi}$, where Φ_j– amount of factual costs of federal budget (cash execution) for realization of j-th sub-program (federal target program) ion report year, Φ – amount of factual costs of federal budget (cash execution) for realization of state program.

After conduction of calculation by this formula can be concluded that effectiveness of state program realization in period of years 2010 - 2015 are characterizes by medium level of effectiveness (Fig. 4). (http://www.rusventure.ru)

Figure 4
EFFECTIVENESS OF STATE PROGRAM "ECONOMIC DEVELOPMENT AND INNOVATIVE ECONOMIC
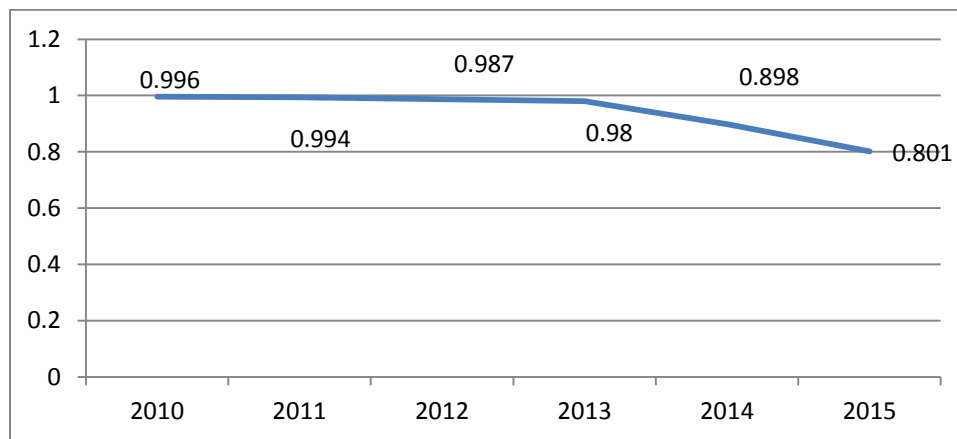
On presented Figure. 4 are clearly noted the tendency of decreasing of effectiveness of realization of state innovative programs that, in our opinion is caused by objective crisis phenomena of year 2014: political tension in Ukraine, sanction, growth of dollar course, in result of which occurred a significant shortening of budget costs.

CONCLUSIONS

In the work was given the estimation of effectiveness of state regulation of innovation activity in Russia by two interconnected directions: creation of clusters and realization of state programs. Analysis of clusters' development had shown that the growth of expenses for R&D and investment costs of clusters' participants occurred mostly by cost of budget funds. Private funds are used in extremely small amounts. On this basis the conclusion is made that the potential of clusters acting as effective mechanism of direct foreign investments attraction and integration of Russian clusters into the global market of high-tech production is not used to adequate degree.

On its turn, analysis of effectiveness of state innovation programs realization demonstrates the tendency to decrease which is stipulated, in our opinion, by crisis phenomena in global and Russian economic, and is a result of emphasis on qualitative parameters of state regulation to the detriment of qualitative characteristics.

SUMMARY

Therefore, today it is important to adjust all system of state regulation of innovative activity in such manner that it would work for solution of tasks of forthcoming period. Among these we separated the following: relieve of critical dependence from foreign technologies in a whole range of branches - these are machine tool building, instrument building industry, energetic machine construction, production of equipment of oil and gas mining; stimulating of rational import replacement that should lead to increase of quantity of produced competitive production, including in agricultural sector.

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APPROACHES TO ASSESSING COST-EFFECTIVENESS OF TECHNOLOGICAL INNOVATION: THE RUSSIAN INDUSTRIAL COMPANIES EXPERIENCE

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ABSTRACT

Industrial sector is a core of Russian economic. Industry forms approximately 26% of all gross added value in the country, practically all production directed at export into countries of former Soviet Union and outside of former Soviet Union is a result of industrial enterprise activity. The share of industry is also high in the budget of Russia, mostly by cost of oil-gas income. So, within the last decade the income of consolidated budget from export of oil and gas were 21 - 27% of total amount of income (minfin.ru). High dependence of Russia from export of initial non-processes raw material resources (mostly fuel-energetic) create risks for its economic.

The major objective of research is to analyze the effectiveness of costs for innovations in industrial sector of Russian economic. The research is based on analysis of data by regions of Russian economic in period of years 2010-2014. We applied the regression analysis for determination on major tendencies in changes of effectiveness of costs for innovations. Besides, relative indexes were constructed and grouping (by costs of innovations and investments into capital assets) of branches of industrial sector of Russian economic was conducted, which allowed to detect their current condition and make conclusions about the need of growth of investments into innovations.

Keywords: technological innovations, industrial sector, costs for innovation, effectiveness of investments, innovative development.

INTRODUCTION

At present day the Russian economic lives through a hard period of its development. The old growth model (resource-export) that worked within last decade and in many ways determined the current position of Russia had outlived itself. It is necessary to find new points of growth, re-form in a new way, transfer to resource-innovative and then to innovative way of development (Mau and Kuzminov, 2013). Industry, first of all the processing one is capable and should become namely that driver of development that would allow Russian economic to transfer to new model of economic growth.

Researches of innovations impact and their costs effectiveness are conducted both on macro- and micro-levels. So, Zhang A. et al. (Zhang et al., 2016) are considering the economic of China in period of years 1990-2012. In their research they propose to construct a range of integral indexes, and on their basis to conduct a check if innovation impact on industrial enterprises of China. The result of research became the founding of strong positive interconnection between costs for technological innovations and industrial sector in period from

2000 to 2012. The work of Brutshin E. et al. (Brutshin and Fleig, 2016) is focused on innovations on energetic sphere. On basis of 116 countries' data for years 1980-2012 is proved that the increasing rent from natural resources leads to reduction of investments into innovations. Sohag K. et al. (Sohag et al., 2015) are showing that technological innovations are impacting on functions of consumption and are capable to increase the effectiveness of energy use, which in turn would reduce its consumption. The research was conducted on materials of years 1985-2012, effects were checked for long-term and short-term periods.

On micro-level the researches are mostly concerned on interconnection of innovation coses, innovations and development of branch or enterprises. As show Kumar A. et. al. (Kumar and Bose, 2016), without innovation the effective survival and functioning of the company is impossible. Their research is based on data of European and Chinese enterprises. The econometric analysis conducted by them shown that innovation are effective for large enterprises. In work of Guo D. et al. (Guo et al., 2016) is considered the impact of state costs for innovations for issue of innovative production by companies. For analysis are used panel data on enterprises in period of years 1998-2007. Constructed econometric models had detected that enterprises with state investments in innovation are producing much more innovative production by comparison with enterprises where such investments are absent. Besides, changes in method of financing (from centralized to decentralized) are causing a significant effect on considered index too. According to Colombelli A. et al. (Colombelli et al., 2013) companies with larger volume of investments into innovations are growing at higher rate. Work is constructed on consideration of data for years 1993-2004 for economic of France. There is shown that actually the investments into innovations have a significance, especially for small enterprises, at which they are causing mode significant effect. Martin M. et al. (Martin, 2015) considers diverse types of costs for innovations and their impact on industrial sector of Poland.

METHODOLOGY OF RESEARCH

Object of research is an industry of Russia on regional and branch level. For analysis were taken spacial data on 80 regions of Russia. Considered period: years 2010 – 2014. The objective is the estimation of effectiveness of investments of industrial enterprises in innovations. The research is based on estimation of impact of investments in innovations and investments into capital assets on amount of loaded innovation production and total amount of production respectively. As the major method acts construction of econometric models. Other method applied in the work is based on construction of relative indexes. Indexes of return of costs on technological innovation (relation of amount of loaded innovation production and costs for technological innovations) and return of investments in capital assets (relation of amount of loaded production on investments in capital assets) are correlated. This method is suitable, first of all, for comparison on "innovative effectiveness" of branches of industry between each other; second, for comparison of effectiveness of branches relatively to general index of industry.

RESULTS AND THEIR DISCUSSION

For each considered year (2010 – 2014) was constructed separate econometric equation. Then the received coefficients were compared to each other: investments into innovations are considered as effective, first, when elasticity by them has an increasing return; second, when elasticity by them exceeds the elasticity by investments in capital assets.

Results of conducted empiric check of dependence of amount of loaded innovation goods, conducted works and provide services from costs for technological innovations of industrial enterprises of Russia are shown in Table 1.

According to received data, within considered period was observed statistically significant and close direct dependence between selected indexes. At this the degree form of dependence was prevailing, its formula has the following form (Formula 1):

$$Q_{inn} = aI_{inn}^b \text{,(1)}$$

where Q_{inn} – amount of loaded innovative production, in million RUR;
I_{inn} — amount of costs for technological innovations, million RUR;
a, b – coefficients of equation

Coefficient b is a measure of elasticity, it shows, for how much per cent in average is changing dependent variable t change for one per cent of independent one. At this its absolute value less than one is the evidence of reducing return Q_{inn} from I_{inn}; the value equal to one – about the constant; and in case of exceeding one – about increasing one.

Table 1
RESULTS OF ESTIMATION OF ELASTICITY OF AMOUNT OF LOADING OF INNOVATION PRODUCTION ON COSTS FOR TECHNOLOGICAL INNOVATIONS

Year	Form of equation	Coefficient at independent variable (b)*	Significance of coefficient b (p - value)	Coefficient R^2	Corrected R^2	Significance of R^2 (p - value)
2010	degree	0.8799	0.0000	0.6590	0.6543	0.0000
2011	degree	0.9723	0.0000	0.7384	0.7349	0.0000
2012	linear	1.0441	0.0000	0.9479	0.9472	0.0000
2013	degree	1.06426	0.0000	0.7532	0.7499	0.0000
2014	degree	1.1466	0.0000	0.8357	0.8336	0.0000

*In case of linear connection instead of coefficient at independent variable is shown the average coefficient of elasticity

In period of years 2010-2014 there was a steady growth of elasticity coefficient, which is an evidence of increase of effectiveness of investments in innovations from year to year. However, "really" effective that can be acknowledged only from year 2012.

In a similar way was conducted the research of dependence between amount of production loaded by industrial enterprises and amount of investments in their capital assets (Table 2). In this case there is also a close and direct statistic connection, but its form is different from previous dependence (linear).

That's why for adherence to comparability instead of coefficient at independent variable was calculated the average coefficient of elasticity $\bar{\varepsilon}$ (Formula 2):

$$\bar{\varepsilon} = b\frac{\bar{I}}{\bar{Q}}(2)$$

where $\bar{I}$ – an average arithmetic value of amount of investments into capital assets of industrial enterprises, in million RUR;

$\bar{Q}$ - average arithmetics value of amount of loaded goods of own production, works and services conducted by own forces, in million RUR.

b - coefficient of linear regression at independent variable I

Table 2
RESULTS OF ESTIMATION OF ELASTICITY OF AMOUNT OF LOADING OF PRODUCTION BY INVESTMENTS IN CAPITAL ASSETS

Year	Form of equation	Average coefficient of elasticity, %	Significance of coefficient b (p - value)	Coefficient R^2	Corrected R^2	Significance of R^2 (p - value)
2010	linear	1.0152	0.0000	95.6468	95.5846	0.0000
2011	linear	1.0688	0.0000	96.0828	96.0261	0.0000
2012	linear	1.0892	0.0000	95.3884	95.3261	0.0000
2013	linear	1.0386	0.0000	96.6496	96.6050	0.0000
2014	linear	1.0806	0.0000	96.5247	96.4757	0.0000

Therefore, when detected indexes to each other and by years are compared (Fig. 1) it becomes clear that investments into innovations became absolutely effective even not in 2012 but a year later, when the exceeding of elasticity by costs on technological innovations over elasticity on investments into capital assets had begun.

Figure 1
**DYNAMICS OF COEFFICIENT OF ELASTICITY OF ANOUT OF LOADED INNOVATION
PRODUCTION BY COSTS ON TECHNOLOGICAL INNOVATIONS OF RF ENTERPRISES BY
COMPARISON WITH ELASTICITY OF AMOUNT OF LOADED PRODUCTION BY INVESTMENTS
INTO CAPITAL ASSETS***

■ The elasticity of the products volume shipped for investment in fixed capital

■ The elasticity of the shipped innovative products volume
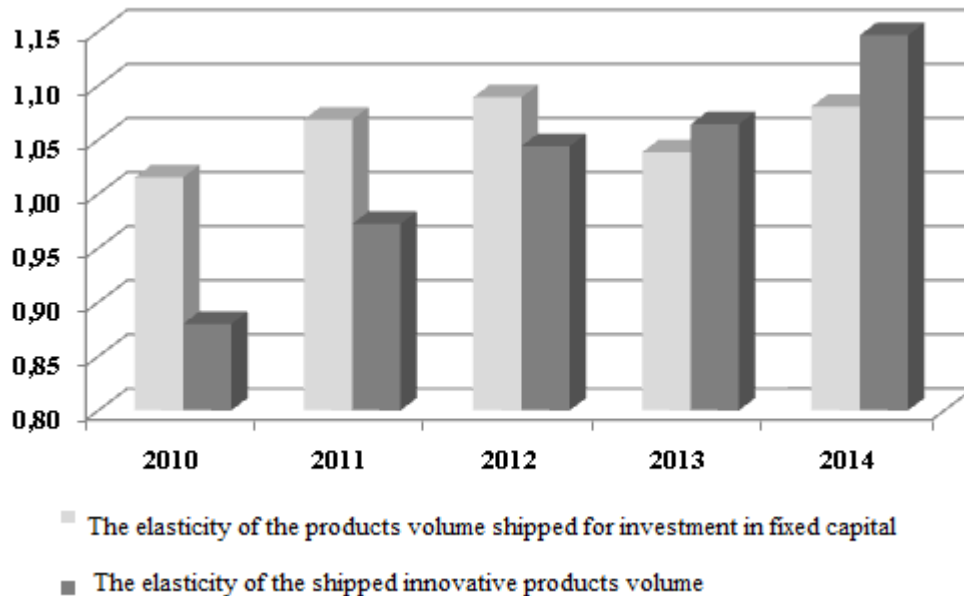
* own calculations based on data of Federal statistic service of RF (www.gks.ru).

Differently from previous method, based on inter-regional comparison, the second method proposed by us is concluded in comparison of basic branches of Russian industry (according to RNCEA) with each other and relatively to general value of industry on basis of proportion of return of costs on technological innovations and investments into capital assets.

Index of return of costs on technological innovations (K_{inn}) is calculated by the following formula (Formula 3):

$$K_{inn} = \frac{Q_{inn}}{I_{inn}} \tag{3}$$

The return of investments into capital assets of industrial enterprises (K_{inn}) is calculated by the following formula (Formula 4):

$$K = \frac{Q}{I} \tag{4}$$

By its essence this method is reduced to positioning of industrial branches to the matrix which is divided relatively to general branch index into four quadrants (Fig. 2).

Quadrants positioned in left part of the matrix are characterized by low return of investments into capital assets; quadrants positioned in right part - by relatively high, respectively.

Branches that fall into lower field had shown the low effectiveness of investments into innovations, and in higher - high.

Figure 2
DISTRIBUTION OF BASIC BRANCHES OF RUSSIAN INDUSTRY ON BASIS OF PROPORTION OF RETURN OF INVESTMENTS INTO CAPITAL ASSETS AND RETURN OF COSTS ON TECHNOLOGICAL INNOVATIONS IN 2014
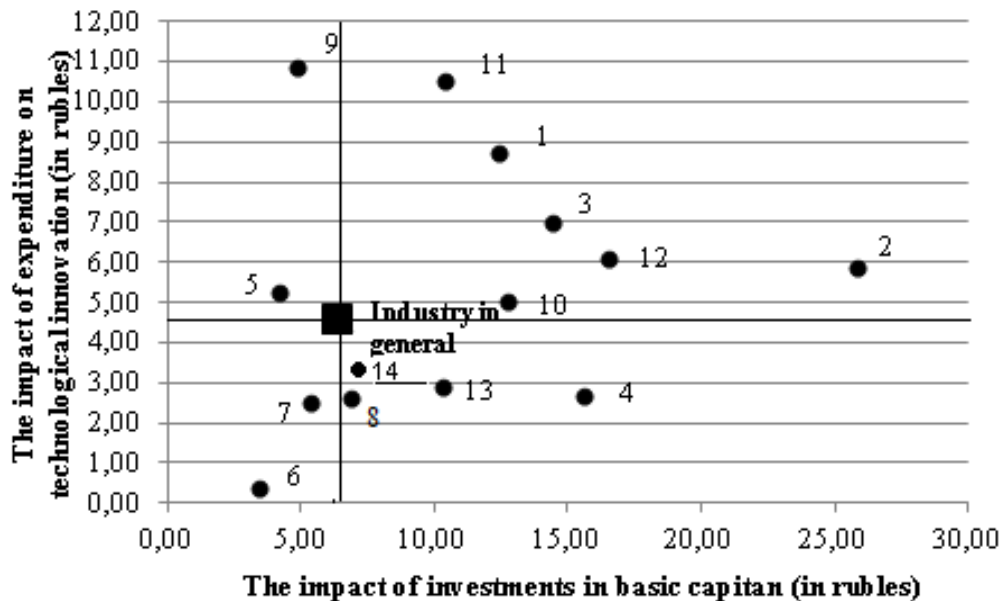
*1 - production of transport means and equipment
2 - textile and sew production
3 - production of food products, including drinks and tobacco
4 - production of electrical equipment, electronic and optical equipment
5 - mining of commercial minerals
6 - production and distribution of electric energy, gas and water
7 - processing of wood and production of wood items
8 - chemical production
9 - production of skin, skin items and production of shoes
10 - cellulose-paper production; printing and polygraph activity
11 - production of rubber and plastic items
12 - metallurgic production and production of finished metallic items
13 - production of machines and equipment
14 - production of other non-metallic mineral products

Therefore, as had shown the practical analysis of distribution of branches of Russian industry, in year 2014 effective by all parameters were the following branches:

1)   production of rubber and plastic items;
2)   production of transport means and equipment;
3)   production of food products, including drinks and tobacco;
4)   textile and sew production;
5)   metallurgic production and production of finished metallic items

Return of investments into innovations of branch of commercial minerals mining and production of skin, skin items and shoes was relatively high, but at this these branches did not achieve the leading position ny return of investments into capital assets.

And, finally, the remaining ones were the worst bit by the first and the second criterion.

CONCLUSIONS

In result of conducted research we analyzed the effectiveness of costs for technological innovations of industrial enterprises. In order to do this two major method were applied: construction of econometric models and further analysis of received coefficient of elasticity; construction of relative indexes. Constructed indexes allowed to conduct the clusterization of industrial branches on basis if two indexes: investments in capital assets and costs for technological innovations.

SUMMARY

Distribution by received groups gives the ability to clearly see the condition of on or another branch, and on this basis to give recommendations on its further development.

Results of econometric analysis had shown that in considered period occurred the growth of effectiveness of costs for innovations, and absolutely effective they become in year 2013.

Further development of research of costs for technological innovations of industrial enterprises is connected to detection of diverse factors, causing direct impact on them. So, the construction of econometric models with use of macro-economic, institutional an political factors appears to be rational. This research was conducted on basis of analysis of industrial sector of Russian economic, further it ios necesary to extend the onject of research and conduct panel researches on world economic in general.

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PRINCIPLE OF ECONOMIC DEVELOPMENT IN CONTEXT OF POST-MODERNISM SITUATION

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ABSTRACT

In work is considered the principle of economic development in situation of post-modernism. Actuality of addressing to theme is stipulated by the failure of modernism project in XX century, which in the light of situation of post modernism that replaced it had required the re-consideration of category heritage of modernism, including the principle of development. An important peculiarity of this requirement happened to be the fact that it is dictated not only by logic of theoretic thought development but by the practice of history itself too. That's why the addressing to development in economic, the the ability of its existence in it itself and search for its model in contemporary conditions of post-modernism is an actual task, without study of which is impossible to speak about a goal-directed search for solution of economic problems in XXI century. The objective of work consists in consideration and analysis of approaches to understanding of development principle used in economic-philosophical literature in prism of situation of post-modernism, in grounding of demand of development issue solution and designation of method of such solution possibility in frames of post-modernism itself. Author distinguishes four approaches to understanding of the development in his work: dialectical, pendulum, post-modernist and contemplative. These approaches are reduced to major two: dialectical approach and contemplative-practical approach, inherent for situation of post-modernism. In each of this positions are market strong and weak sides, conclusions are made about the fact that none of them is prevails the other and is not presenting the solution of development problem in situation of post-modernism. Also in the work is proved that post-modernism need the development principle and search for its model capable to provide the consequential activity in situation of ruptured being, which confirmation is the addressing to the identity concept that is a temporary solution of this task. As one of the possibilities of its solution in the future, in the work is proposed a consideration of development problem through prism of proportion of categories of single (unique) and general.

Keywords: development principle, economic, post-modernism, dialectic

INTRODUCTION

One of the focuses of instability of contemporary world is the sphere of economic that includes not only economic relations but also economic consciousness as an aggregation of values, institutes, standards determining the nature of these relations, which is brilliantly shown in his researches by Nobel laureate in economic D. Nort .

Studying of aspects and problems of economic consciousness always anticipated the addressing to the development which is a quality passage from established condition in the direction of designated goal.

Development (we will speak about it in frames of social context only) as activity concept directed at transformation of social reality in interests of a human is the most important principle

of modernism era. We should remind that namely the modernism, basing on the value of a human mind, proclaimed its goal a practical application of social relations and search of the best variant of their arrangement. Actually, as XX century had shown, the modernism project failed in the depth of two world wars, which led to its replacement by situation of post-modernism, to which we are all contemporaries today.

One of the main reasons of modernism's failure from the point of view of post-modernism is the absence of attention to analysis of social being essence. That's why, differently from modernism, the post-modernism is based on provision that the world of social relations is heterogeneous not only structurally but essentially too.

Research id such world requires from scientists a readiness to reconsideration, deconstruction of category-methodological heritage of modernism, including the principle of development.

Addressing to it, to the possibility of development existence in situation of post-modernism itself becomes especially actual in conditions of growth of instability in global economic of the second decade of XXI century. In this regard as an objective of the work we will consider and give the analysis if major approaches to understanding of development principle applied in economic-philosophical literature in context of situation of post-modernism. We will designate the demand of search for solution of development issue in the frames of its needs and briefly designate the method, on which basis is possible to reach its solution.

Before we continue, we should warn that in the basis of our work lay researches of the following foreign and domestic authors: Veblen T. (https://vk.com/doc5497207_315422038?hash=4bcb50449db2e25253&dl=106f5ebc7ffc9a476d) , Derrida J. (http://platonanet.org.ua/load/knigi_po_filosofii/knigi_na_inostrannom_jazyke/derrida_zh_derrida_j_prizraki_marksa_spectres_de_marx_2006_1993/43-1-0-1775), Deleuze J. (http://platonanet.org.ua/load/knigi_po_filosofii/postmodernizm/delez_zh_razlichie_i_povtorenie/54-1-0-2420), Zizek S. (Zizek, 2010), Cristopher L. (http://modernlib.ru/books/lesh_kristofer/vosstanie_elit_i_predatelstvo_demokratii/), Foucault M. (http://www.gumer.info/bogoslov_Buks/Philos/fuko_arh/; http://royallib.com/book/fuko_mishel/rogdenie_biopolitiki.html), Erikson E. (http://www.gestalt.org.ua/index.php?option=com_content&view=article&id=505:--q---q&catid=53:2010-09-10-22-59-35), Katasonov V. (Katasonov, 2013), Rzayeva R.O. (http://vphil.ru/index.php?option=com_content&task=view&id=900), Poll K. (https://slon.ru/economics/pochemu_ekonomicheskaya_nauka_bessilna-130856.xhtml) and others.

METHODS AND RESULTS

Development means the characteristic of qualitative changes of objects, linked to transformation of their internal and external connections. At this to it are inherent such attributes as orientation, one-wayness, succession, unity of quantitative-qualitative changes. They lend a peculiarity to development and distinguish it from other approaches explaining changes in the world via creation, explosion, emergence from nothing. Finishing the brief characteristic of this category we wish to note that the most developed theory of development at present day is the method of dialectic.

After determining of what the development is let's consider major approaches formed in contemporary literature to its understanding in situation of post-modernism.

First is dialectical-materialistic approach (to understanding of the development), a major representatives of which were K. Marx, V. Lenin and others. (http://www.e-reading.club/bookreader.php/1043991/Dialektika_istorii_chelovechestva._Kniga_1.pdf).   Its peculiarity is the fact that it is oriented for progress, for motion forward to desired ideal.

This approach allows to consider phenomena ion dynamic and interconnection with each other, separate substantial features and properties of object (or objects), give a forecast about perspectives of existence and change of studies subject in the future. Thus the dialectical-materialistic approach to development helps both to determined the goal of desired changes and to clear designate the way of its achievement via "removal" of contradictions between existing phenomena of social life. All this tells about a string side of this approach, indeed it arguments the belief of a man in ability to change the world in accordance to own needs.

At the same time, the post-modernist critic of dialectical-materialistic approach had detected a range of serious drawbacks inherent to it. To the, belong not only randomness, but also far from true objectiveness of constructed by researcher cause-and-effect connections between phenomena, but also the impossibility to manage the development in order to achieve the desired result. The latter is important for us, because it points at the fact the the idea of progress, laying in the foundation of dialectical understanding of development, is unachievable in practice, because contradictions inherent for social life phenomena cannot be removed in dialectical synthesis.

The second approach is not clearly articulated in economic literature, so it can be conditionally designated as pendulum. In its basis lies the comparison of usually two systems of relations, where the choice in favor of one of them is determined by preferences of author himself.   In works it is most frequently represented in its retrospective form (K. Lash (http://modernlib.ru/books/lesh_kristofer/vosstanie_elit_i_predatelstvo_demokratii/), T. Veblen (https://vk.com/doc5497207_315422038?hash=4bcb50449db2e25253&dl=106f5ebc7ffc9a476d) , V. Katasonov (Katasonov, 2013)) and much more rarely in projective one (M. Foucault (http://royallib.com/book/fuko_mishel/rogdenie_biopolitiki.html)).

A strong side of this approach is the fact that it proposes the direction of motion to clearly formulated model of relations. For example, in direction of return from capitalism to Christian economic, or in direction of movement of a certain variant of capitalism, purified from alien elements non-inherent for it. In the light of said becomes clear the popularity and, as a result, prevailing of retrospective form of pendulum model of development over its projective form. Indeed, the movement in direction of already known system of relations that expressed itself in practice of social life is more preferable than selection of ideal grounded in theory only.

Nevertheless, the practical realization of pendulum approach to the development is hardly possible. So, if to speak about its retrospective model, than, as is well known from school course f philosophy - one cannot enter the same river twice. This means that no matter how attractive can seem to be the variant of return to the past, it is utopical in its essence, we just cannot resurrect something that already had been, turning the time backwards. Therefore, the only one ability to return to ideals of the past is the movement to them through the development forward, which means the returning to dialectic model of development with all drawbacks inherent to it. If to address to projective form of pendulum approach then, it comprises a logical contradiction in its basis. The fact is, that the receiving of marked ideal anticipates the stop of development. which is principally impossible, because any model of relations is always causing problems inherent to it. From here the constant search of ability of their elimination returns the supporters

of this point of view to drawbacks of dialectical model of development once again. (http://schumpeter.ru/wp-content/uploads/2015/11/Nort-institutes.pdf)

The third one is the post-modernist approach to understanding of development, represented in persons of M. Foucault, J. Derrida, J. Deleuze, J. Lyotard. Its peculiarity is the accent on critics of dialectical model of the development, to its strong sides can be related the following:

- Dialectical principle of the development is not effective in affair of transformation by a man of own economical being, because it is based on simplified homogeneous model of world understanding inherent to modernism.

- At the same time the post-modernism does not completely deny the possibility of use of dialectical principle of development in scientific cognition, but limits the sphere of its application by frame of local, integral by their nature formations, for example, particularly taken discourses.

- Post-modernist thought, continuing a long-standing tradition of critic of cause-and-effect construction, lying in the basis of dialectical understanding of the development, pursues as its goal not its exclusion from scientific turnover, but the clean the space for emergence of other approaches to understanding of phenomena interconnection in heterogeneous world of post-modernism.

In result of said, the major drawback of post-modernist critic of dialectical approach to understanding of the development is the absence of its practical alternative.

The fourth approach to the development can be designated as "contemplative" (its representative is, for example, S. Zizek). He proposes not so much to search possibilities of development existence, as to subject to all-side thorough analysis this concept in context of modernism and post-modernism, as landmarks in the history of Western philosophical thought. On this basis, shortly, the credo of contemplative approach can be expressed by words of Lenin: "learn, learn and once more learn", i.e., to learn to study and to learn in course of studying. With this science-oriented appeal one cannot but agree, as it represents the strong side of represented approach to understanding of the development.

At the same time this approach not only appeals for analysis of such complex phenomena as modernism and post-modernism, without which is really impossible to solve the issue of the development in situation of post-modernism, but also makes absolute the role and meaning of analysis procedure, tears it off practical needs, which cannot be acknowledged as a strong side of "contemplative"   approach   in   any   way. (http://www.gestalt.org.ua/index.php?option=com_content&view=article&id=505:--q---q&catid=53:2010-09-10-22-59-35)

Before we designate the possible variant of development problem solution, let's consider the issue of demand for search of such solutions in frames of post-modernism situation itself.

Post-modernism need the addressing to principle of the development, this is related not only to the fact that it does not deny the possibility of its application, but also because it does not oppose a clear alternative to the development, which is unallowable at addressing to solution of practical issues of economic conscience existence in torn discursive world of post-modernism. On this basis a temporary, forces exit from this situation becomes adaptation of modernism heritage to post-modernist world model, for which the concept of identity is an example.

This is a complex cross-disciplinary concept that, in relation to needs of social-humanitarian cognitions in most general features, can be defined as a constant process of construction of own integral image of "I" (Smirnov, 2014). Therefore, identity anticipates, on

one side, the tear, and on the other side the strive to overcome it without any hope to complete this process.

Such duality of this concept allows to adapt the principle of development for consideration of issues related to existence of economic consciousness in folded world of post-modernism, which seems to be one of not last explanations of popularity of identity term use today. However, such approach to principle of the development is a temporary solution, because the concept of identity is controversial in its content (at the same time state and denies the being integrity), and in result of this cannot provide the stability of selection of task-oriented activity of a man.

Completing the article we, without claiming the solution of the task of search for model of development adequate for requirements of post-modernism situation, would briefly mark only one possible ways of its solution.

From our point of view it is a consideration of principle of the development through prism of proportion of categories of single (unique) and general.

Here the first means unique, specific in thins and phenomena, that makes them unmatched, when the second points at those that can be interchangeable in them. Therefore, we can draw a direct analogy between these categories and development in situation of torn being. So, the single is the most important characteristic of post-modernist world of local phenomena, with tears and severe limits inherent to it, while the general serves as a basis for understanding of the development, because by means of general are overcame the limits of local phenomena, which open the way to consideration of objects in their sequential interconnection with each other. Really, at addressing the issue of proportion of single and general, than one can see that these concepts are closely interlinked with each other and stipulate each other in things an phenomena. Take a car as example. The single in it is those peculiarities and properties that make it not similar to any other, and the general allows to relate it to certain model and class of automobiles. Without unity of single and general the car is impossible. And not only from the point of view of cognition logic, but also from practical side. Indeed, without general the car is left without consumer properties and qualities, and without unique we would not be able to tell anything about peculiarities of assembly and operation of this car, specifics of its operation etc. On this basis, by analogy, we can conclude that tear and sequence in situation of post-modernism can also stipulate each other and interact with each other.

CONCLUSIONS

1. The problem of existence of purposeful economic development in prism of situation of post-modernism is not only heuristically interesting, but practically significant, because outside of construction of development model that accords to requirements of torn world of post-modernism one cannot speak about the effective solution of economic problems.

2. Generalizing presented approaches to understanding of the development, used today in philosophical-economic literature, they can be reduced to two major: it is dialectical position and contemplative-critical position inherent to contemporary era of post-modernism.

3. Each one of presented positions, first, does not have a priority over each other, and, second, beside advantages, comprises substantial drawbacks, allowing to state that none of them can be accepted as a solution of the development problem in post-modernism.

4. A peculiarity of post-modernism situation is a dualistic relation to problem of the development. On on side, post-modernism denies its dialectical interpretation, and on the other

side, it need th addressing to iy at condition of its adaptation to need of realias of complex in its essential foundation of social being.

5. Due to the fact that proportion of single (peculiar) and general are threading the cloth of not only dialectical method but also post-modernist idea about the essence of being, addressing to them is one of the keys to search of possibility of economic development problem solution in post-modernism.

SUMMARY

Summarizing the above said we wish to note that only via analysis of concept of he development in prism of needs of onthological project of post-modernism, emerged as a result of historical practice of modernism failure, we are able to speak about the construction of effective models of economic development in XXI century.

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THE COMPLEX OF TECHNOLOGIES OF WELLS STIMULATION FOR INCREASE THE EFFICIENCY OF CARBONATE COLLECTORS DEVELOPMENT

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ABSTRACT

The complex of technologies solves the problem of preservation, restoration and improvement of the natural (or lowered by man-made impact) reservoir properties of formation pay zone, as well as increasing the area of active drainage and extent of hydrocarbon selection by oil producing wells of various designs in heterogeneous porous-fractured carbonate reservoirs. The scientific and methodological basis for the complex of wells stimulation technologies in carbonate reservoirs is phased, sequential, rational inclusion in the development and operation of the entire productive formation thickness, and only then - the consistent, gradual implementation of the physical and chemical effects over the depth and length of the reservoirs. The article presents the solution of urgent problems of the recovery and increase the productivity of oil producing wells in carbonate reservoirs of the Republic of Tatarstan; the system of their stimulation over the whole chain of the oil production process, starting with the opening of reservoirs and ending by remedial cementing; the reducing of oil production costs through the effective application of integrated technological solutions, operation overlap in time, saving processing time and materials, reducing of downtimes; reduction of energy consumption on pull out of the hole with water cut production; improving the technical and economic efficiency of the massive technology, greater volume acid treatment of vertical and horizontal wells, increasing the current and final oil recovery factor. The solution of these problems was made on the basis of proposed by the authors innovative, science-based, utilized in the production and implemented on industrial-scale, the complex of technical and technological solutions, ensuring the achievement of significant increase in the efficiency of hydrocarbon production over the oil fields.

***Keywords**: complex, the technology of hydrochloric acid treatment, carbonates sediments, bottom-hole treatment, production enhancement of the oil, incremental oil production, efficiency.*

INTRODUCTION

The main purpose of the natural resources field development is the most complete extraction of hydrocarbon feed and associated components at the economic feasibility and the environmental safety of production processes, transportation and preparation of products.

Currently, it is the oil began to define the national strategy of the countries and world politics. Oil so much penetrated with all spheres of our lives that we do not even realize its

broader meaning, as D. Yergin said, "The world is a "hydrocarbon society", and we are, on the language of anthropologists "the people of hydrocarbons" (Yergin, 1999).

Despite the efforts and achievements of the world fundamental science on developing the new sources of energy, all the world's energy agencies recognize that, in the first half of the twenty-first century, the main energy carriers in the world will continue to be oil and gas. The changing of the structure of the global energy consumption in the XXI century is shown in Figure 1. (http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html). In perspective up to 2040, it is not expected the significant reduction in the total share of oil and gas in the global consumption of primary energy - it will remain practically unchanged (56.7% - in 2011 and 49.8% - up to 2040).

Figure 1
THE STRUCTURE OF THE GLOBAL CONSUMPTION OF TRADITIONAL TYPES OF ENERGY RESOURCES IN 2000 AND 2011
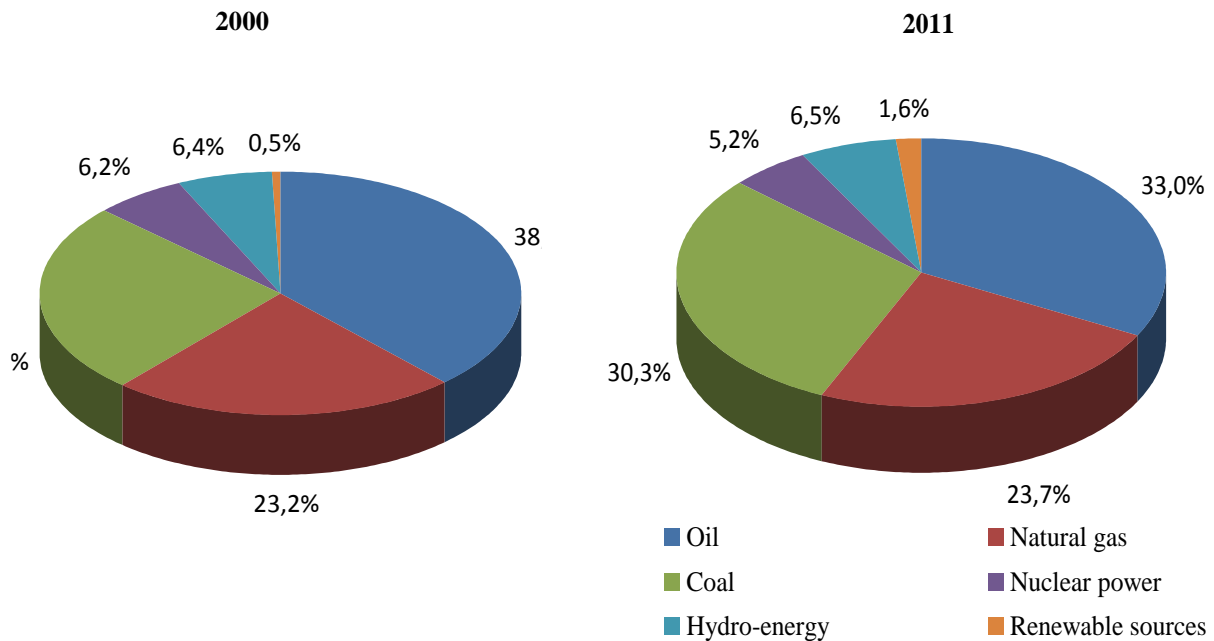
The modern history of oil dates from 1859. It is the growth of its production in the XX century, provided a rapid development of the business. Even the appearance of new energy sources in future, will retain the oil and gas exceptional value as unique chemical raw materials and high-energy fuel.

As far back as the middle 60s of the past century, King Hubert (the chief specialist of the US oil company Shell) proposed the influence curve of annual oil production from the initial recoverable reserves of oil (IRRO) for 48 southern states of USA.

The obtaining curve was in the form of the bell, with symmetric growth of oil production, since the beginning of its industrial production in the 60s of the XIX century, with its subsequent fall, and the peak of oil production was in 1970. He said, that the decline of production will

certainly be, despite of improving drilling techniques and the use of new production technology of hydrocarbons (Rogers, 2008).

The production of oil in USA reached its peak in 1973, and already in 1981 the USA oil companies produced by 30% less, within 48 states. Today, the USA is the first in the world in terms of oil consumption, and the most part of it is imported.

Jim Rogers, the finance professor in business school of the University in Columbia, writes: "King Hubert made a prophetic statement. Even more surprising is that, he is the only person on the planet, noting that US petroleum reserves (outside of Alaska) will be depleted. Today there is a small group of new King Huberts in the world, which predict that the peak of oil production in the world is not far off. And no one wants to listen to them again." (Laurent, 2008).

Alan Greenspan also was embarrassed by the question of satisfaction of growing world oil demand in future. He writes: "How many years will oil be enough to mankind? According to many experts, the volume of supply will decrease long before the end of this century". (Greenspan, 2008).

Now, it is no doubt that oil will come to the end, sooner or later. Global volumes of oil deposits are limited and the quantity of oil fields are limited too. Sooner or later, all the existing oil deposits will reach their peak, and new large oil fields will be found rarer.

The endowment of the current world oil production by the measured and indicated predicted resources is for 43 years, and the practice shows that predicted resources of sedimentary basins are increased.

Table 1 shows the top ten countries for on spec oil reserves.

Table 1
TOP TEN COUNTRIES FOR OIL RESERVES (BILLION BARRELS)

Countries	Proved reserves for 01.01.2013	Proved reserves for 01.01.2014	Proved reserves for 01.01.2015	Proved reserves for 01.01.2016
Venezuela	297,6	298,3	300,0	300,9
Saudi Arabia	265,9	265,9	267,0	266,6
Canada	173,9	173,0	172,2	172,2
Iran	157,3	157,8	157,8	157,8
Iraq	140,3	144,2	143,1	143,1
Kuwait	101,5	101,5	101,5	101,5
United Arab Emirates	97,8	97,8	97,8	97,8
Russia	105,5	105,0	103,2	102,4
Libya	48,5	48,4	48,4	48,4
Nigeria	37,2	37,1	37,1	37,1
Total for 10 countries	1416,1	1428,9	1428,1	1427,7
Total for the world	1547,3	1695,5	1700,0	1697,6

Really, after the selection of 40-60% the initial recoverable reserves of oil, usually the reduction of oil production took place within the oil fields at a rate of 5-15% per annum and to maintain the achieved level of oil production, it is necessary to explore new oil fields. At the same time, it is necessary to carry out a large complex of geological and technical measures to reduce the rate of decline in oil production over the producing fields. Thus, the retention of oil

production on the reached peak level over the country requires much more efforts and expenses than the development of new oil fields. Global oil production is shown in Table 2.

Table 2
GLOBAL OIL PRODUCTION

Years	Global oil production, mln tones
1900	19,8
1920	94,3
1930	193
1940	194
1950	521
1960	1051
1970	2290
1980	2975
1990	3000
2000	3455
2010	3978
2011	4019
2012	4119
2013	4127
2014	4229
2015	4362

Abundant natural resources of Russia, which we are proud, always served for its survival in difficult times and recovery after them, and today, these resources contribute to the progress, democratization and prosperity of the peoples, inhabiting the country.

Oil and gas potential of Russia is much higher than the average in the world, and natural resources of Russia are the base of its economy, and oil and gas are its driving force. We sell them, nothing wrong with this, especially in the harsh climatic conditions of Russia and within large territories, the oil and gas production requires a lot of effort and hard work.

The resource base of hydrocarbon feed in Russia is characterized by a steady increase in the proportion of hard to recover reserves (HRR), over the past decade, their share increased to 62% (Iskritskaya, 2013).

The most acute problem of the development of hard to recover reserves is in the "old - traditional" oil-producing regions, in the European part of Russia, where other sources of maintaining stable oil production almost none.

The Republic of Tatarstan (RT) with a well-developed infrastructure, being a part of the Volga-Ural oil and gas province, belongs to the "old - traditional" region.

To date, in the Republic of Tatarstan, among the total volume of remaining recoverable reserves in categories $A+B+C_1+C_2$ the actual oil reserves are equal 29.6%, while the hard to recover reserves are equal 70.4% (Yartiev, 2014), which means, that to maintain stable oil production at high level, it is necessary to develop hard to recover reserves more actively (Figure 2).

Figure 2
CHANGES IN THE RATIO OF HARD TO RECOVER RESERVES IN THE REPUBLIC OF TATARSTAN
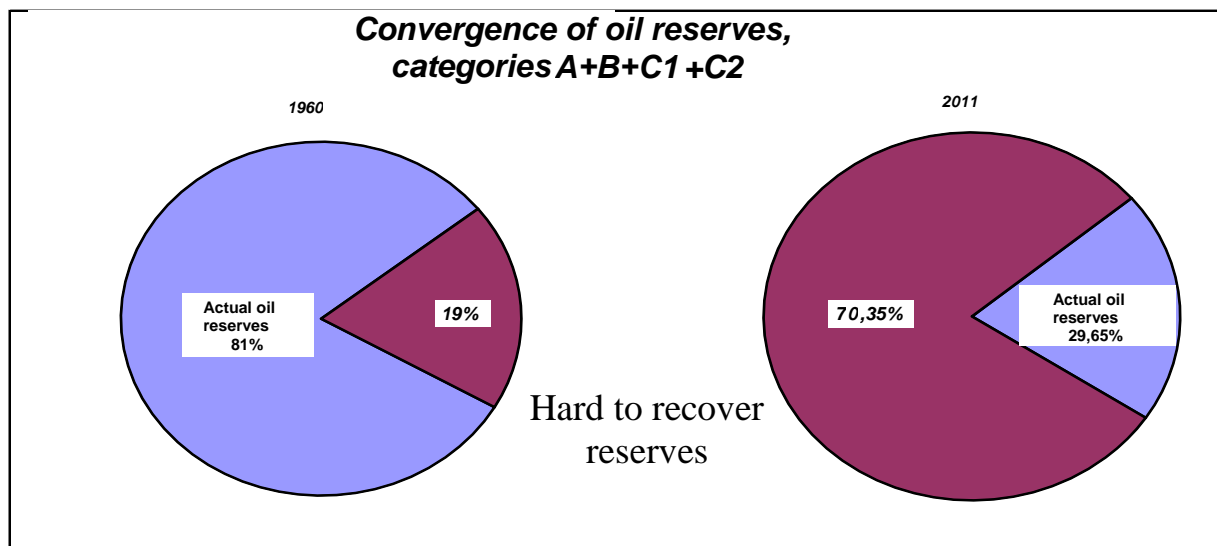
According to the forecasts, the carbonate reservoir beds of the Republic of Tatarstan have more than 60% of promising oil reserves, and production of oil from carbonate deposits will reach in 2017 almost 2/3 of the total annual production.

The strategic objectives of the Republic of Tatarstan fuel-power complex in recent years, is stabilization and gradual increase of oil production, both by means of bringing into development of new deposits and areas, and by improving the operational efficiency of the old oil facilities (Romashkinskoye, Bavlinskoe, Novo-Elkhovskoye and other production fields), which are at the late stage of development. The productivity of the old wells is restored and can be increased by the regular use of technology of bottom-hole formation zone treatment (PBZT), and other stimulating operations and physical-chemical impact on the bottom-hole formation zone or on the reservoir as a whole.

The creation and implementation of new technical and technological solutions, increasing the productivity of oil wells with hard to recover reserves of unfluxed carbon oil in a regional scale, is an important and urgent task as for the scientific as for the practical aspects of rational long-term development of oil fields in Republic of Tatarstan.

MATERIALS AND METHODS

The complex, drawing by experts, includes 15 new technologies, methods and their modifications, a number of new and improved technical equipment and solutions, more than 10 advanced compositions of operating fluids.

1. The stimulation technologies of vertical equivalent wells, operating within the carbonate reservoir beds are the following:

- The technology of directed hydrochloride acid treatment (HAT) of reservoir;
- The technology of cyclical-directed hydrochloride acid treatment;
- The technology of deep (matrix) hydrochloride acid treatment;
- The technology of complex of acid-churn-implosion impact;
- The technology of increasing the productivity, using the acid-stimulating compositions (ASC);
- Technological variations of large-volume selective acid treatment (LSAT);
- The technologies of carbonates acid fracturing;
- Technological variants of wells stimulation with simultaneous limiting of water inflows.

2. The technologies of bottom-hole formation zone treatment and stimulation of productivity of horizontal equivalent wells in carbonate reservoirs:

- Technological variants for increasing the fluid filtration area in horizontal holes (HH);
- The technology of horizontal holes surface cleaning from colmatants;
- The technology of acid treatment of the whole horizontal hole (HH) or its calculated intervals, using the unfluxed acid resistant hydrophobic emulsions;
- The technology of horizontal hole acid treatment on the basis of installation of long-length flexible pipe – "coiled tubing";
- The technology of horizontal hole jet-acidizing, using the jet nozzles;
- Technological variants of large-volume selective acid treatment of the horizontal hole;
- Technological variants of water shutoff treatment in horizontal holes on the basis of combined hydrodynamic and mechanical shielding of water influx interval.

The scientific methodological bases of the complex of well stimulation technologies in carbonate reservoirs are the following principles: stepwise, sequential, rational inclusion in the development and exploitation of the entire net pay thickness, and only then - consistent, stepwise implementation of physical and chemical impact over the depth and the length of reservoir beds.

The developed technologies are the base of geological and technical measures to maintain the rate of oil production from the fractured porous-cavernous carbonate reservoirs and to increase oil recovery factor (ORF) by means of deep acid impact on the matrix blocks of reservoirs.

Consistent application of technologies, according to the developed technology, allows to maintain high productivity of wells in operation period, since their input into exploitation.

The increase of wells specific productivity, after implementation of each technology is equal 2-10 tons/day of additional oil production.

Foreign specialists are interested in this complex of technologies. Today, these technologies are developed for systemic impact on strong oil-bearing carbonate sediments at the productive formations of Tajikistan, Turkmenistan and Iran.

The sub-complex of hydrochloride acid treatment technologies in wells with horizontal holes is based on the use of innovative designs, allowing consistently stimulate oil flow at the Partial Execution Mode of chemical compounds injection (surface action). Then selective (directed) impact on the calculated intervals of horizontal holes at a shallow depth is applied, and only at the final stage, directed acid (usually in combination with jetting exposure) deep selective treatment of the payzone is carried out.

The further stage of this approach development is the performing (as the final stage of development) directed (using packer system) acid breaks with the creation of deep cracks and channels network in the payzones, i.e., the most profound physical and chemical, mechanical

action is carried out, with the aim of connecting to the work of remote, undeveloped areas and pillars, dead-end sections.

Thus, the purpose of this complex of technologies is the consistent and efficient bringing into development as the maximum thickness as the length of reservoirs, and due to this effect - increasing the area of drainage, current withdrawal of oil and achievement target figures of the finite oil recovery factor. (Yartiev, 2011).

RESULTS

All technical and technological developments, constituent the abovementioned complex, are protected by patents for inventions of the Russian Federation. Some of them are pioneering in the industry, especially in stimulation of wells with horizontal holes, the number of which in the carbonate reservoir beds of the Republic of Tatarstan is steadily increasing.

Fundamentally new technological variants of stimulation and water shutoff treatment (WST) in horizontal holes (RD 153-39.0-683-10) allow to increase the productivity of horizontal wells by 2-3 times as per oil, while reducing the watercut of production from 90-99% to 20-70% (in various geological and physical conditions of wells exploitation). The extent of industrial implementation of these stimulation technologies and water shutoff treatment at OJSC "Tatneft" was more than 200 well operations.

The sub-complex of stimulation technologies of wells with horizontal holes in carbonate reservoirs (RD 153-39.0-787-12) is implemented with a specific economic benefit 0.9-1.2 mln. rub./well., it is achieved the increase in productivity as per oil in average for 3-4 tons/day. Deep selective acid treatment allows to have growth in flow rate in the range of 5-9 tons/day [10].

Enhanced complex technology of wells stimulation by chemicals (hydrophobizators) of multifunctional action with subsequent limitation of water influxes (RD 153-39-265-02) has received industrial applications since 2000, and the extent of implementation was more than 100 wells, with additional oil production more than 40 thousand tons and economic benefit of more than 40 mln. rub. [10].

The technology of complex shock-wave, implosion and chemical influence on the bottomhole formation zone (RD 153-39.0-291-03 RD, RD 153-39.0-573-08) based on the using of the shock-wave generator original construction has already been applied within 300 wells, with additional oil production of more than 150 thousand tons. [10].

Complex technology of thermobaroimplosion impact (TBII) on the payzone has received industrial application since 1999 and has been applied within 200 wells; the actual economic effect exceeded 60 mln. rubles. (Patent 2082880, Russian Federation).

One of the most important tasks of improving the physical and chemical methods of the bottom-hole formation zone treatment is the achievement of maximum coverage by the impact of reagent (acids, solvents etc.) on the entire perforated thickness of the producing formation.

For bringing into development of payzones and sub-layers with low permeability, it is necessary to ensure the uniformity of thickness formation treatment, by means of redistribution (deviation) of the reactant stream through the tightest formations.

The development of integrated and universal methods and technologies of bottom-hole formation zone treatment is perspective. Their use would be effective as at the opening and development stages, as in the period of wells exploitation.

The optimal sequence of technologies implementation for new wells with horizontal holes is the following (Patent 2039216, Russian Federation):

1) At completion stage:
- The technology of multiply increase the area of fluid filtration to the bottom;
- The rational distribution of packer-stripper system;
2) At the stage of development and start-up:
- The technology of chemical removal of polymer-disperse colmatants from the surface of horizontal hole.
3) In the operational period:
- The technology of cyclical-directed hydrochloride acid treatment of horizontal hole;
- The technology of horizontal hole acid stimulation in the dynamic mode (two recent technologies increase the working length of horizontal hole);
- The technology of horizontal hole jet-acidizing;
The technology of large-volume selective acid treatment (these methods allow to increase the area of drainage in petroleum saturated intervals).

The further stage of this approach development is the performing (as the final stage of development) the directed acid breaks in horizontal holes, i.e., the most profound physical and chemical, mechanical action is carried out, with the aim of connecting to the work of remote, undeveloped areas and pillars, dead-end sections. The main thing at that is the selectivity of the impact, exclusion the occasional treatment of water-saturated, fractured zones.

4) During isolation squeeze jobs:
- The technology of chemical isolation of water influx zones within horizontal holes;
- The technological variants of mechanical shielding (cutting off) fracture, potentially water-bearing intervals of horizontal hole;
- Economically reasoned, complex mechanical and chemical methods of water influxes limitation.

The selection of stimulation technologies for "old" horizontal holes is recommended to make only on the basis of a rigorous analysis of the following aspects (Kazemi, 1969):
- The condition of filtration characteristics of the bottom-hole formation zone and uninvaded zone;
- The changes in dynamics of production water cut, formation fluid withdrawal rate;
- The productivity of the previous types of stimulating effects;
- The condition and dynamics of horizontal hole operating length;
- The distance to oil water contact or injection front;
- The distribution of the fluid inflow on the hole length; the location of the potential and the main zones of water influx;
- The location and prevailing direction of fracture zones along the length of the hole.

Depending on the characteristics, prehistory and condition of the particular object, exploitation of neighboring wells and the condition of the overall development of the analyzed area, the science-based decision is made on the applicability of a particular technology of chemical exposure within the length and depth of the well.

It is especially important to identify correctly the intervals of exposure, the specific consumption of acid, injection pressure, composition and parameters of the process fluids, technical and controlled characteristics of the process, and others.

The optimal complex of acid stimulation technologies for vertical wells includes (at consistent use in the development process) the following points:
- At the stage of wells start-up, it is recommended to make traditional, hydrochloride acid treatment, which may complexing with the methods of secondary opening of the payzones;

- The technology of directed hydrochloride acid treatment;
- The technology of cyclical-directed hydrochloride acid treatment;
- Technological variants of selective injection of acid stimulation compositions KSK-Tatneft;
- The technology of deep hydrochloride acid treatment;
- The technology of large-volume selective acid treatment;
- The technology of acid fracturing of formation;
- The technology of water shutoff treatment in fractured carbonates.

The developed complex of technologies on stimulation of oil wells and increasing the oil production of carbonate reservoirs, systematized in definite sequence, allows to obtain sufficiently high productivity of wells for a long period of exploitation, to engage in the development the entire thickness of carbonate formation, followed by an increase of the maximum length of drainage area.

Technological solutions of the complex may be applied systemically (with maximum effect) or autonomously, within the fields with carbonate reservoirs, depending on the type of reservoir and the stage of development.

Table 3 summarizes the main technical and economic indicators of technological development of the complex. The values of the economic effects during past years were indexed and came to the beginning of 2014. The calculation of financial indicators was carried out in accordance with the RD 153-39.0-620-09 "The directive on the definition of economic efficiency of intellectual activity results implementation" (Pobert, 1983).

Table 3
MAIN INDICATORS OF IMPLEMENTATION OF TECHNOLOGICAL COMPLEX DEVELOPMENT

Technology	Quantity of wells (region)	Specific effect, mln. rub/well	Economical effect, mln. rub.	Oil production increase, tones/day	Incremental oil production, thousand tones
Cyclical-directed hydrochloride acid treatment	250 (Tatarstan, Udmurtia)	0,59	147	2,5-3	165
Deep hydrochloride acid treatment	150 (Tatarstan, Udmurtia)	0,46	52	2,5-3	105
Acid fracture treatment	165 (Tatarstan, Udmurtia)	0,7	116	3-4	204
KSK-Tatneft	800 (Tatarstan)	0,6	480	2-3	450
Large-volume selective acid treatment	80 (Tatarstan)	0,9	72	4-6	120
Bottom-hole treatment by the agents of multifunctional action	103 (Tatarstan)	0,67	69	0,5-2	47
Bottom-hole treatment, complex shock-wave,	300 (Tatarstan)	0,25	75	0,8	250

implosion and chemical influence					
Thermobaroimplosion impact	207 (Tatarstan)	0,47	97	1,6	360
Hydrochloride acid treatment of the horizontal hole with inverted emulsion	60 (Tatarstan)	1,02	61	3	32
Hydrochloride acid treatment of the horizontal hole with coiled tubing	600 (Tatarstan)	0,65	390	2	210
Acid, water jet, hydrochloride treatment of the horizontal hole	70 (Tatarstan)	1,08	76	3	72
Water shutoff treatment in horizontal hole	20 (Tatarstan)	0,58	12	1-5	100 (*)

(*) – The reduction of water cut by 20-70 %

DISCUSSION

Current state analysis of the preservation problem of formation reservoir properties (FRP) of the bottom-hole formation zone in the periods of completion, development, operation and maintenance of wells, as well as a generalization, systematization of bottom-hole treatment technologies and stimulation of wells, allowed to substantiate the promising directions of their development, and to prepare the methodology for their systematic, integrated implementation throughout all technological chain of wells exploitation in carbonate reservoirs.

The analysis shows the following priority of measures (Pobert, 1983):

1. Qualitative opening (primary and secondary) of productive formation. The problem should be solved by means of industrial applications of liquid mud and perforation fluids, the penetrating of which or their filtrates in bottom-hole formation zone does not have a negative impact on the formation reservoir properties (Renard and Dupuy, 1990).

2. The effect, achieved by means of qualitative opening of reservoir, should be maintained in the operational period. This is possible due to the use of special liquids during repair works, having the minimum impact on the reservoir properties of bottom-hole formation zone (Joshi, 1988).

3. The preservation of thermodynamic stability of the bottom-hole formation zone. The following matters are unacceptable:

- Critical depressive-repressive perturbances in this zone of reservoir (the result: permanent deformation of the reservoir, the changes of pore structure for the worse, the decrease of hydraulic conductivity, etc.);

- Supercooling of bottom-hole formation zone (the result: possible setting of organic, asphaltene, paraffin and inorganic colmataging sediments) (O'Neill et al., 2008);

Excessive lowering of bottom hole pressure (the result: coning, water cut of productions, phase transformations, ingress of sand and other negative phenomena).

Foreign companies do not publish the information about water shutoff treatment in horizontal holes. The theoretical aspects analysis of the features of filtration and fluid inflow to horizontal holes, the study of domestic and international experience in the field of stimulation of wells with horizontal holes allowed specialists of OJSC "Tatneft" to develop certain conceptual provisions on the methodology of ensuring and maintaining the productivity of these specific geological and technical facilities at high, potential level.

The integrated approach, management and regulation of the quantity and quality of the fluid inflows to horizontal holes are necessary (Patron and Goldwyn, 2013):

- Qualitative primarily opening of the reservoir with optimally-efficient geometry of deepening and trajectory of the hole with maintaining the natural formation reservoir properties;

- The construction of the well bottom with a maximum filtration area;

- Engineering design of well disposed installation of packers-stripper system, regulating fluid inflow from the fracture zones of horizontal holes;

- Required removal of colmataging components of liquid mud from the wall of horizontal hole;

- The stimulation of fluid inflow from the oil-saturated intervals of horizontal hole or from its all length, and if necessary, carrying out reliable water shutoff treatment with cutting off fractured, usually water bearing intervals;

- The optimization of energy parameters of the inflow process (the optimal balance of reservoir and bottom-hole pressure); in such a way the adjustment of water-free operation and the water content in the product;

- The exclusion of the negative impact on formation reservoir properties of water process liquids during repair operations.

CONCLUSION

Thus, the high-efficiency techniques and technologies complex of stimulation the productivity of carbonate reservoirs of the Republic of Tatarstan has been developed and implemented already today. It based on modern scientific and technological research and experimental-industrial tests.

The authors systematically explored the issues of safety and security protection of workers (Valitov et al., 2012); developed a set of technical devices for environmental protection measures during the period of repair and stimulative operations; researched the processes of de-emulsification, taking into account the industrial implementation of new technologies without damage and impact on the quality and preparation of oil wells production.

In general, developed technical and technological solutions were implemented within more than 2,800 oil wells in the territory of the Republic of Tatarstan with a total economic effect of about 1.7 bln. rubles.

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FEATURES OF NONEQUILIBRIUM ECONOMICAL SYSTEMS EVOLUTION

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ABSTRACT

The purpose of the paper is to study the problematic issues of nonequilibrium economic dynamics and accompanying negative effects, and to elaborate proposals for their mitigation. The study is based on the use of modern approaches, including the bifurcation analysis and methods of systems self-organizing (synergy). The analysis is carried out on the example of the Russian economy. It is shown that in the course of planning period of its development, the main negative aspects were unbalanced structure of the national economy and preferred orientation on primary industries. Contrary to forecasts, upon transition to the market economy, those negative aspects were supplemented by the deterioration of the institutional structure that was one of the main causes of the negative trends in the macroeconomic dynamics due to increased non-compliance of the structure with the objectives and objectives of economic development in the market conditions, and regular economic crises. The result was preservation of raw materials export model, and the economic slowdown, destruction of the production sector, reducing the competitiveness of the economy and as a consequence, the possibility of increasing the human wellbeing. Among the proposed measures: reorganization of the institutional structure of society; change the economic growth model; implementation of projects with a large multiplier effect, and others.

Keywords: Evolution; economic imbalance; bifurcation; self-organization; randomness; self-similarity; economic growth; macroeconomic dynamics; dynamic (deterministic) chaos; raw materials export model; innovations; investment policy.

INTRODUCTION

The evolution of non-equilibrium economic systems goes by the rules and laws different than those follow from the general equilibrium model. Their dynamics is non-linear, more complex, and poorly predictable. It is characterized by random fluctuations which determine the occurrence of stochastic processes intertwined with economic cycles of various length. They are imposed in addition by global rhythms of change of technological modes and "instability pushes", generated by the development of entrepreneurial initiative (Schumpeter, 1974) what in turn sets the contradictory nature of economic growth and makes the study of the problem particularly urgent.

The point of view is very common according to that the disequilibrium state is a relatively short-term violation of development stability which soon gives way to a new equilibrium. In reality, the situation is more complicated. Numerous studies of both domestic and foreign scientists suggest that these states can be stably continued without visible changes in many years and decades.

Already G. Sayman has developed the new model of economic behavior based on the

principle of bounded rationality and took into account its non-linear character (Simon, 1959). Developing these ideas, R. Selten has entered several levels of decision-making by economic entities: habits, imagination, and logical reasoning by which they are guided in real life, instead of maximizing principle (Selten, 1990). Finally, H. Leibenstein has considered rationality of an economic entity not just as limited, but also as a variable value (Leibenstein, 1976). All this has allowed better and more fully understand the characteristics of non-equilibrium economic systems.

Economic evolution was reshaped by R. Nelson and S. Winterm (Nelson and Winter, 2009) who have represented it as the reaction of companies to changing environmental conditions. This reaction consists in the corresponding change in their rules of conduct (routines), i.e. in adapting to the environment which allow minimizing transaction costs and obtaining acceptable results.

In non-equilibrium systems, there are their own, inherent for them self-regulation and self-organization mechanisms to ensure formation of special kinds of internal order, for example, the type of a stable boundary cycle. This dynamics topologically corresponds to phase trajectories in the form of a spiral twisted around a stationary point, and the development of the system occurs in the form of non-damping self-oscillations about the equilibrium position which is never reached (Fig. 1).

Figure 1
PHASE TRAJECTORIES OF A BOUNDARY CYCLE IN THE VICINITY OF A STATIONARY POINT
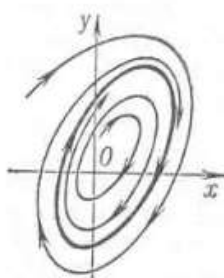
Formed orderliness may correspond to other topological structures, such as an unstable focus or unstable boundary cycle which trajectories are a divergent beam from a point, or unwinding spiral, respectively. This cycle, in particular, has been presented in China's economy in the 1970s, and Russia in the 1990s (Nikolaev, 2013).

An interest to the problems of the non-equilibrium dynamics was particularly increased in the last 1.5 - 2 decades when the Eastern European countries started to move to market economy. Their economic systems, in particular in the Soviet Union, remained for a long time in a state of pronounced imbalances that manifested itself in structural disparities, shortages of goods, in low susceptibility to different types of innovations (Khalabuda and Nikolaev, 2014; Postalyuk et al., 2013), and the growing imbalance. However, market economy did not solve all problems, and sometimes amplified them. It certainly testifies that the transition actually meant only a successive replacement of organizationally and structurally stable type (mode) of imbalance to similar other one.

Such a succession of individual types of economic imbalance is inherent not only to the former socialist countries, but also to any other countries that increases the importance of

research.

METHODS

The bifurcation analysis method is used as the main method, taking into account that a change of topologically non-equivalent types of economic imbalance occurs only through the bifurcation. Some of the concepts of synergetic theory and elements of nonlinear dynamics theory are also used.

In relation to the economic system, bifurcation means divarication of the trajectory of its development in separate branches. In addition, each branch corresponds to such a variety of new possible directions of evolution (Fig.2). Bifurcation occurs if the value of the bifurcation parameter λ (accumulation of quantitative changes in the system) reaches a critical value X: $\lambda> =$ X. When $\lambda < X$ bifurcation is absent.

Figure 2
AN EXAMPLE OF A DEVELOPMENT TRAJECTORY BIFURCATION (BRANCHING)
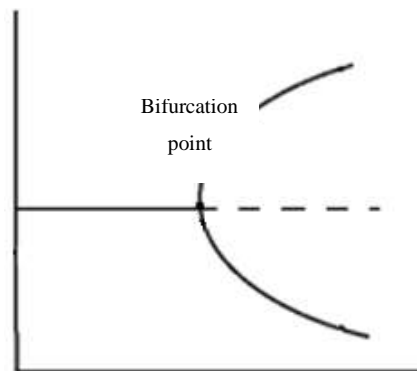
In the vicinity of the bifurcation point, the alternatives are close, but then quickly diverge, and the state of the system immediately changes to a different quality and subsequent movement is carried out already at another trajectory. Although it is impossible to predicte what kind of branch it will go by, since it will be determined by chance. In the socio-historical approach, the bifurcation points correspond to the moments when the challenges of history appear. So, M. Shermer believes that in these points a randomness gets a chance to change event direction (Shermer and Grobman, 2000), and J. Toynbee suggested that there is a social demand for the great personalities whose activities are capable of quickly and unpredictably change the course of events (Toynbee, 1934).

Some remarks on the method used:

1) An accident which determines transition of the system in the point of bifurcation to the other path can be not only a particular action of a great personality, but his/her accidental death. So, V.O. Klyuchevskiy having analyzed the Time of Troubles (the most difficult period in the development of the Russian state after the death of Ivan the Terrible who left no heirs) stressed that the Time of Troubles was caused by the random event, or extinction of the Tsar dynasty (Klyuchevskiy, 1988);

2) In the economy, in contrast to physical or mechanical systems, nothing happens immediately. In this sense, a bifurcation point should here be understood as a kind of turning

point, a moment of awareness of the historical inevitability of changes launching the logical chain of subsequent transformations. The changes themselves generally last for a very long time. For example, the Time of Troubles took 15 years, the transitional period after the October Revolution in 1917 about 20 years, and the transition to the market economy in modern Russia continues for nearly 30 years;

3) As it follows from the theory of nonlinear dynamics, after passing through the bifurcation point an economic system is in a deterministic (dynamic) chaos state. It is characterized by a particularly high sensitivity to a change in the initial conditions when any and as a whole minor fluctuations in macroeconomic dynamics, which could have no effect on the course of economic evolution in normal circumstances, in conditions of the aforesaid period may unexpectedly lead to a radical change of trajectory, up to return to the previous way of development.

RESULTS

Let's consider the following bifurcation diagram (Fig. 3).

Values of technological development level of an economy are plotted hear on the axis T, and time as the bifurcation parameter on the axis t.

Figure 2
THE BIFURCATION MODEL OF THE RUSSIAN ECONOMY EVOLUTION
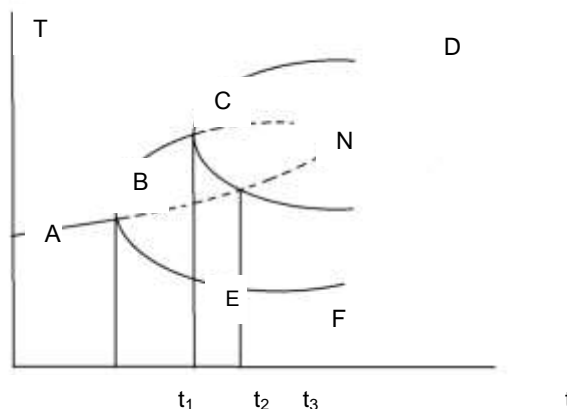
A part of the trajectories is shown in solid lines, and some of them are dashed. The former correspond to stable states in the development of systems that are or were realized at one time, or could be realized, while the dashed are unrealizable or unstable states which are being destroyed in the bifurcation points, but continue to exist in the theories and the public consciousness, and thereby indirectly retain their influence on the macroeconomic dynamics of the system as a whole. At the points where the stable and unstable branches intersect, their so-called annihilation occur that corresponds to a sharp quantum leap in the system.

The trajectory section AB corresponds to the period in the Soviet economy before the start of the industrialization program. Point B is a point of bifurcation which opened two alternative possibilities for further development. An alternative represented by BC section corresponds to a period of rapid industrialization, and BE section corresponds to an acceptable, but not realized then possibility of transition to the industrial branch in more suitable conditions

at the expense of pre-building the necessary capacities for this by increasing the production of agricultural and commodity sectors.

Given that the country has selected the first path, since 1925 - 1926 development along BC branch began. In light of the above-mentioned on the role of the great personalities in bifurcation points, we cannot exclude that this choice was due to the death in 1924 of the state founder Vladimir Lenin, immediately after that there has been a radical change of priorities in the economic policies carried out further by I.V. Stalin.

The course taken was immediately aimed at accelerating the development of heavy industry, especially machinery manufacturing which was attributed to the need to eliminate the technological backwardness of the country, growth of labor productivity and the subsequent implementation of large-scale social programs on this basis. The results have been mixed. On the one hand, for the period from 1928 to 1940, the annual growth rate of industrial production amounted to about 10 - 14%. During that time, 9 thousand new manufacturing enterprises have been put into operation, and new industries were created: automotive, aviation, tractor construction, machine tool building (Gaidar, 1997).

On the other hand, there have been drawbacks. Firstly, there evolved a badly balanced structure of the economy in the country with an excessively developed heavy industry and underdeveloped light industry and agriculture. The plans that the created industrial sector itself would ensure accelerated development of all other sectors of the economy didn't work out. This logic was not applicable to systems with non-linear relationships. Hypertrophied industrial sector began to rapidly degenerate into a self-devouring system to absorb more of what it had have produced.

Secondly, by the mid-1970s, impossibility to fulfill scheduled tasks to increase efficiency of management system became apparent and its shift to raw material production type began, and the main priority in the investment policy became oil and gas production. This reorientation took place in the conditions of increasing cyclicality of development which was observed though less pronounced than in the market systems, also in the Russian economy, and in other socialist countries (Abramov, 1990).

These processes have been imposed by changes in the technological structure reinforcing multistructurality of the economy which has gained more and more pronounced features of disequilibrium and, by the mid-1980s, closed to the new bifurcation point (the point C in the diagram). This bifurcation took place at the beginning of M.S. Gorbachev's reforms which purpose was to transfer the system to industrial development trajectory (CD branch in the diagram). However, the inertia of the previously existing self-organizing mechanisms pushing the economy to the raw extracting branch CN was so strong that the objective was not achieved. The self-similarity (or fractality) property of complex systems (Mandelbrot, 1982) acted in the same direction; being applied to economic structures it means (to a first approximation) repeating at every new stage of development (when changing the type of imbalance) the same of its basic characteristics, although in new concrete historical forms. In Russian system, they are, first of all, the dominance of a government institution, and particularly high role of informal relationships in the socio-economic life as opposed to the formal ones. Adjustment of all other economic relations under these characteristics occurs when changing the type of imbalance. Self-similarity property is unnoticed in the context of stable development, but manifests itself visibly at the bifurcation point and subsequent transformations being a factor which hinders transformation (Nikolaev, 2005).

Thus, at time t_3 the point of annihilation of N has been passed, after which the country

already began to develop according to the laws of predominantly agrarian and raw material extraction system. However, this development is contradictory. By mid-2000, the country gradually came to a positive growth rate, but since 2007 to the present time, the situation started to deteriorate again (Table 1).

Table 1
DYNAMICS OF SOME MACROECONOMIC DEVELOPMENT INDICATORS IN THE RUSSIAN FEDERATION FOR 2007 -2015

Indicators	Years								
	2007	2008	2009	2010	2011	2012	2013	2014	2015
GDP growth rate, %	8.5	5.2	-7.8	4.5	4.3	3.4	1.3	0.6	- 3.8
Growth rate in the industry, %	6.8	0.6	- 9.3	8.2	4.7	2.6	0.5	1.4	- 5.5
Growth rate of investment in fixed assets, %	21.1	9.8	- 16.2	6.3	10.8	6.6	- 0.3	- 2.5	- 10.2
Export change, %	11.9	32.7	- 35.7	33.3	30.4	1.1	- 0.1	- 5.6	- 32.1

Note: compiled by the authors based on (http://investorschool.ru/vvp-rossii-po-godam; http://delonovosti.ru/business/3240-promyshlennoe-proizvodstvo-prodolzhaet-padat.html).

The table shows that for the period 2007 - 2015 GDP growth declined from 8.5 to -3.8%, in industry from 6.8 to -5.5%, increase in investments in fixed assets fell from 21.1 to -10.2%, export dynamics has slowed in dozens of times.

Particularly worrying is the fact that the deterioration of the macroeconomic dynamics occurred (at least until 2013) with sustained high oil prices and other raw materials. And it shows not just the high dependence of the economic dynamics on the price factor in energy, but strategic miscalculations in the selection of a general model of management and economic growth that acts not in the direction of stabilization, and to deepening the existing imbalance mode.

CONCLUSION

Studies have led to the following conclusions.

1. The dynamics of nonequilibrium systems is a complex interrelated processes of alternation of stable and unstable development periods alternating by bifurcation points and areas where the natural course of evolution is greatly disturbed what leads to a change from one imbalance mode to another. With this in mind, the main direction of improvement of macroeconomic dynamics is seen in the transformation of the institutional structure of the Russian society to mitigate the dominance of government institutions and informal relationships which action leads, inter alia, through the self-similarity mechanisms to actual degradation of the body of laws and rampant corruption, to the degeneration of democratic institutions, institutions related to the development of human and intellectual capital, and in the end to the preservation of obsolete economic growth model based on raw materials export. This transformation appear even more so necessary because, firstly, the next round in strengthening of those dominant institutions today is obvious. Secondly, in any case, for each of the periods of a non-equilibrium economic system evolution there should be developed its own model of economic growth aimed at mitigating the cyclicality and stabilizing its structure.

2. The danger of continuing today utilization of raw materials export model which also does not take into account the non-linear nature of relationships in a nonequilibrium system as the industrial policy in the Soviet Union before, is not only a reorientation of resources in not

very promising sector of the economy, but also in the fact that, unlike the development of industrial branches, following the classical laws of evolution according to which the crisis follows by restructuring the system, crises in raw branches are generated by external factors: global market fluctuations in energy prices and instability of world politics. They usually do not lead to any restructuring and hamper the economy susceptibility to any type of system innovations, ultimately deepening the overall disequilibrium even more. Continuing movement along this branch is fraught with another bifurcation, and the transition to a new system of quality becomes a reality. However, it is impossible to predict at what branch such a development will go and with what new privations it is connected.

3. The improvement in the macroeconomic dynamics is in one or another degree possible with the use of more particular measures: the implementation of projects with a large multiplier effect that can give a new impetus to economic development and to ensure industrial growth; a radical improvement in the business climate to enhance entrepreneurship and increase the inflow of investments, and others. However, it is important that they were linked by common strategic idea, and did not have the nature of single one-off events.

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TRENDS IN THE TAXATION OF PERSONAL INCOMES AND THEIR IMPLICATIONS OF BUDGET

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ABSTRACT

The priority directions of fiscal relations in the Russian Federation assumed the formation, rational allocation, and efficient use of financial resources, fiscal safety and minimization of fiscal risks.

The aim of this study is to identify trends in taxation of personal incomes and justify proposals for the further reform of the tax system to ensure sustainable economic growth in the Russian Federation and mitigation of social differentiation and stratification.

The article pays special attention to the rate of taxation of personal incomes applied in the Russian Federation. A retrospective analysis of flows of tax on personal incomes in the revenues of the consolidated budget of the Russian Federation for a number of years was carried out. It is concluded that the potential of the tax on personal incomes in the current tax system in Russia is not fully implemented. The article describes the positive and negative sides of both proportional and progressive tax rate. The authors concluded that the reform of the tax of personal incomes in the Russian Federation is necessary.

The study used historical, structural, functional and institutional approaches; the information base of the study were the tax legislation of the Russian Federation, official statistics, Russian and foreign scientific publications, as well as information posted on the Internet.

Keywords: tax on personal incomes, proportional rate, the progressive rate scale, non-taxable minimum, budgetary implications.

INTRODUCTION

Tax on personal incomes is one of the economic instruments of the state, by means of which issues of fiscal and regulatory nature must be dealt with, but it does not fully meet the realities of today. For the entire history of its existence in Russia, the tax on personal incomes has undergone significant changes, and firstly issue of its administration came up in 1907, and is being discussed by politicians and the scientific community until now. And since a flat rate of tax on personal income was introduced instead of the pre-existing progressive tax rate, this issue has become even more urgent.

Currently, the tax on personal income affects the interests of all layers of the economically active population without exception. This tax has a pronounced social character and has a great potential impact on the level of real incomes of the population, and thus the level of life of people, and it allows with the use of the system of benefits and tax rates to adjust

personal incomes. Also, the tax on personal incomes may adjust the current level of personal income differentiation, and the level of tax burden on the poor. In Russia, tax on personal income is one of the main sources of budget revenue of the state budgetary system. But as practice shows, this tax is far from corresponding to the level of similar taxes in developed countries, neither by the extent of achievement economic efficiency, nor by compliance with social justice in its application.

Thus, the study of this topic is of particular interest, since in recent years the role of the tax on personal incomes and its impact on the living standards in Russia has changed; a critical question on the reform of the tax has come up in order to comply it with justice and equity in the taxation of the population.

It should be noted that income taxation issues are studied by Russian and foreign economists. In particular, these list of investigators include Saez, E. (Saez, 2013), Hodgson, H. (Hodgson, 2014), Pellegrino S., Vernizzi, A. (Pellegrino and Vernizzi, 2013), Ibragimov M., Tufetulov A.M. (Ibragimov and Tufetulov, 2014), Sabitova N.M., Dyudina M.P. (Sabitova and Dyudina, 2014).

THEORY

Currently, the tax on personal income is used in the tax systems of many countries. In most countries, a progressive scale of tax rates on personal income is applied. The progressive scale of rates existing in many countries is usually complex and stepped, i.e. income in such a scale is divided into parts, each of which is provided with its own rate. In some countries, the income is divided into many parts, and so the transition from one group to another is carried out gradually and smoothly. In others, progress has a step-wise character. To date, in Russia 13% flat tax rate on personal income is applied.

In the taxation system of the Russian Federation, tax on personal incomes is one of the main tax sources for state budget replenishment. It is in effect throughout the country, is charged by the state directly to incomes of taxpayers, is used to control incomes of lower level budgets in the form of percentage allocations according to the norms approved in the prescribed manner for the next fiscal year.

In Soviet times, income tax revenues in the incomes of the state budget of the USSR which included the budgets of all levels of state power, accounted for a very small fraction less than 5-6%. This tax did not have a significant impact on a financial situation of taxpayers in the absence of substantial income differentiation. Under these conditions, the established progressive tax scale affected the interests of a very small number of taxpayers, and therefore the vast majority of the population paid the tax at the minimum rate.

In the 90s, the share of income tax revenues in the consolidated budget of the Russian Federation remained at a low level (Figure 1).

Figure 1
THE SHARE OF THE TAX ON PERSONAL INCOMES IN THE INCOME OF THE RUSSIAN FEDERATION CONSOLIDATED BUDGET, PERCENTS (HTTP://WWW. GKS. RU)
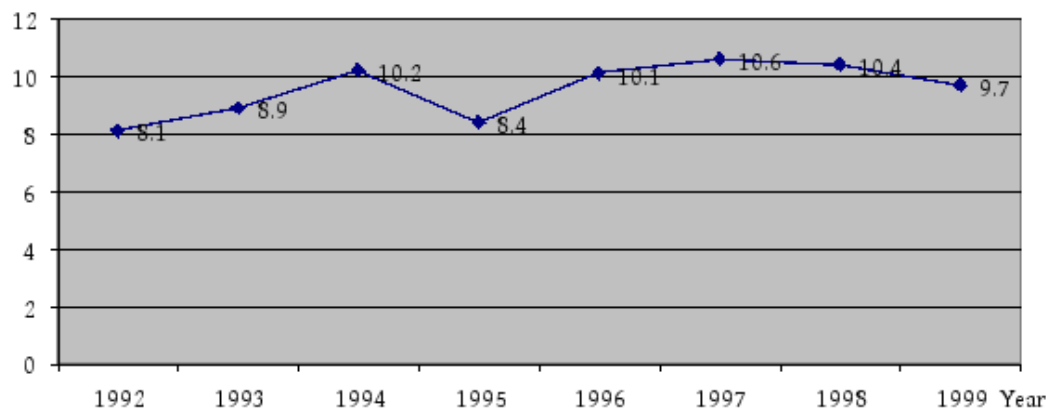
Reform of the tax on personal incomes carried out in 2000, was primarily in the abolition of the progressive tax scale, establishment of the uniform, flat rate at a level close to the lowest maximum rate of the previously applied scale, reduction of benefits and simplification of tax collection and payment procedures. Before the reform, the role of the income tax in the tax system of Russia in comparison with both the industrialized countries, and with the most successful economies in transition was very low. In most developed countries and transition economies, the share of income tax in total tax revenue varies from 20-35%, whereas the corresponding figure in Russia fell almost to 6.5% by 2000.

There are several main reasons which determined the low fiscal significance of the income tax in the tax system of Russia at the stage until 2000. These include low population income, complexity of the legislation, and the large number of exemptions from income tax, poor administration and, consequently, exodus of taxpayers.

As to the influence of the low standard of living and low incomes of the population on the return and collection of income tax, we should note that maladjustment of the tax administration to the economic situation of recovery growth in the period 1999-2000 made it impossible to collect effectively taxes on incomes other than wages, and such incomes to a large extent fell out of the personal income tax base. At the same time the opportunities for tax evasion for taxpayers with high incomes and high tax rates for them led to that the main burden of the income tax fell on taxpayers with low and middle incomes that worked at the enterprises where it is difficult to practice widespread illegal forms of payment for labor.

Thus, the most important tasks of the income tax reform were a need to improve the fiscal role of the income tax in the budget system and a need to promote the legalization of incomes, especially for taxpayers with high incomes. In addition to the above, it was assumed that as far as much of the taxpayers with the highest income evade taxes, the introduction of a flat income tax rate should not lead to a significant drop in tax revenues. On the contrary, it was assumed that the incentives to legalization could lead to expansion of the tax base due to the legalization of high incomes and thus to an increase in equity of income tax.

Upon the adoption in mid-2000 of the Chapter 23 of the RF Tax Code "Tax on personal incomes" provisions of the income tax reform have been approved. An important result of the

reform of the tax on personal incomes in 2001 was the transition to a proportional tax rate and a steady increase in revenues from this tax. The dynamics of income is presented in Table 1.

Table 1
DYNAMICS OF THE TAX ON PERSONAL INCOMES IN THE INCOME OF THE CONSOLIDATED BUDGET OF THE RUSSIAN FEDERATION (http: // www. roskazna. ru)

Year	Total revenues of the consolidated budget of the Russian Federation, in billion rubles	Revenues of the tax on personal incomes, in billion rubles	The increase in income tax revenues,% to previous year
2000	2098	174.8	-
2001	2684	255.8	46.34
2002	3519	358.1	39.99
2003	3985	455.7	27.25
2004	5348	566.9	24.40
2005	8623	707.1	24.73
2006	10689	930.4	31.58
2007	13250	1266.6	36.13
2008	16169	1666.3	31.56
2009	13615	1665.8	-0.03
2010	16031	1790.5	7.49
2011	20855	1995.8	11.47
2012	23088	2261.5	13.31
2013	24082	2497.8	10.45

According to Table 1, the analysis of tax on personal incomes in the consolidated budget of the Russian Federation for 2000-2013 years shows that the application in 2001 of 13% tax rate resulted to an increase in tax revenues.

Thus, since 2000, tax revenues from taxes on personal income increased, but its share has not changed much, remaining at the level of 8.33% of the total income. In 2000, the Russian government has decided to carry out a radical reduction of tax rates on personal incomes. At low significance role of the income tax in the total revenues of the budget system of Russia all of its revenues accounted for approximately 1/5 of the tax revenues into budgets of Russian regions and municipal entities. Accordingly, the regional authorities could be feared that decrease in highest marginal income tax bracket may result to a reduction in revenues of their budgets. However, the fact that the amount of evasion has reached an extremely large volumes (due to socially unacceptable for Russia the level of the nominal tax burden on personal income and the lack of real administrative mechanisms to fight with this evasion) led eventually to an understanding of the need to reduce the rate of income tax as an important condition of legalization of shadow incomes. In this regard, an expectation of increasing the tax base and, as a consequence, the budget revenue growth was the main reason to support such changes in the regions. On January 1, 2001 flat income tax rate of 13% was introduced.

The introduction of a single tax rate in 2001 was accompanied by the growth of the collection of income tax and increase its share in the total revenues. In 2001, income tax on personal incomes increased by 81 billion rubles, compared with 2000. At first glance, it can be assumed that the idea that the maximum tax rate is only 13% had a beneficial effect upon the

population resulting in increased both the collection of the tax and, consequently, the effective tax rate. In 2001, there was money income growth of population in real terms that amounted to 9.68% compared to the 2000 level, while the growth in the tax on personal incomes was substantially higher - 19.77%. Between 2000 and 2004, the share of the tax on personal incomes had positive growth (in 2000 - 8.3%, in 2001 - 9.5% , in 2003 - 10.2%, in 2002 - 11%, in 2004 - 10.6%), while at the same time the tax revenues to the Russian budget system have increased, too, due to the effect of the tax reform and the general rise of the economy during that period. In 2006, the share of the tax on personal incomes decreased and amounted to 8.7% of total revenues. The reason for this phenomenon was that most of the real income of the population was in the "shadows". The share of the tax on personal incomes in the income of the Russian Federation consolidated budget for 2000-2013 years was about 10%. It should also be noted that, despite the financial crisis of 2008, the revenues from the tax on personal incomes in the income of the consolidated budget of the Russian Federation has not being decreased. (Sevryukova and Belousova, 2016)

Thus, we can say that since 1991 to the present time the tax on personal incomes has undergone many changes due to the change in tax rate, the tax reform in 2001, and the growth of the tax base. The period since 2000 is characterized by the growth of revenues from personal income taxes, increase in its proportion in the consolidated budget of the country, and the relatively positive dynamics. However, any reforms aimed at changing the tax on personal incomes must not only have an economic component which manifests itself in the possibility of authorities to collect additional funds in the budget, but also to stay a way for execution of social obligations of the state to the country's population. (Nemirova and Tyurina, 2015)

METHODS

The current system of taxation of personal incomes is not perfect. This is largely due to the fact that during the reforms, the changes made in the income tax mechanism did not have a systemic nature and were caused by populism and the need to address the current challenges. In terms of revenues in the consolidated budget of the Russian Federation, tax on personal incomes ranked third. Revenues to the consolidated budget of the Russian Federation from that tax grow every year. This result is achieved due to the following factors: innovations in the legal framework; the total volume of production and sales; specialization of regions by sectors of the economy, peculiarities of the placement and operation of the main sectors of the economy; the population size of regions, the proportion of the urban population; migration of major budget revenue generating taxpayers; the level and dynamics of wages; raising the minimum wage; reduction in the number of unemployed people in the country; reduction in the number of wage arrears.

Despite the positive changes in the sphere of incomes and living standards of the population, high differentiation of the population by income level remains. Years of radical reform of the Russian economy were accompanied by a fall in living standards of the main part of population and large-scale concentration of incomes in the hands of a relatively narrow segment of society. Justice in a market economy is achieved by that a part of incomes which belong to the richest strata of the population is redistributed to the poor. And one of the main instruments for implementing government policy to redistribute income between different social groups is the taxation of individuals. At present, we can say that the principle of fair taxation of incomes is not respected. This is evidenced by the flat tax rate for all taxpayers. At this stage,

there is a challenge to the state. On the one hand, the need to improve the welfare of the population that implies a reduction in tax rates and expansion of the list of tax benefits. On the other hand, the need to increase tax revenues to the budgetary system in order to improve the social sphere. In this situation it is necessary to achieve a balance in the tax system, that is, to achieve effective performance of the functions of all taxes.

Russian society is characterized by a high degree of separation between the rich and the poor that is recognized at an official level and is one of the most pressing social problems. One of the reasons of this "imbalance" is "flat" income tax rate, the usefulness of which is in doubt. The introduction in 2001 of the flat rate of the tax on personal income was substantiated by stimulating an exit of super profits from the "shadow", i.e. the legalization of personal incomes, and thus the increase in tax revenues to the state budget. However, the flat tax rate is unfair in essence because it does not take into account the imbalance in the personal incomes. The flat rate has lead to that individuals which draw large incomes through the use, in most cases, natural resources being a national property, are burden with less serious tax liabilities rather than citizens with low and middle incomes. (Pega et al., 2013)

International experience shows that the flat rate tax of personal incomes is almost never used. On the contrary, progressive taxation of personal incomes is widespread. Upon that, progression reaches high values. Using a progressive tax scale is an indicator of a sufficiently high level of the economy, and it is not for nothing that this system has been applied in most countries.

The need to introduce a progressive scale of taxation is currently due to three factors. Firstly, the world practice shows that the flat tax scale is the lot of backward countries with weak economies which are not able to effectively administer and collect taxes.

The second reason for the introduction of a progressive tax scale is a sharp decrease in budget revenues of the Russian Federation threatening their financial stability. During the last 10 years the dependence of the regions on financial transfers from the federal government has increased.

Third reason is the rapid growth of the Russian society income stratification degree.

Recently, the need to introduce a progressive scale of tax on personal incomes is actively discussed. There are different points of view on this issue. We may point out three main versions published in domestic media on how the introduction of a progressive tax scale could affect the Russian economy:

1. Rebound the national economy. Supporters of this version claim that Russia's transition to a flat income tax was justified and effective, but a return to the old, differentiated system could return the country to the state of seven years ago.

2. Lead to positive dynamics. This version is based on the experience of the Western countries where progressive taxation scale has established itself as a very effective means of leveling social inequalities.

3. Will not affect qualitatively on the development of the country. According to some experts, no significant changes in the Russian economy in connection with the adoption of a progressive scale will not happen. Cancellation of the tax for the poor would slightly improve their position; the middle class will continue to pay tax at approximately the same rate; and the funds that are planned to get from tax revenues of the rich, will not be so significant.

Proponents of proportional taxation say that the proportional rate ensures the fairness of the tax: the amount of the tax varies according to changes in income. However, Russia has Europe's lowest income tax for the rich and the highest income tax for the poor. Opponents of

progressive personal income taxation offer another model for seizure of incomes from the most well-fixed part of the population.

RESULTS

On the basis of the study the following practical recommendations could be pointed out in order to increase the role of the tax on personal incomes in the income of the budgets of the Russian Federation budgetary system.

Firstly, it is necessary to organize a gradual transition to a progressive scale of tax rates on personal income. Drawing on the experience of foreign countries, it is advisable to introduce a progressive scale of tax rates on personal income in Russia. However, at the initial stage a multi-level scale of tax rates on personal income should not be used. It is necessary to use experience of the countries which have similar to Russia socio-economic level and to set such rates of income tax for individuals which will fairly increase the tax burden on large incomes.

Secondly, it is necessary to establish the exemption limit at a level not lower than the subsistence minimum.

Thirdly, a gradual transition to a qualitatively new level of tax administration should be implemented in parallel to the transformation of the scale of tax rates which is a fundamental element of the new income tax system. To do this, it is necessary to arrange the database with maintenance of documentation with information for each taxpayer and availability of access of the tax authorities to the data recorded by other authorities. Also, it is necessary to establish an effective control over large expenditures of the population, as it is done in other countries to combat tax evasion.

Fourthly, in the longer term it is expedient to transit to family taxation under which the income of married couples is aggregated and taxed at favorable terms.

CONCLUSION

Thus, it is suitable to adjust the mechanism for calculation and payment of tax on personal incomes, increase a level of tax literacy of the population, give taxpayers the right to use tax "on a household income", to define and justify institutionally economic mechanisms for effective tax control over the ratio of personal tax and expenses, including undeclared incomes and costs.

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MODELING THE INVESTMENT DYNAMICS IN THE FIXED ASSETS IN THE REGIONS OF THE VOLGA FEDERAL DISTRICT

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ABSTRACT

The economic status and well-being of the country's development is characterized in general by such an important indicator as the degree of investment activity. The investment activity of the country and its constituent regions affects primarily an improvement of the productive base of the state's economy.

In recent years, the particular hopes for the future development of the state are inextricably linked in general with the formation of an innovative economy, in which the profit is generated by the material production.

The article defines the content and structure of "innovation lift" as an aggregate of development institutions, which carry out the state support of innovation activity of business entities in the Russian economy; analyses the measures aimed at improving the effectiveness of control and coordination mechanisms of innovative activities; investigates, using the methods of economic-mathematical modeling, the business infrastructure development indicators in the regions of the Volga Federal District (VFD) in 2013-2014; identifies the key factors that determine the investment level in the fixed assets at the municipal level; makes conclusion on the need to implement an effective business infrastructure control at the regional level while ensuring the investment growth platform in the fixed assets.

Keywords: Development institutions, business infrastructure, innovation activity, regional economy, municipal units, investments in the fixed assets, the Volga Federal District, state regulation of business activity.

INTRODUCTION

The "innovation lift" is an ecosystem of the development institutions engaged in the state support of innovation activity of the business entities. The main objective of "innovation lift" is to support the projects aimed at implementing the targets of socio-economic development of the Russian economy. Since the financing of such projects is associated with the increased risks, the development of methodological approaches to the assessment of the dynamics of investment expenditures undertaken using the tools of public-private partnerships, as well as the justification of tools of the state regulation of innovative activity of business structures have both the theoretical and practical importance at the regional.

The methodological basis is represented by the provisions of the regional economy and regional development theory, investment theory, business economytheory, etc. We used the

general scientific and specific research methods in the study, including the economic-mathematical modeling methods and statistical data analysis methods.

The information base of research is represented by the information of official federal and regional statistical agencies of the Russian Federation and foreign states.

Results

In the current Russian economy the main structural elements of "innovation lift" include OJSC "RVC", OJSC "RUSNANO", the Infrastructure and Educational Programs Fund, "Skolkovo" Fund, Vnesheconombank (VEB), "VEB Innovations" Fund, JSC "EXIAR", JSC "Rosinfocominvest", the Russian Bank for Small and Medium Enterprises (SME Bank), the Fund for Assistance of Development to Small Enterprises in the Science and Technology Sphere (Innovation Assistance Fund), the Industrial Development Fund (FGAU "RTDF"). A significant role in the development of Russian innovation system is played by the Agency for Strategic Initiatives (ASI), the Internet Initiatives Development Fund (IIDF), the Russian Venture Investment Association (RVIA), the Association of Innovative Regions of Russia (AIRR), the Moscow Exchange Trading Platform for the High-Tech Companies "Innovations and Investments Market", as well as the regional venture funds, the non-governmental organizations ("OPORAROSSII", "DelovayaRossiya", AP KIT, NP "RUSSOFT", "NP "RazumnyGorod") and a number of other organizations.

The geopolitical situation of the present time data updates the competitiveness of industrial production as an essential factor in ensuring the strategic security of the country. At the initiative of the Minpromtorg (Ministry of Industry and Trade) of Russia in order to enhance the global competitiveness of the Russian industry and to implement the import substitution policy in 2014, the Russian Fund of Technological Development has been reorganized into the Industrial Development Fund (EDF), the main task of which is to overcome some of the limitations of the banking system and to ensure the enterprise access to medium-term loans (http://frprf.ru/o-fonde/). The Fund offers favorable conditions for the co-financing of projects aimed at the creation of new high-tech products, technical re-equipment and establishment of a competitive production on the basis of the best available technologies.

In order to implement the industrial and technological projects of the Industrial Development Fund, there are available the targeted loans in the amount from 50 to 700 mln. roubles for a period up to 7 years and at a rate of 5% per annum on a competitive basis. Making profit is not included in the Fund's objectives, and the existence of interest rates is due to the formation of reserves. The rate amount may be revised depending on the economic situation, the level of loan delay in the industry, as well as the demand from the corporate sector once a year. Each project shall be examined for compliance with the criteria established by the Industrial Development Fund. The credit funds are not available to the first-time entrepreneurs, as well as for the construction and operating activity. The priority is given to the development of industry-leading entrepreneurs: the main recipients of funds are the entrepreneurs engaged in their activities in the market for over three years, which have their own engineering or engineering company-partner, and use the advanced technologies in the implementation of projects.

The applicants are offered several concessional lending programs on their own choice. One of them is focused on debt financing of the projects of import substitution and production of competitive products. In this case, the loan size will not exceed 70% of the total project budget, and the possibility of its maintenance should be certified by the obligations of the project

partners - the borrower, the co-investors or the banks. The conditions of the second program include lending the final stage of product development and feasibility study of the projects that requires interest of the banking institutions in the financing of further steps, for the purposes of which the results of the pre-investment study undertaken by the fund shall be provided. The condition of the third program is lending of the pre-investment stage of the project. The final program - debt financing of the consortia projects ensuring the development of technologies, their further adaptation and implementation in the enterprises.

In June 2015 it was recorded the receipt of more than 900 applications by the Fund for a total amount of over 330 bln. rubles. The applicants from Moscow, Sverdlovsk Region, the Republic of Tatarstan and Moscow Region were the most active. Five leaders by industry are as follows: mechanical engineering, chemistry, metallurgy, electrical equipment and electronics. The Expert Council of the Fund selected the first 12 projects, some of which have already received their funding. The loan amount on them will be 3.6 bln. rubles. The total volume of direct investments attracted to the economy of the country through the project implementation, taking into account the amount of loans, will exceed 9.9 bln. rubles. The Expert Council of the Fund plans to hold meetings for the selection of new companies every two weeks, which will enableto direct another 17 bln. rubles for the establishment and development of import-substituting industries to the end of 2015.

In March 2015 the Government of the Russian Federation approved the "Action plan to improve the work of development institutions in the field of innovation, taking into account the tasks set out in the Innovative Development Strategy of the Russian Federation for the period up to 2020 and the government programs of the Russian Federation" (http://government.ru/media/files/AvblwTWvibE.pdf) developed by the Minekonomrazvitiya (Ministry of Economic Development) of Russia.

The plan provides a comprehensive range of measures aimed at clarifying the activity directions and functions, improvement of the efficiency of management and coordination mechanisms, as well as optimization of the financial provision of activity of the development institutions, including measures promoting solution of the following objectives:

– further attraction of private investments in the venture market;

– update of strategic documents of the development institutions in the field of innovation in accordance withthe aims and objectives of the Innovative Development Strategy of the Russian Federation for the period up to 2020 and the government programs of the Russian Federation;

– development of the program on encouraging the creation of corporate venture funds, as well as other forms of venture capital investment, by the companies, having approved and implementing the innovative development programs (http://www.rusventure.ru/ru/company/legal_basis);

– involvement in the activities of the institutions of other subjects of innovation activities (including sectoral business associations, technology platforms, regional development institutions, innovative regional clusters and non-governmental organizations);

– improvement of the corporate governance systems of the development institutions, including development of the requirements under the conditions of their interaction with the support recipients, provision of openness and mutual information exchange in the activity of the development institutions, as well as preparation of offers for the unification of approaches to the examination of innovative projects by the development institutions;

     −   provision of participation of the development institutions in the development of scientific and technological forecasting documents, strategic research programs of the technological platforms, as well as usage of these documents in determining the technological priorities in their own activity of the development institutions;

     −   increase of the share of innovative business representatives in the expert bodies at the senior management bodies of the development institutions;

     −   provision of the annual independent assessment of activity of the development institutions;

     −   preparation of offers for the coordination mechanisms of the development institutions in priority areas; organization of joint world-class researches and creation of R&D centers;

     −   development of the practice of "open innovations" in the Russian companies; commercialization of the technologies, development of the objects of innovative non-financial infrastructure; development of the financial infrastructure, including support for the business angels, creation of direct investment funds, guarantee funds, specialized information and trading platforms, as well as involvement of the venture and portfolio investors; stimulation of the demand for innovative products in the companies with the state participation; promotion of the innovation activity of operating Russian companies, including, in the framework of implementation of the programs of innovative development of the companies with the state participation; support of export and integration of the Russian innovative companies in the international value chains;

     −   development of the mechanisms and tools of additional education in terms of training (advanced training) of innovative entrepreneurs and managerial staff; development of the "exit" mechanisms of the development institutions from the funded projects using the public capital market opportunities; involvement of the technological platforms for the examination of projects implemented by the development institutes, etc.;

     −   provision of financial support for the rapidly growing small and medium-sized innovative companies, including the companies with export orientation, which have the potential and prospects for entry into the foreign markets and the high positive dynamics of export expansion;

     −   introduction of compulsory training of public (open) annual reports on the activity of the development institutions in the field of innovation, including information on the implementation of long-term (mid-term) strategies and other program documents, as well as a number of other measures aimed at improving their activity.

     One of the directions of implementation of the "Action plan to improve the work of development institutions in the field of innovation, taking into account the tasks set out in the Innovative Development Strategy of the Russian Federation for the period up to 2020 and the government programs of the Russian Federation" designed in general in 2014 and approved on March 4, 2015, is to develop the "exit" mechanisms of the development institutions from the funded projects in the innovation field.

     In 2014, the successful exits of the development institutions (funds formed with the participation of the development institutions) from the previously invested assets were recorded. Thus, "RVC Seed Investment Fund" (RVCSIF) carried out "exits" from 4 innovative companies. In 2014, the OJSC "RUSNANO" also implemented 9 complete and 9 partial successful "exits" from the innovation projects.

     The key problem of sales of shares in the portfolio companies is the lack of strategic investors in the high-tech economy sector of the number of large Russian corporations. Taking

into account the circumstances of foreign policy, it is possible to overcome this problem only through the involvement of target investors in the innovative projects. The infrastructure objects of the Russian innovation system are presented in Table 1. In this context, in 2014 the development institutions developed and submitted to the Government of the Russian Federation a number of offers aimed, inter alia, at the development of transaction investment lending system to repurchase the portfolio companies by the strategic partners from among the large Russian technology companies.

Table 1
INFRASTRUCTURE OBJECTS OF THE RUSSIAN INNOVATION SYSTEM

Object name	Number
Business incubators	196
Techno parks	159
Technology transfer centers	112
Collective use centers	71
Engineering centers	23
Certification centers and testing laboratories	16
Scientific and technical information center	14
Cluster development centers	11
Subcontracting centers	2

Without the established infrastructure it is impossible to transmit the results of scientific activity from the public to the real economy sector and to implement the integration of medium-sized enterprises with the industry. To date, hundreds of infrastructure objects of the system are created. However, the issues of coordination and cooperation of their activities are on the agenda. It is obvious that the formed Russian innovative infrastructure has significant potential to improve the efficiency. In 2014 the development experience showed that one of the most productive ways to improve the existing infrastructure was its tight integration with the activities of other elements of the ecosystem.

In this sense, one of the most important results in 2014 was the formation of specialized Design Office in the RVC structure, the main task of which is to synchronize the activities of engineering centers, technology platforms and regional clusters, as well as the largest state-owned companies and public corporations. The RVC Design Office cooperates with the Minekonomrazvitiya (Ministry of Economic Development) of Russia, the Minpromtorg (Ministry of Industry and Trade) of Russia, the Minenergo (Ministry of Energy) of Russia, the Minobrnauki (Ministry of Education and Science) of Russia, as well as with other federal executive bodies, enterprises and companies with the support of experts of the Center for Strategic Research and the National Research University Higher School of Economics (NRUHSE).

Creation of the RVC Design Office is determined by the insufficient level of coordination between the subjects of the innovation infrastructure, as well as the problem of the lack of "single window" for feedback in the ecosystem. As it has been shown by the first stage of implementation of the Innovative Development Strategy of the Russian Federation for the period up to 2020, most of the infrastructure tools are created or subsidized by different, often unrelated state and departmental programs. The intersection of these programs does not always implement the required systematic synergistic effect. In order to increase the efficiency of interaction of the

ecosystem subjects, it was necessary to create a single center, able to provide the professional services for the synchronization of disparate activities, accumulating best practices and promoting their scaling.

According to the RVC data in 2014 the total number of objects of innovative infrastructure covered by the Design Office, providing services, support for the activities of objects of the innovation infrastructure and assistance to the development of regional innovative clusters, amounted to 39 units, which significantly exceeded the planned values. The support was also provided to 25 regional innovative clusters, 3 engineering centers and 9 technology platforms.The need to form a globally competitive innovation system is updated due to the transition of the country's economy to the innovation way of development. This task is solved by supporting the access to foreign markets and the transfer of modern technologies in the country. Such support is now provided in the framework of activities carried out by the federal executive authorities (the Minekonomrazvitiya (Ministry of Economic Development) of Russia, the Minpromtorg (Ministry of Industry and Trade) of Russia), and with the support of development institutions (including the programs of Vnesheconombank).

Due to the ongoing efforts, the share of innovative products reached 10% in the export structure of Russia in 2013 (Fig. 1). This figure is still below the level of technologically developed countries, but is already comparable with the figures of the BRICS countries. In the future, we should expect the development in this area by achieving the targets of roadmap "Access support to foreign markets and export support". There is a growing from 8% in 2011 to 10% in 2013 of the share of high-tech products (aircraft industry, electronics industry, pharmaceutical industry, instrument making, mechanical engineering) in the export structure Russia, but the growth rates are significantly lower than in the most developed countries.

Figure 1
THE SHARE OF HIGH-TECH PRODUCTS IN THE EXPORT STRUCTURE, 2013
(HTTP://KREMLIN.RU/ACTS/ASSIGNMENTS/ORDERS/46069)
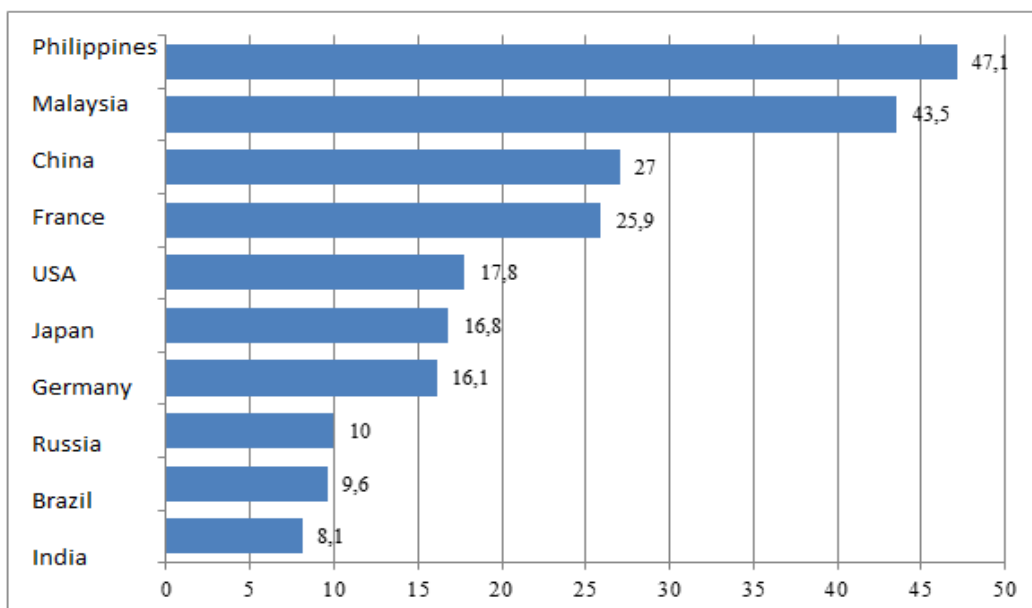
The international experience shows that the world's leading companies spend significant means on the research and development (R&D) both in absolute terms and as a proportion of annual revenue. This enables them to retain the leading positions on the market due to the technology improvement. In the European rating of the R&D expenditures of the companies in 2013, which includes 2.5 thousand companies around the world, Russia is represented by just five organizations. Only three of them entered the TOP-1,000 companies. The oil and gas companies have the highest ratings, while the leader countries of the rating are represented by a full range of relevant industries. At that the structure of the global R&D expenditures shows that a large part of investments (in aggregate more than 50%) is in electronics, medicine (including the pharmaceutical industry) and automotive industry (Fig. 2). Thus, Russia is just expected to redirect the vector of its innovative development from the raw material and defense industries to the industries of civilian goods and dual-use products.

Figure 2
THE STRUCTURE OF THE GLOBAL R&D EXPENDITURES BY INDUSTRY IN 2014
(http://www.worldbank.org/eca/russian/data/research.html)
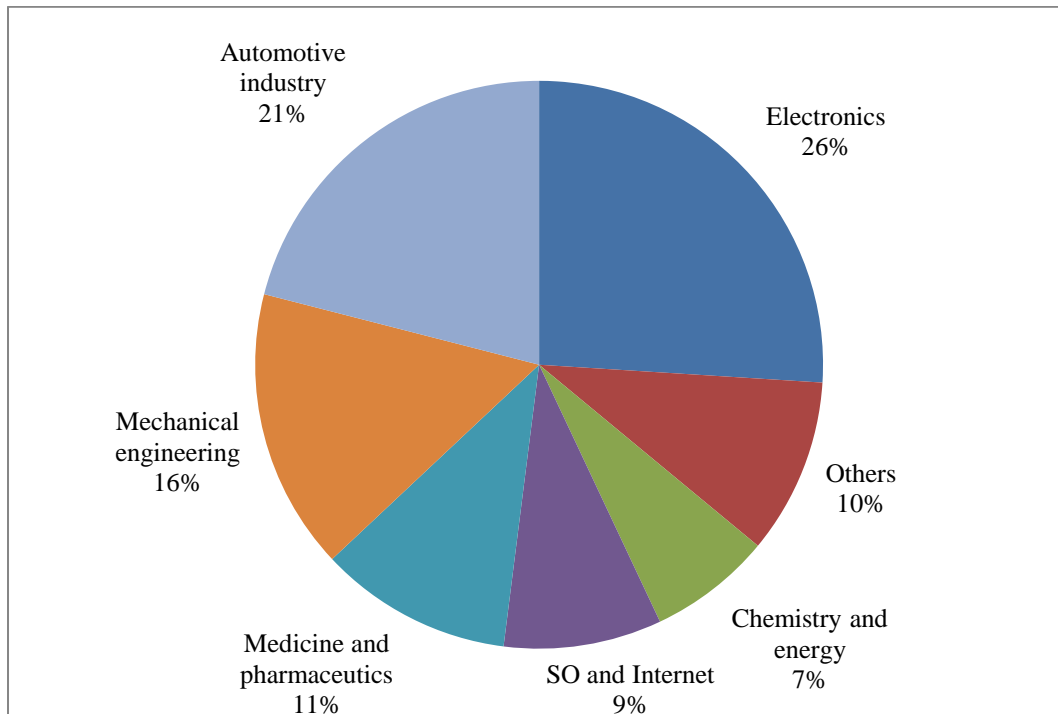
In order to facilitate the long-term development, economy modernization and strengthening the Russian positions as an equal partner on the world markets in 2014, according to the annual program of business missions adopted by the Minekonomrazvitiya (Ministry of Economic Development) of Russia, with the participation of trade representatives, it has been successfully implemented 45 business missions, which aim was to improve the cooperation with the foreign partners. As a result, 31 events in 25 subjects of the Russian Federation were held with the participation of representatives of the Minekonomrazvitiya (Ministry of Economic Development) of Russia, Russian exporting companies, federal and regional executive

authorities, export support regional infrastructure during the implementation of informational campaign with the support of foreign economic activity in 2014.

According to the results of activity in 2014, the scope supported by the Export Insurance Agency of Russia (EXIAR) amounted to $ 3.9 bln. USD. In its activities, the Agency is focused on the promotion for increasing the support volume of Russian export, ensuring the widest possible access to insurance support of the Agency for the various groups of Russian business. The agency provided insurance support to more than 100 Russian exporters; the key export supply regions of Russia, supported by the Agency, became the CIS countries, countries of Latin America, Western and Eastern Europe.

The EXIAR is able to provide the enhanced insurance support to certain strategically important export projects that will strengthen the competitiveness of the Russian financial proposal in the international markets. The list of potential recipients of the EXIAR insurance support has been also extended. Now the EXIAR services are available not only for the Russian exporters, banks and foreign buyers of Russian products, but also for the factoring, leasing companies and international financial institutions.

In addition, on behalf of the President of the Russian Federation in 2014, the EXIAR ownership was passed in the amount of 100% minus 1 share to the JSCROSEXIMBANK (State Specialized Russian Export-Import Bank) for the completion of insurance instrumentation with the ability of export crediting.

The association of credit and insurance competencies on export support will strengthen a comprehensive offer in the financial support area for the Russian exporters. The targeted export support figures for 2015-2018 are presented in Table 2. In 2015, within the framework of the development of this instrumentation, it was made the additional capitalization of the JSCROSEXIMBANK for 10 bln. roubles, and 3 bln. roubles were additionally allocated for the purposes of subsidizing of % rate of the JSCROSEXIMBANK for the hi-tech products.

Table 2
THE TARGETED EXPORT SUPPORT FIGURES FOR 2015-2018
(HTTPS://RG.RU/PRIL/70/45/01/1128_PLAN.PDF)

Indicator	2015	2016	2017	2018
The growth index in the number of exporting companies, % (level of 2011 = 100%)	131%	142%	150%	160%
The export value growth index of industrial products of the high degree of processing, % (level of 2011 = 100%)	120.6%	155.8%	180.1%	205.5%
The volume of loans given by the Vnesheconombank for the export support, bln. USD	1	8.4	13.9	18.2
The number of documents required for the passage of goods across the border, pcs.	7	6	5	4

CONCLUSIONS

In addition to internal and quasi-internal ways of technology transfer (technology exchange within the enterprise, group, alliance, etc.), the foreign transfer, mainly with the participation of foreign companies, has a high potential now. In this context, the coordinating role is taken over by the created technology transfer centers that are engaged in:

- creation of the optimal organizational structure, facilitating the technology transfer;

- involvement of scientists, staff and students to the creation of the fundamentally new intelligent solutions;

- provision of assistance for the protection and commercialization of intellectual property;

- improvement of the quality and volume of research conducted on the orders of production structures;

- facilitation for the implementation of the company's technology by participating on a contractual basis in the creation of new companies based on these technologies through the licensing and commercialization;

- attraction, preservation and development of the competent staff.

At the same time a number of problems still remain unresolved, including:

- lack of demand for innovation on the part of business, especially of the large state-owned companies and monopolies. To date, the problem has no systemic solution and can be operated only in the "manual" mode for each individual situation;

- isolation of innovation processes inside the corporations and holding companies, having a negative impact on the cooperation with the higher education institutions. The solution may be represented by the creation of special services in the higher education institutions, monitoring the needs, assessing the opportunities, planning the researches and implementing the results;

- unwillingness of the foreign partners to transfer technologies used to manufacture the products that are in demand on the Russian market. An example is the "complete knock down" of foreign cars, which is not accompanied by the transfer of significant know-how to the Russian Federation. However, the legislative benefits of production localization are forcing gradually the foreign companies to establish the productions within Russia, and the technology transfer at once.

In 2014, it was started the implementation of 9 said projects and completed the implementation of 4 projects that had been initiated earlier in 2011. One of the joint project implementation models used by the Russian and foreign companies is the conclusion of an offset transaction, providing a territorial division of the rights to the developments commercialization between the partners and cross-royalty from sales on the Russian and foreign markets (Hadiullina et al., 2014).

Focusing of the innovative companies in the regional clusters is made by all technologically advanced countries in the world (Klaas and Vagizova, 2014). The innovations created in them are the most important driver of the internal market development, as well as export potential of the country, and as a result, the GDP growth, integration into the world community, improvement of the technology and the development of social norms. For example, there are created about a hundred major science towns with the aim of mastering the latest

technology in China. Today, they are accounted for 10% of the county's GDP, and this figure should rise to 25% up to 2020 (Fig. 3).

Figure 3
THE NUMBER OF FOREIGN R&D CENTERS WITHIN SEVERAL COUNTRIES, 2013
(HTTP://WWW.PWC.RU/)
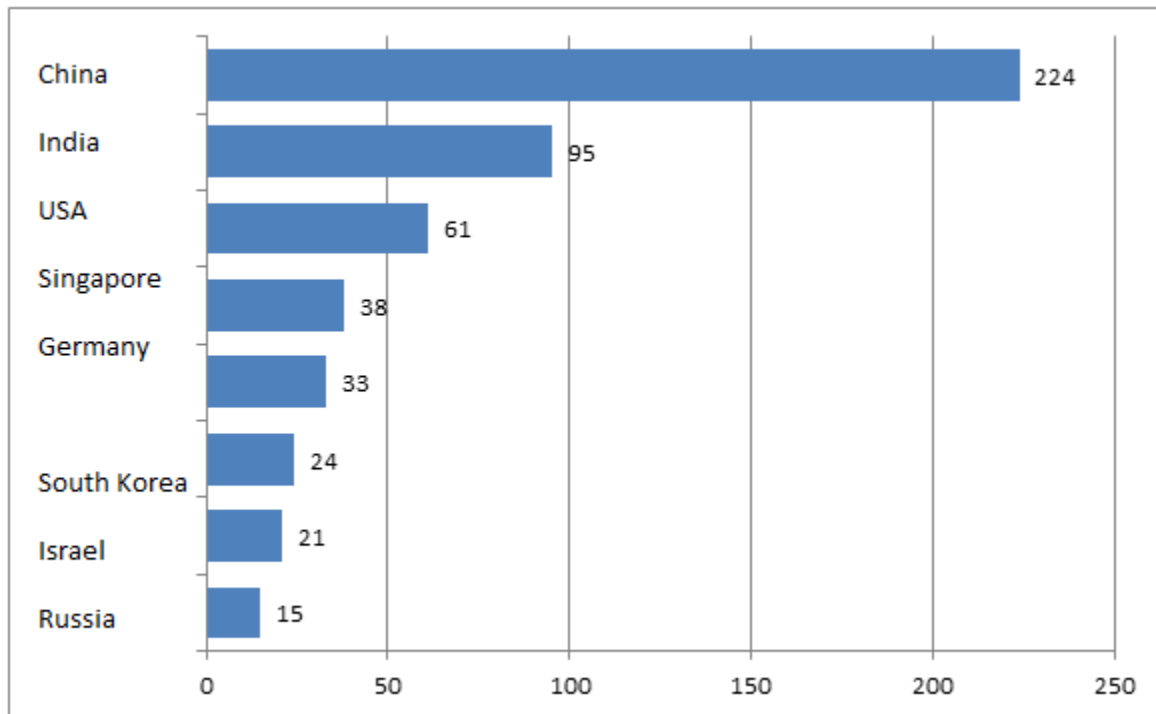
The most important direction in terms of technology transfer is to increase the county attractiveness for opening of the foreign R&D centers in its territory. Russia is greatly inferior to other countries in this direction, taking only the 9th place (Ikhsanova et al., 2014).

At the same time, the measures taken have led to a number of positive results in the test field. Since 2011, the Innovative Center "Skolkovo" is a modern scientific and technological innovation complex for the development and commercialization of new technologies. In fact this is the first science town, which has been built in Russia in the post-Soviet period. In 2014, 1,030 companies were the residents of Skolkovo, 35 agreements were signed with the industrial partners, which included such well-known companies such as Nokia, Siemens, Microsoft, Cisco, Lukoil, Rosatom. 35 key partners Skolkovo include 22 major international companies. The industrial partners are going to open 30 R&D centers and place more than 3 thousand employees in them in the territory of IC "Skolkovo".

It should also be noted the RVC strategic project, aimed at the formation of export support tools of high-tech companies, implemented jointly with the Minekonomrazvitiya (Ministry of Economic Development) of Russia. The strategic project is continued to be implemented in 2015. In general, according to the results of 2014, the number of companies covered by the system formed by the RVC and aimed at support of entrance of the promising Russian innovative companies to the foreign markets and their integration into the global

technological chains, amounted to 54, and the annual export volume of the portfolio companies, carried out with the assistance of the OJSC "RVC", exceeded 27 mln. USD. (Abogest, 2005)

A number of positive developments has occurred in the development of special economic areas, separated now for federal and regionalby the levels, for which there are established the legislative frameworks of activities of the regional special economic areas, which include the production (industrial) parks, technoparks, agro-industrial parks, tourist parks, there is an association of industrial and production, technology and development, tourism and recreation, and port types of areas in the federal special economic areas, it is harmonized the application of the mechanism of deferred payment as one of the measures of state support for the creation of regional special economic areas, as well as the optimization of the use of free customs area mode on the territory of the federal special economic areas. (http: //www.franklin-grant.ru/ru/news2/data/news_06/2005_10/2005100)

Based on the national statistics data, we have investigated the variational series of indicators of the municipal units, which serve as the independent variables x_i in determining the regression equation

$\Delta_i = k_1 + k_2 \ln(x_{i_{prev}}) + \delta$, where

$x_{i_{prev}}$ - index value in the time moment previous to the current one (as a rule, the index initial value);

Δ_i - change of regional indicators, calculated as $\ln(x_i) / \ln(x_{i_{prev}})$;

δ - random deviation;

k_1 и k_2 - coefficients to be assessed.

The results of evaluation of β-convergence of the indicators of entrepreneurship infrastructure development in the VFD regions for 2013-2014 are presented in Table 3.

Table 3
THE EVALUATION OF B-CONVERGENCE OF THE INDICATORS OF ENTREPRENEURSHIP INFRASTRUCTURE DEVELOPMENT OF IN THE VFD REGIONS FOR 2013-2014[1]

Indication	Indicator name	Regression model	R^2
1. Added value	$x_{\backslash 1}$	$\Delta_1 = 1,28 - 0,09\ln(x_1) + 0,02$ $(-2,094)$	0.34
2. Investments in the fixed assets	$x_{\backslash 2}$	$\Delta_2 = 1,85 + 0,18\ln(x_2) + 0,01$ $(1,172)$	0.87
3. Building area	$x_{\backslash 3}$	$\Delta_3 = 1,35 - 0,08\ln(x_3) + 0,05$ $(-3,671)$	0.54
4. Tax and non-tax revenues	$x_{\backslash 4}$	$\Delta_4 = 0,92 - 0,01\ln(x_4) + 0,02$ $(-1,476)$	0.25

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[1] The brackets contain the values of the Student's t-criteria for β.

5. Goods shipped per capita	$x_{\backslash 5}$	$\Delta_5 = 1{,}15 - 0{,}05\ln(x_5) + 0{,}02$ $(-2{,}532)$	0.40
6. Goods shipped	x_6	$\Delta_6 = 1{,}09 - 0{,}02\ln(x_6) + 0{,}02$ $(-1{,}249)$	0.21
7. Gross agricultural production	$x_{\backslash 7}$	$\Delta_7 = 1{,}15 - 0{,}01\ln(x_7) + 0{,}07$ $(-1{,}542)$	0.26
8. Control quality at the municipal level	$x_{\backslash 8}$	$\Delta_8 = -3{,}47 + 2{,}7\ln(x_8) + 0{,}07$ $(-1{,}576)$	0.25
9. Control quality of municipal units activities at the regional level	$x_{\backslash 9}$	$\Delta_9 = 1{,}32 - 0{,}07\ln(x_9) + 0{,}01$ $(-4{,}306)$	0.59

We have conducted a linear modeling of the level of investments in the fixed assets in the municipal units of the region, which has confirmed the need to organize the rational control system of the entrepreneurship infrastructure functioning and development at the regional level, carried out with the use of the SPSS Statistics software. The possibility of using the linear modeling is confirmed by the structure of studentized distribution of investments in the fixed assets in the framework of the used sample, which has included 145 municipal units of the Volga Federal District (Table 4, Fig. 4).

Table 4
THE RESULTS OF EVALUATION OF THE MUNICIPAL B-CONVERGENCE INDICATORS BY REGIONS FOR 2013-2014

VFD region	Presence of β-convergence by indicators	Presence of β-divergence by indicators
Republic of Bashkortostan	x_2, x_3, x_5, x_7	x_4, x_8
Republic of Mari El	-	x_8
Republic of Mordovia	x_2	-
Republic of Tatarstan	x_2, x_3, x_7, x_9	x_4
Udmurt Republic	x_2, x_3	x_8
Chuvash Republic	x_2, x_3, x_7, x_9	x_8
Perm Krai	x_5	-
Kirov Region	x_3, x_8	x_2, x_4
Nizhny Novgorod Region	x_5, x_7	x_1, x_3
Orenburg Region	x_1, x_2, x_3, x_5, x_9	-
Penza Region	x_2, x_3, x_5, x_6, x_9	-

Samara Region	x_2, x_3, x_7, x_8	-
Saratov Region	x_1	-
Ulyanovsk Region	x_1, x_7, x_8	-

Figure 4
THE STRUCTURE OF STUDENTIZED RESIDUES BY THE INDICATOR OF INVESTMENTS IN THE FIXED ASSETS

The histogram of Studentized residuals compares the distribution of the residuals to a normal distribution. The smooth line represents the normal distribution. The closer the frequencies of the residuals are to this line, the closer the distribution of the residuals is to the normal distribution.
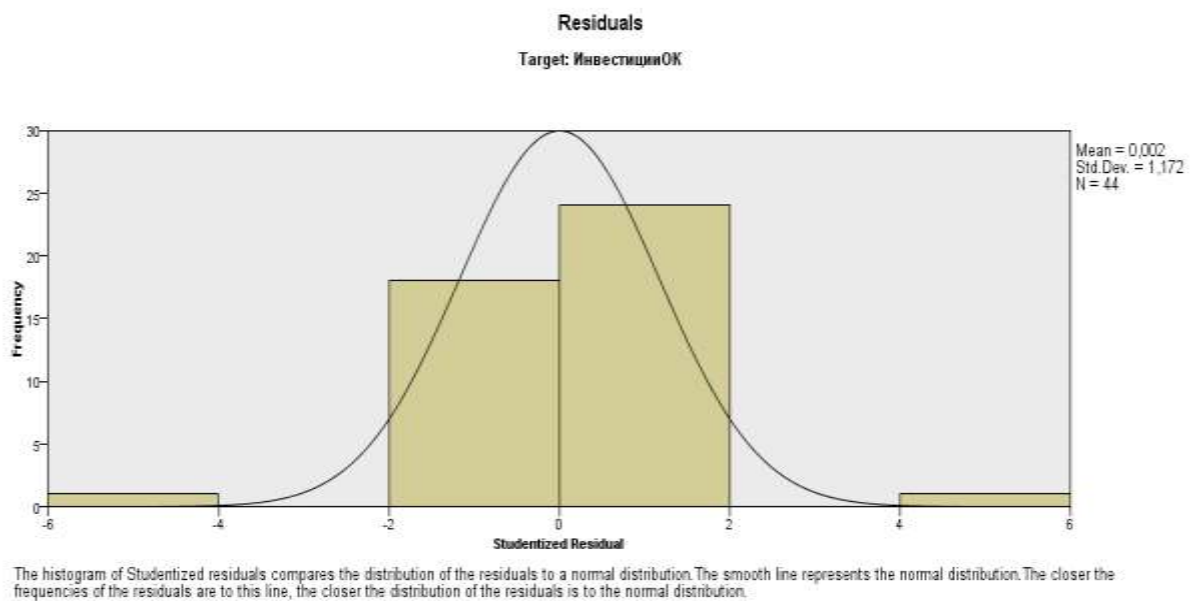
Implementation of the automated linear modeling has revealed two key factors that determine the level of investments in the fixed assets at the municipal level, including the volume of goods shipment, works and services (the most important factor), as well as the control quality of municipal units entrepreneurship infrastructure functioning and development at the regional level (the second most important factor), collectively defining 87.4% dynamics of investments in the fixed assets. Graphically, the resulting model is shown in Fig. 5.

Figure 5
THE GRAPHICAL REPRESENTATION OF THE MODEL OF INVESTMENT IN THE FIXED ASSETS BY THE MUNICIPAL UNITS WITH AN INDICATION OF THE NATURE OF RELATIONS
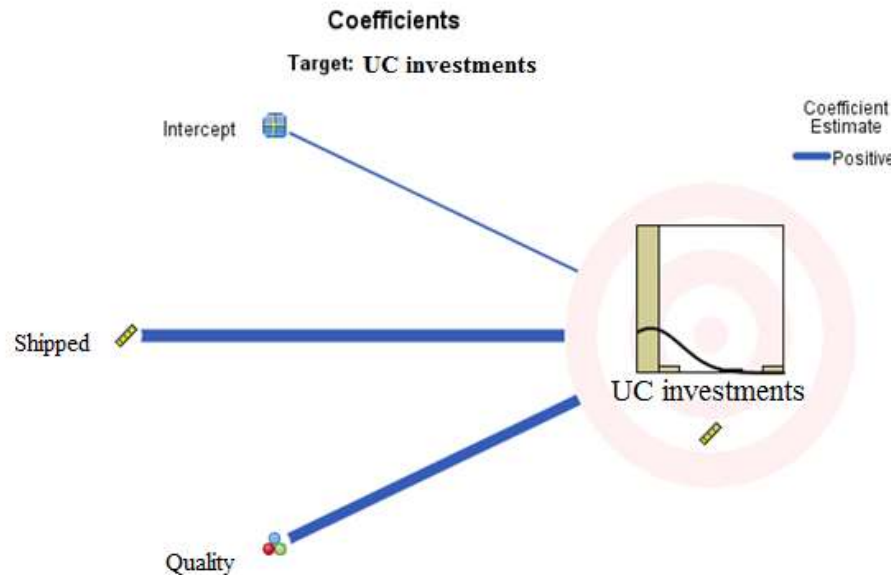
SUMMARY

As it is seen from the figure, all relations, presented in a linear model, are positive, confirming the need for the implementation of effective controlby the state government over the entrepreneurship infrastructure development directions and condition at the regional level in ensuring growth platform of investments in the fixed assets.

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ON THE ROLE OF SMALL BUSINESS IN THE DEVELOPMENT OF ECONOMIC SYSTEMS

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ABSTRACT

Article aims to study the trends which emerge in the field of small business in the Russian economy and their impact on the economical growth, proposals generation to stabilize the sphere. The methods used to study: the historical and economic analysis; abstract and logical approach; comparative analysis; statistical analysis of the data. The study was conducted by the example of the Russian economy compared with the economies of other developed market countries. The dynamics of the small business sector development was considered; steady trend towards a slowdown in its growth was identified. Using the example of European countries with developed market economy, a relationship between the branch structure of small business and the state of technological basis of society has been established. Conclusions: The impact of small enterprises on the development of economical systems in different concrete-historical stages is realized through various mechanisms; small business development is an objective response to changes in the technological base and the organizational and economic environment of a society, and an artificial increase in the rate of growth is not advisable; small production is effective only when there are all the appropriate technological, organizational, economic and institutional conditions, and others.

Keywords: small enterprises; small business; economic growth; economic imbalances; production efficiency; entrepreneurship functions; technological basis; technological modes; integration of large and small businesses; innovative development.

INTRODUCTION

Small business plays an important role in modern market economy. It directly affects the amount of gross domestic product (GDP) and its growth rate. For example, experts of the US Small Business Administration directly point to that (Major et al., 1953). In the developed European countries, the small business accounts for about 50% of the GDP generated, in the US - more than 50%, and in Japan - 70%, while in Russia - only about 15%. Small enterprises and independent inventors give up to 90% of all discoveries, innovations and technological developments (Krasulin, 2009), thereby promoting enhancement and restructuring of the economic structure.

However, small business importance is not limited to contribution into the quantitative characteristics listed above. Being directly related to the state and tendencies in development of institution of property and monetary institution, and with the trends in changing a society technological basis, it has a direct impact on the innovative development of the economy (Innovation and research strategy for growth, 2011), on formation of the key system and structure-forming relations in the economic system, creating conditions for transition to a new

quality of economic growth and new more efficient type of economic imbalance mitigating and eliminating its negative consequences. According to J. Schumpeter, an entrepreneur is always in motion, it is not tied to any one company or property, it is mobile and changeable, his/her will and efforts are aimed at changing the environment (Schumpeter, 1974). In addition, small enterprises, unlike large, are, in fact, precisely the environment and the ground based on which the market economy as such grows and is reproduced. It is here above all the "spirit of enterprise" is manifested giving birth to an entrepreneurial man about whom M. Weber (Weber, 2005) and V. Zombrat (Zombart, 1913) said at the time.

An interest in the problems of a role and importance of small business in economic efficiency and development of economic systems has been significantly increased in recent decades due to transition to the market economy of a number of Eastern European countries, including Russia. Although in the latter, in fact, it did not exist as an independent economic institute for a long time, and the first steps in its revival was taken only during the period of reforms by M.S. Gorbachev after the adoption of the Law on self-employment (dd. November 19, 1986) which allowed this kind of activity in the fields of handicrafts, consumer services and some other based on personal labor of citizens and their families, and the Law on Cooperatives in the USSR (dd. May 26, 1988) which for the first time since the New economic policy held in the 1920s, permitted the establishment of private enterprises in the country, and the provisions of the Commission at the Council of Ministers of the USSR (dd. July 6, 1988) which have introduced a simplified procedure for the establishment and registration of small enterprises.

Study of the problem set in the article is important and relevant both from a theoretical, and not least from a practical point of view as it is directly related to the formation of new, more effective economic relations and market self-regulating systems.

METHODS

We have used the following research methods:

− historical and economic analysis method, including historical and economic aspects of cognition of the process of small business institution creation and development, and changes to its role in the development of economic systems. Methodologically, it is based on the works of M. Weber, V. Zombrat, A. Toynbee (Toynbee, 1934), M.M. Kovalevsky (Soshneva, 2006), and others;

− abstract and logical method comprising, firstly, a scientific abstraction using methods of analysis, synthesis and analogy, and secondly, the theoretical conclusions which reflect the development of small business and the use of these results for practical purposes;

− method of statistical data analysis;

− comparative analysis method to separate common and distinctive features of the processes of small business formation and development in different economic systems.

RESULTS

In the Russian Federation, evolvement of small business sector that began in 1980-1990-ies, is characterized by complicated dynamics. For example, in 1997 there were 1 million small enterprises employing 8 million people. Subsequently, until 1999, the number of small enterprises increased slowly. In 2000 and 2001, it declined but then a very stable upward trend

started to form again, and the absolute number of them in the country now makes more than 2 million (see Table 1 below).

Table 1
BASIC ECONOMIC ACTIVITY INDICATORS OF SMALL ENTERPRISES BY YEARS

Years	2000	2001	2005	2010	2011	2012	2013	2014
The number of companies at the end of the year, thous.	890.6	879.3	979.3	1644.3	1836.4	2003.0	2063.1	2103.8
Average number of employees, thous. people.	6596.8	6542.8	8050.0	9790.2	10421.9	10755.7	10775.2	10789,5
The turnover of enterprises bln. rub.	613.7	852.7	9612.6	18993.8	22610.2	23463.7	24781.6	26392.1

Note: compiled by the authors based on (Small and medium-sized businesses in Russia in 2015; 2015)

It can be seen from the table that the upward trend is also observed in the number of employed in small enterprises, and in the size of their turnover. Thus, with some degree of conditionality, the dynamics of the number of small enterprises across the country can be divided into 3 periods: from the beginning of the 1990s to 1998-2000 - a period of slow, sometimes slight increase; 2000 - 2003 years - the period of growth decline or slowdown; 2005-2015 - a period of sustained growth with a decelerating rate.

In addition to the indicator of the absolute number of small enterprises, an important role in assessing the dynamics is played by the change in their number per 10 thousand people. The analysis showed that from 2010 to 2015 through Russia as a whole, and in all its federal districts that number increased, albeit at different rates. However, despite the positive dynamics of the indicator, Russia still has one of the lowest places by its value in comparison with the developed market economy countries (Nikolaev, 2014).

The change in the average number of persons employed in small enterprises mainly corresponds to the dynamics of their quantitative composition. So, in 2005, growth of this indicator in relation to the year 2000 through the Russian Federation was 9.9%. The maximum has fallen to the middle of the analyzed period: increase in 2011 relative to 2010 - 16.8%. However, in 2012 relative to 2011 the growth declined to 9%, in 2013 with respect to 2012 - to 3%, and in 2014 with respect to 2013 - to 1.9%, i.e. there was a strong tendency to slow down.

Let's consider the dynamics of distribution of small enterprises by economic activity that plays an important role in the nature of their influence on economic growth. The analysis showed that the vast majority of small enterprises (two thirds or more) is wholesalers, retail traders, and companies operating in the various types of services. Their share is virtually unchanged: 66% in 2007; 65.2% in 2008; 65% in 2009; 66% in 2012, and 66% in 2014.

The share of commercial enterprises in the structure of small business is only about 40% (Fig. 1).

Figure 2
THE NUMBER OF SMALL ENTERPRISES IN RUSSIA BY TYPES OF ECONOMIC ACTIVITY AT THE
END OF 2014, IN % (RCSME.RU/RU/STATISTIEC)
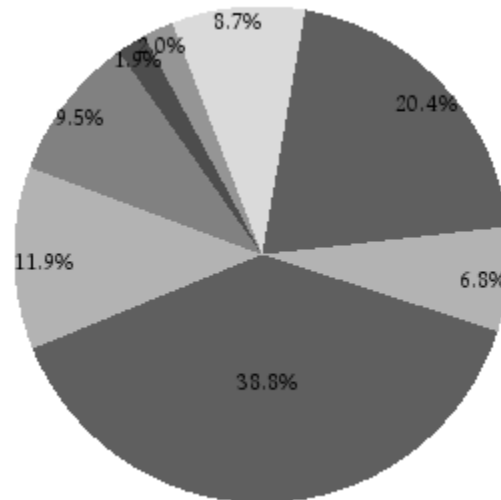
In this regard, we call attention to the fact that in countries with developed market economy, the predominance in the field of small business enterprises, primarily in retail trade and services, took place in the first half of the XX century until about the 1970s when the role of the state and public property in the economy and the business rapidly strengthened, business and government capitals and structures have been merged, and small enterprises which cannot compete with them have been essentially supplanted to the economic periphery.

Those few small enterprises which continued to operate in the manufacturing and building industries, turned out to be in the full financial and commercial dependence on large firms, almost losing their market independence.

These effects were associated primarily with the features of the technological basis of the fourth technological mode, a kind of symbol of which became mass production through the use of conveyor technology and integrated automation of the main production processes. Under these conditions, the functions of large and small businesses polarized in fact. If the first provided the performance of the main task: production of the bulk of consumer goods, economic growth and innovative development of the economy, the second better fulfilled social functions (Asian Social Science): increasing the degree of employment, expansion of sources of additional revenue, etc.

However, in the 1980s during formation of preconditions for transition to the fifth technological mode based on microelectronic components, there has been one more radical change in the position and functions of small enterprises that essentially determined its new role in the innovative development of the economy.

The main reason for this was that the wide spreading of microelectronics equalized manufacturing capabilities of large and small businesses allowing any enterprise, regardless of the range of its activities, equally well to use any of the latest information technologies. And in conjunction with such advantages of small-scale production as flexibility, mobility and

adaptability, all this gave it a number of important cases significant competitive advantages, allowing successfully to operate now not only in the retail trade and services, but also in the most technologically advanced sectors of the economy.

At the same time, in the developed countries, in the conditions of formation of a new institutional and organizational environment the development went not on the way to the opposition of large and small businesses, and to their integration. This led to the birth of new, not encountered previously forms of organization and interaction between large and small businesses such as technology parks, business incubators, shell companies, and others, provided a substantially real breakthrough in the innovative development of the economy (Postalyuk et al., 2013) where small business began to appear in a new role as a kind of conductor of technological and organizational changes.

If to look at the development of the Russian small business taking into account what has been said, it should be noted the presence of serious problems here. The main of them is the condition of technological basis of national economy corresponding, in general, only to the fourth technological mode and the lack of visible positive dynamics of its change. The share of information technology sector in Russia's GDP in 2000 was amounted to 1.16%, while in the US - 25%, in the EU - 15%. Currently, it is equal to about 4.8%.

It follows from what has just been said above that a small business in Russia implements primarily the essentially support functions which it carried out in Western countries in the middle of the last century corresponding in its content more to the small enterprises of the industrial age, focusing in the same way on the retail trade and services mainly. And so, the further increase in the number of small enterprises planned, as a rule, by all regional support programs, if it is not accompanied by any real changes in development of the technological basis, would not be only futile, but hardly feasible at all, since it will not change for the better nor the structure, nor production efficiency or the quality of economic growth.

Note also that the impact of small enterprises on the economic growth, the competitiveness of the system and on economic development as a whole comes about in more complex way than it often appears in the literature, and not all links have been identified here. At least in the US, where the number of small and medium-sized enterprises is currently the largest (more than 30 millions), some experts in the early 1990s still argued that this is the reason for the decline in living standards of Americans and insufficiently pronounced economic growth and felt justified any measures for the return of small enterprises to large businesses. (Brown et al., 1990)

From the above it can be concluded that intensive growth of small business cannot be an end in itself, but is an objective consequence of the changes in the technological base of production, organizational and economic environment, and further development of small business in Russia will depend not so much on the increase in the number of enterprises, but also on creation of economic and institutional conditions for their cooperation with large business based on the principle of complementarity and distribution of functions, conversion of a small business from the sector which performs intermediary functions into the conductor of technological change that can give new impetus to the innovative development of economy.

CONCLUSION

The following conclusions can be drawn from the study conducted.

1. The impact of small enterprises on the effectiveness of management and economic growth is not the same at different stages of history, and is carried out through various

mechanisms. From the middle of the XVIII century. the first third of the XIX century. in European countries, it was largely due to the increase in the number of small companies, because these companies were the predominant organizational form of production. From the second third of the XIX to the last third of XX century. in the conditions of centralization and concentration of capital and the transition to mass production, when the number of small enterprises was reduced and played a supporting role, the called impact was realized through social mechanisms.

Finally, at the end of XX - beginning of XXI centuries, this effect is due to the new content of small business which acts in the conditions of formation of postindustrial economy as a conductor of technological and organizational changes.

2. Development of small business is not an end in itself, and a forced objective response to changes in the technological base and the organizational and economic environment of a society. However, due to simultaneous co-existence and co-evolution of different technological structures each of which has its own business structures and forms, the number of small and medium-sized enterprises is limited, and they should not replace and displace other forms of business organizations, and can exist and function effectively only in interrelationship with them.

3. Small business is not always efficient and competitive, but only in those cases and in those sectors of activity where there are all the relevant technological, organizational, economic and institutional conditions. Only availability of such compliance can explain the important role of small business in the formation of positive trends of economic growth in developed Western countries.

4. Although the existing today rates of growth in the number of small enterprises in the Russian economy and their role in improving economic efficiency and economic growth are not sufficient in terms of the laws of development of a market system, but are in line as a whole with the conditions of the current economic environment and the state of technological basis and their further artificial increase is not advisable.

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THE ROLE OF FINANCIAL ANALYSIS IN THE STRATEGIC MANAGEMENT OF INDUSTRIAL ENTERPRISE

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ABSTRACT

The company strategy management is represented by solving of several problems: setting objectives and development of strategic plans, realization of plans and control over this process, introduction of necessary corrective actions into the plans and ways for their implementation. We have considered the most important problems, arising in the course of strategy management, specified the basic methods for strategy development and control, proposed the evaluation of possibility of BSC system application during analysis; grounded the role of financial analysis instruments in the course of strategy control and evaluation.Using the example of large manufacturing outfit the PJSC "Nizhnekamskneftekhim" (the town of Nizhnekamsk, Republic of Tatarstan, Russian Federation), we demonstrated the possibilities of financial analysis in the system of control over strategy implementation. There were applied the methods of structural- dynamic- and horizontal analysis, as well as the comparison method. According to the results of assessment of economic potential, capital structure and financial stability, production process efficiency, financial results and financial resources, we identified the potential threats, requiring strategy adjustment. They include: decrease of material- and financial resources' efficiency (in particular, the increase of asset turnover period for 22 days), excessive reinvestment of net profit and absence of financial leverage effect (the growth of equity-assets ratio from 78 to 85%), dependence of financial results on foreign trade conditions (profit increment of 13% due to, among other things, ruble fall in 2014-2015). In conclusion we grounded the financial analysis restrictions in the strategy evaluation system.

Keywords: balanced score card, turnover, net income, balance sheet.

INTRODUCTION

The problem of interaction of financial- and strategic analysis' systems in the industrial enterprise management was considered.

The research objective is to ground the methodology of analysis results' application for evaluation and adjustment of development strategy. On the basis of financial statements and annual report of large manufacturing outfit, the quick analysis of key financial indicators with the use of structural-dynamic- and ratio methods was conducted, on the basis of which the evaluation of current strategy was made, and weaknesses and threats, requiring strategy adjustment were defined.

The topicality of development and implementation of both general business strategy and separate strategic plans of the enterprise under the developed market conditions does not admit of doubt. The development of such plans, decision-making with regard to current strategy,

evaluation of financial and economic activity performance under the key figures of strategic plans are among the management priorities (Bowman and Asch, 1987). Since the conditions of external and internal environment are subject to dynamics, the strategic plans are as a rule, regularly adjusted. Monitoring of environment changes, as well as plans adjustment are also among indispensable work aspects of mid-level- and top managers.

Note should be made of the certain change in approaches to the scope of strategic management. Whereas initially (in the middle of the XX century) the strategic management was understood as objectives setting, determination of general guidelines, evaluation of objectives achievement degree and plans adjustment where necessary, at the present time the emphasis is laid on forming the effective management system and allocation of managerial and financial resources (White and Sondhi, 1994).

The strategy development implies the use of favorable opportunities and removal of threats from the side of external environment, as well as the use of inner potential and correction of weaknesses in the internal environment. Despite numerous techniques, in large part successfully used in practice, and the considerable experience both abroad and in the RF, the most topical and having no clear-cut solution strategic management' tasks are as follows:

1. which processes, occurring in the external environment affect the company's activity, what is this processes' "critical change", requiring strategic plans' adjustment;

2. how to effectively reconcile the internal environment characteristics with external environment processes;

3. how to get the priorities when making day-to-day decisions;

4. which and what amount of resources are necessary in order to achieve the strategic objectives;

5. how to organize the effective monitoring of strategy implementation, etc.

In the strategic management system one should differentiate between the strategy development tools (SWOT-analysis, Ansoff matrix, PIMS project etc.) and tools for strategy implementation' realization (benchmarking, life cycle analysis, balanced score card of D. Norton and R. Kaplan etc) (Trifonov, 2014).

Among the strategy evaluation methods one of the most popular, which in our opinion is characterized by simplicity and relevance, is the balanced score card (BSC). It is the management system, transforming the organization's mission and strategy into the set of operating objectives and indicators, which direct the collective's activity to common problem solving (Kaplan and Norton, 1996). The main objective of the system is strengthening the company's strategy, its formalization, feedback promotion, identification and promotion of initiative within business units.

The BSC presupposes the multifaceted scheme of strategy efficiency evaluation, including: 1) finance; 2) marketing; 3) innovations and business-processes; 4) personnel qualification etc. In such case, as a rule, the financial objectives are at the top of company's objectives tree, as the financial indicators are the aggregate result of financial and economic activities. Marketing and other indicators are to a greater degree used to forecast the future financial status.

METHODS

Descriptive, comparative, structural-dynamic- and ratio methods. We calculated the key financial indicators of industrial plant per 2014-2015. On the basis of calculation and dynamics comparison we gave the evaluation of the current development strategy, and proposed the ways

for its adjustment.

RESULTS

Financial indicators are the fundamental criteria for evaluating the current activity of any organization. As a rule, the following items act as typical objectives in the frame of finance: provision of self-financing and of the acceptable liquidity level, availability of sustainable sources for expanded growth' funding, maintenance of the optimal cost structure, provision of sales- and profit growth. The timely and relevant financial information enables to flexibly respond to changes in the financial system and take the necessary corrective measures (Hofer and Schendel, 1978). Though one should not concentrate on the financial indicators only, as this leads to "unbalanced" situation in respect of other processes. Thus the growth of revenue and profit can create a false impression that everything is all right, and reduce the interest of management team to perform analysis of other processes. So it is necessary to take into account the additional financial and non-financial data as well.

In this connection, the considerable attention in strategy evaluation system shall be paid to financial analysis. Competent, timely and consistent application of certain analysis methods makes it possible to provide the users with a considerable amount of information for thought and decision grounding (Yelakova and Karnach, 2015; Sorokina, 2011). Some methods shall be applied regularly (on monthly or quarterly basis), other – once a year, still other – upon specific situations' occurrence. The choice of methods and indicators is determined by different factors, such as the enterprise size, industry classification, market conditions etc. (Zabrodin, 2011; http://www.globalreporting.org/resourcelibrary.pdf).

The obligatory condition for adequate financial analysis is taking into account the sector peculiarities and the size of enterprise, being the target of analysis. The industry as a sector can be characterized by the following specific features:

1.   the relatively long investment- and manufacturing cycles, leading to the necessity of raising the long-term lending, the considerable size in balance is occupied by the "Inventory" item;

2.   big investments into the non-current assets, primarily into the fixed assets;

3.   a considerable equity share is needed for financial stability provision (50% of liabilities and more);

4.   a vast amount of normal and overdue receivables appears, as shipment is made in large lots on a deferred-payment basis;

5.   material costs hold the major share in the cost structure.

Let's consider the possibility of financial analysis tools' application in order to evaluate the development strategy of PJSC "Nizhnekamskneftekhim" (the town of Nizhnekamsk, Republic of Tatarstan, Russian Federation). The data was taken from the company's annual account for 2015 (https://www.nknh.ru/upload/iblock/61c/year_report_2015.pdf).

PJSC "Nizhnekamskneftekhim" produces over 120 different products in 4 major categories: synthetic rubbers, plastics, monomers and other products. The industrial complex includes 9 industrial plants with a total area of 22 square meters, staff number – over 16000 persons. The company declares sustainable development as its strategy. The main strategic targets:

1.   strengthening positions in the global markets and CIS markets;

2.   avoiding the sales of products with low added value.

Main ways for strategy implementation:

1.   expansion of production volume and range of core products;
2.   increase of revenues and profits;
3.   enhancing the level of raw hydrocarbons' processing;
4.   fixed assets upgrading;
5.   provision of safety and energy efficiency of production process.

Note should be made of somewhat inaccurate wording of the second way of implementation, as the increase of revenues and profits is rather the consequence of made decisions, than the tool for objectives achievement. Though in our opinion, this is not the matter of principle in this research work.

Taking into account the abovementioned special aspects of large manufacturing outfit, and the current strategy, it is necessary to give prominence to financial indicators, which shall be applied during evaluation:

1. economic potential (structure and dynamic of assets);
2. capital structure and financial stability;
3. production process efficiency (capital turnover);
4. financial results (revenues, expenses, profitability);
5. use of financial resources (cash flow pattern).

Calculation of key financial parameters under the first and the second blocks is given in the table 1; under the third and the fourth – in the table 2.

Table 1
EVALUATION OF ECONOMIC POTENTIAL, CAPITAL STRUCTURE AND FINANCIAL STABILITY

	Parameter	As of the end of 2014	As of the end of 2015	Change Value
1	Total assets, billion rubles	87,2	107,1	19,9
2	Share of non-current assets, %	65,3	59,6	-5,7
3	Share of fixed assets in non-current assets, %	87,0	88,7	1,7
4	Share of reserves in balance, %	14,7	14,3	-0,4
5	Equity-assets ratio, %	77,8	85,4	7,6
6	Share of firm liabilities in balance, %	81,9	87,6	5,7
7	Share of undistributed profits in balance, %	68,2	77,8	9,6
8	Share of working capital in balance, %	16,6	28,0	11,4

The company was actively increasing the property potential in 2015, as indicated by gross assets growth by almost 23%, and the fixed assets increase, though their share has somewhat reduced. The inventory value increased proportionally with gross assets, which positively characterized the inventory management system. What comes under notice is the absolute financial stability, as indicated by parameters under the figures 5-8 in the table 1. The company practically doesn't use the financial markets' opportunities, focusing on the own sources of financial resources, mainly on undistributed profits, the share of which in balance approaches to 80%. As a matter of fact, such a high share of equity capital is not characteristic of industry (by comparison, the top truck manufacturer in the RF – PJSC "KAMAZ" in 2016 has a share of equity capital amounting 33%). This implies, on the one hand, practically complete

independence of external capital sources and low risk degree of investment into company securities; on the other hand – lack of capacity and will of management and owner to invest funds into business diversification. The company is focused on this kind of business and does not seek opportunity to go beyond the limits of its market. The negative consequence is entering into strong dependence on demand, global market competition and product pricing level.

Table 2
EVALUATION OF TURNOVER AND FINANCIAL RESULTS

	Parameter	Per 2014	Per 2015	Change Value
1	Asset turnover, days	239	260	21
2	Fixed asset turnover, days	136	137	1
3	Inventory turnover, days	35	37	2
4	Receivables turnover, days	26	32	6
5	Equity capital turnover, days	186	222	36
6	Sales revenue, billion rubles	132,9	150,6	17,7
7	Net income, billion rubles	9,3	26,5	17,2
8	Net profits margin, %	7,0	17,6	10,6
9	Net return on assets, %	10,7	24,7	14,1

During the studies of turnover and results, conspicuous is the fact of turnover period increase upon the key figures. The main reason for this is the accelerated asset growth (+19,9 billion rubles or 23%) over the revenue growth (+17,7 billion rubles or 13%). This gives evidence of resource efficiency decrease, which can imply the growth of opportunities for sales revenue increase in future; as well as of growth opportunities' overestimation in 2015 – the management expected to ramp up production in a greater degree compared with the actual obtained results.

One more thing that should be noted is the sharp increase of net income – almost by 3 times, resulting in considerable profitability increase, which may be treated positively. Though it should be taken into account, that such parameters were achieved in 2015 – a year of sharp drop in the domestic currency value. Taking into consideration the fact that 48% of company products were sold in the foreign markets, one can with a high degree of certainty suppose that the good dynamics of sales proceeds and net income was achieved not due to effective expenses-and-income-management system, but through favorable environment in the foreign exchange market.

In order to evaluate the efficiency of financial resources' use, one should compare the net cash flow by types of activity (table 3).

Table 3
EVALUATION OF FINANCIAL RESOURCES' USE

	Parameter	Per 2014	Per 2015	Change Value
1	Net cash flow from current operations	14,7	26,2	11,5
2	Net cash flow from investment transactions	-8,1	-14,5	-6,4
3	Net cash flow from financial operations	-3,1	-7,3	-4,2
4	Net cash flow	3,5	4,5	1,0

The situation for the two periods under review is the same. There is a considerable net cash flow from current operations, in other words, the company generates a substantial amount of financial resources from production and sales, used not effectively (in particular, resources are not directed to development of new market segments). Refusal of borrowed funds (as evidenced by negative result of financial activity) raises liquidity, on the one hand, but shows the lost profit under conditions of financial leverage degree reduction, on the other hand. As a consequence, due to maintenance of too high liquidity level, the received financial resources are underused, which leads to loss of potential growth opportunities.

CONCLUSION

Thus, the intermediate results of implementing the long-term development strategy of PJSC "Nizhnekamskneftekhim" can be generally recognized as positive. This is evidenced by property growth, including the fixed assets, growth of revenues and profits, maintaining and strengthening of financial independence. The most topical issues, requiring the adjustment of strategy implementation ways are the decline in efficiency of material- and financial resources' use, excessive net income reinvestment and lack of financial leverage degree, dependence of financial results on foreign trade conditions.It would be certainly wrong to make final conclusions and take measures on amending the strategic and current plans only on the basis of conclusions on the conducted financial quick analysis' results. It is necessary to associate financial indicators with processes in external and internal environment, which falls beyond the scope of this research work. The financial analysis results make it possible only to promptly, fairly and with a high degree of certainty detect the potentially dangerous or undesirable situations, and develop the complex of measures on their prevention.

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APPROACHES TO EVALUATING THE EFFICIENCY OF PUBLIC PROCUREMENT CONTRACTING SYSTEM IN THE RUSSIAN FEDERATION

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ABSTRACT

The results of study of approaches to assessing the economic efficiency of public procurement of goods, works and services for state and municipal needs in the Russian Federation were based on the objective interpretation of the theoretical content of the alternative criteria which reflect the different aspects of development of contractual procurement system. Retrospective analysis of the comparative saving value achieved as a result of implementation of public procurement throughout the study period being one of key indicators of their financial productivity, illustrates the difficulty of establishment the determining causal link between ongoing dynamics and indicators of state procurement organization. We have justified the author's judgment on the fact that in the modern economical situation, reduction of the initial (maximum) contract price is limited to volatile market conditions, therefore, it cannot act as an unconditional criterion for evaluating the effectiveness of the public procurement contract system instruments and must be supplemented by indicators of development of a competitive environment which should include the average number of applications submitted by the participants for the right to conclude a state contract, the volume and structure of procurement with a sole supplier. Detailed representation of the questions on efficiency of public procurements requires substantive consideration of typical violations attributable to the areas of increased risk during monitoring the condition of the system analyzed. In the concluding part of the work, the assertion was made about the need to develop specific indicators for information relevance of the Unified Information System data, as well as indicators of public influence on the conduct of individual purchases, organizational and methodological mechanisms of procedural elements of functioning the system as a whole.

Keywords: Public procurements, supervision of public procurements, the contract system of public procurements, public procurement performance indicators.

INTRODUCTION

In modern conditions, the discussion about formation of the approaches to the development of efficient algorithms for organization of procurement of goods, works and services for state needs, usually seen in the context of implementation of priority directions for the Russian Federation economic development. The decline in economic growth rates, the impact of unfavorable market conditions determine the need to search for and mobilize reserves for increasing efficiency of budgetary expenditures most of which are currently implemented using the instruments of contractual public procurement system (http://base.consultant.ru). Multidimensional nature of procedural elements of the system aimed at achieving a compliance of incurred costs to their objectives determines the complexity of the integrated monitoring of the

contract system operation and a polemical character of approaches to assess its economic efficiency.

METHODS

The study on evaluating the effectiveness of public procurement is based on a synthesis of the provisions of fundamental scientific sources where elements of the obtained theoretical basis in the field of main approaches to the regulatory impact on the algorithms of procurement procedures and definition of their performance have been systematized (Flynn and Davis, 2014; Trepte, 2012). However, the revision and addition of theoretical postulates by author's developments dedicated to directions for the development of organizational and methodological aspects of procurement procedures, the search for effective forms of public-private partnership in the implementation of public needs, allow us to consider public procurement as a domain of dynamic scientific investigations (Bergman and Lundberg, 2013; Hoppe et al., 2013). Noteworthy are procurement policy-making questions in the context of their impact on the dynamics of economic processes. (Murray, 2009) A significant role in the consideration of the topic of this study is played by generalization of the experience on organization of procurement procedures in the conditions of the individual specifics of national economies (Arai et al., 2013; Amann, et al., 2014; Jurcík, 2014). Approaches to evaluating the effectiveness of procurement procedures are discussed in the context of their corruption component revealed in various countries (Auriol, 2006; Tanaka and Hayashi, 2016). Thus, a comprehensive analytical review of the aspects of the topic under consideration becomes the basis for formation and substantiation of authors' conclusions and proposals.

RESULTS

Study of the issues on effectiveness of the contractual system of public procurement allows us to conclude that, as a rule, the rate of budget savings determined by summing the total decline of values of contracts as a result of the application of supplier selection rules established on the legislative level should be considered as the key criterion for economic assessment of the results achieved in the analyzed period. In order to improve the analytical evaluation quality in the process monitoring of in relation to a separate procurement method the indicator of comparative saving involving the use of the following functional algorithm should be used:

$$E = \frac{\sum_{i=1}^{n}(S_i - F_i)}{\sum_{i=1}^{n} S_i} \cdot 100 \quad (1)$$

where, E - value of the comparative savings, %; S_i - the initial (maximum) contract price established in the documentation for execution of procurement, RUB; F_i - the contract price offered by the winner of the procurement, RUB; n - number of state contracts concluded, offs.

Figure 1
COMPARATIVE SAVINGS ACHIEVED AS A RESULT OF PROCUREMENT IN THE 1ST HALF OF 2015-2016 GROUPED WITH A BREAKDOWN TO THE METHODS TO SELECT A SUPPLIER, %
(HTTP: //ECONOMY.GOV.RU/MINEC/ABOUT/STRUCTURE / DEPFKS / 44/20160729)
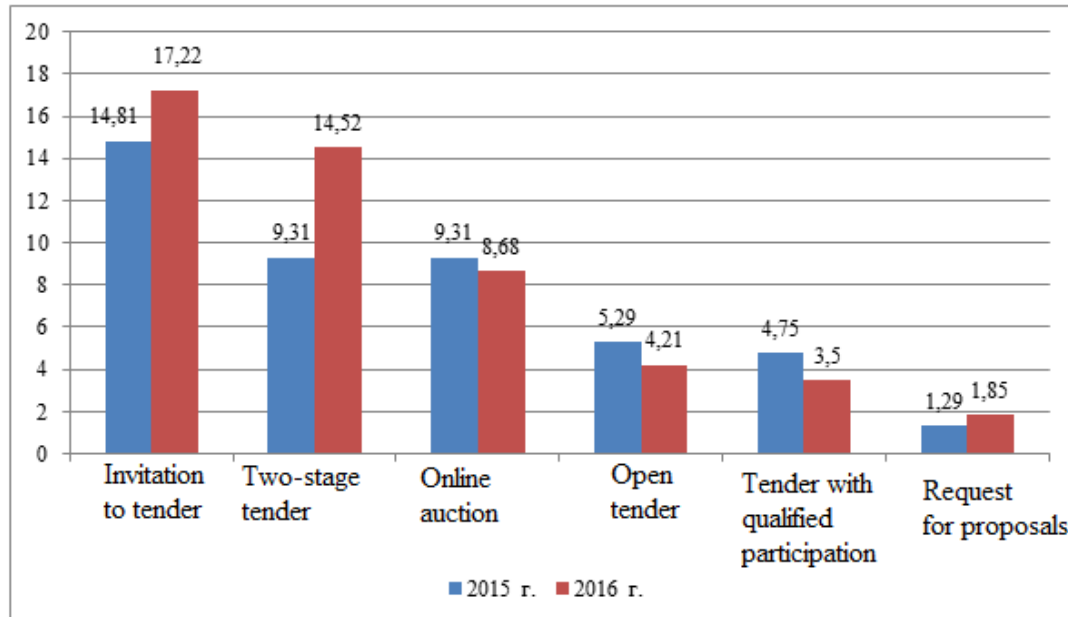
In addition to the data presented in Figure 1, it should be noted that in the first half of 2016 in absolute terms the total budget savings achieved as a result of competitive supplier selection procedures amounted to 210 billion rubles. Upon that, the economy growth in 2016 was 29% compared to the same indicator of the previous period (http: //economy.gov.ru/minec/about/structure / depfks / 44/20160729). Detalization of the overall dynamics within individual supplier selection ways shows heterogeneous nature of changes in process. A significant increase in the comparative savings is shown only by the results of two-stage tenders, the rest of positions have no positive dynamics, or, on the contrary, are characterized by a decrease in values of the indicator under study. In our opinion, decline in the rate of change of the comparative savings according to such supplier selection processes as an online auction and open tender should not be subjected to an unambiguous assessment. On the one hand, these procedures essentially correspond to the maximum extent to an objective to implement market principles in the process of organization of public procurement. In this regard, a decline in initial maximum contract price by more and more active involvement of business entities in procurement procedures in order to increase the level of intensity of competitive interaction should has a natural consequence in the form of increase in budgetary savings. On the other hand, the analyzed period refers to the stage of stagnation in the Russian economy, when a price reduction by a procurement party is limited by the need to maintain sufficient level of profitability which actually forms a financial safety margin of an economic entity. In our view, in the current situation decrease in the initial (maximum) contract price is constrained by unstable economic conditions, so it cannot be used as an unconditional criterion for evaluating the effectiveness of the instruments of the contractual public procurement system.

A rational supplement for the composition of performance indicators used in the study can be the average number of applications submitted by members to the right to conclude a state contract.

Table 1
DYNAMICS OF FILING APPLICATIONS DEPENDING ON THE METHOD TO PERFORM A PROCUREMENT

Supplier selection method	2015	2016
Two-stage tender	6.0	6.2
Online auction	3.2	3.3
Open tender	2.5	2.6
Tender with qualified participation	1.9	2.3
Invitation to tender	2.2	2.1
Request for proposals	1.5	1.6

Table 1 shows that absence of significant dynamics in the number of applications filed reflects the relative stability of the government procurement market throughout the period under study. However, on the other hand, in the projections for the near future the current situation allows the absence of preconditions to the active development of a competitive environment marked by the expansion of the participants of procurement procedures to ascertain. We formulated the statement which receives an additional substantiation in the conditions of supplement of the array with indicators by data presented in Figure 2.

Figure 2
AVERAGE NUMBER OF APPLICATIONS FILED BY ONE SUPPLIER SELECTION PROCEDURE, DEPENDING ON THE PROCUREMENT PRICE RANGES
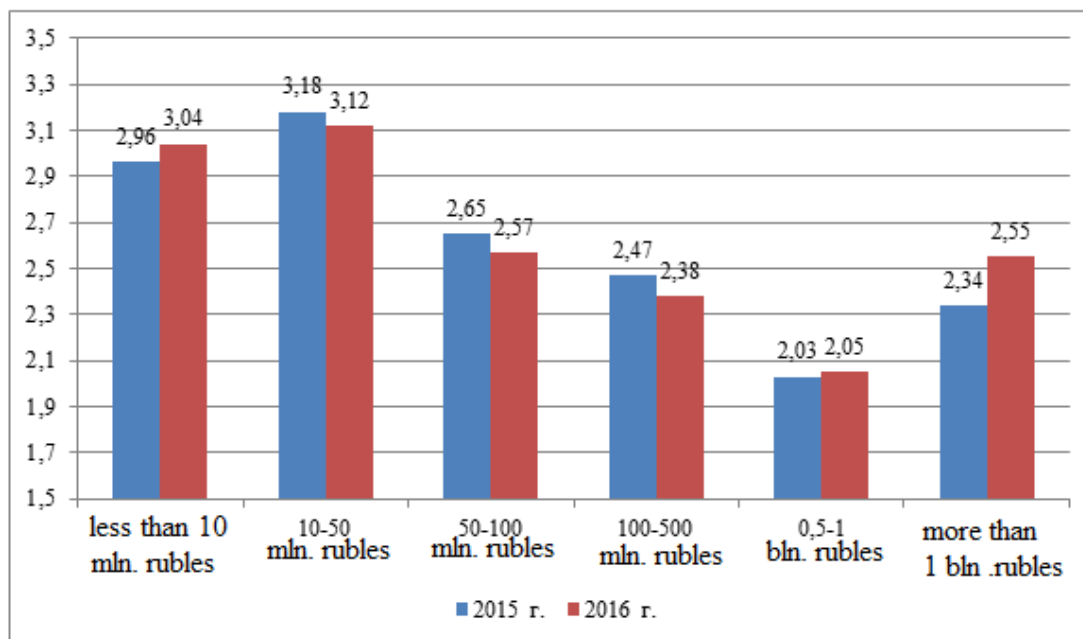
In the first half of 2016, the average number of applications from members submitted with value less than 10 mln. rubles and, as a rule, available for the intense competition between representatives of the mass segment of small and medium-sized businesses have increased only by 2.7%. Upon that, within the range of 10-500 million rubles the indicator shows a negative trend, that in the conditions of development of a Unified information system functional and testing of organizational procurement procedures is used as an indicator of necessity in objective research of the causes of the situation in hand.

It should be noted that in addition to the indicator of the average number of applications grouped using various criteria, a significant information load is caused by the study of the volume of state contracts concluded with a sole supplier. According to the Ministry of Economic Development of Russia, in the first half of 2016, this figure made 422.2 billion rubles (20.4% of the total volume of contracts), in 2015, its value was much higher - 603.1 billion rubles, and 27.2%, respectively [2]. Reducing the share of procurement procedures which at their core do not implement the basic principles of free market competition, should be subjected to unconditionally positive assessment. However, a study of controversial aspects of the contractual public procurement system may not be limited to monitoring and discussing its resulting indicators and requires substantive consideration of problem areas of its functioning with a view to further development of scientific approaches to overcoming them.

Generalization of the main violations in the regulated mechanism of procurement of goods, works and services recorded under the provisions of the contract system, indicates the presence of weaknesses in its functioning which prevent achievement of the objective of economic efficiency in public spending (Fig. 3)

Figure 3
CLASSIFICATION OF DEVIATIONS FROM THE REQUIREMENTS ESTABLISHED BY THE CONTRACTUAL PUBLIC PROCUREMENT SYSTEM IN THE RUSSIAN FEDERATION
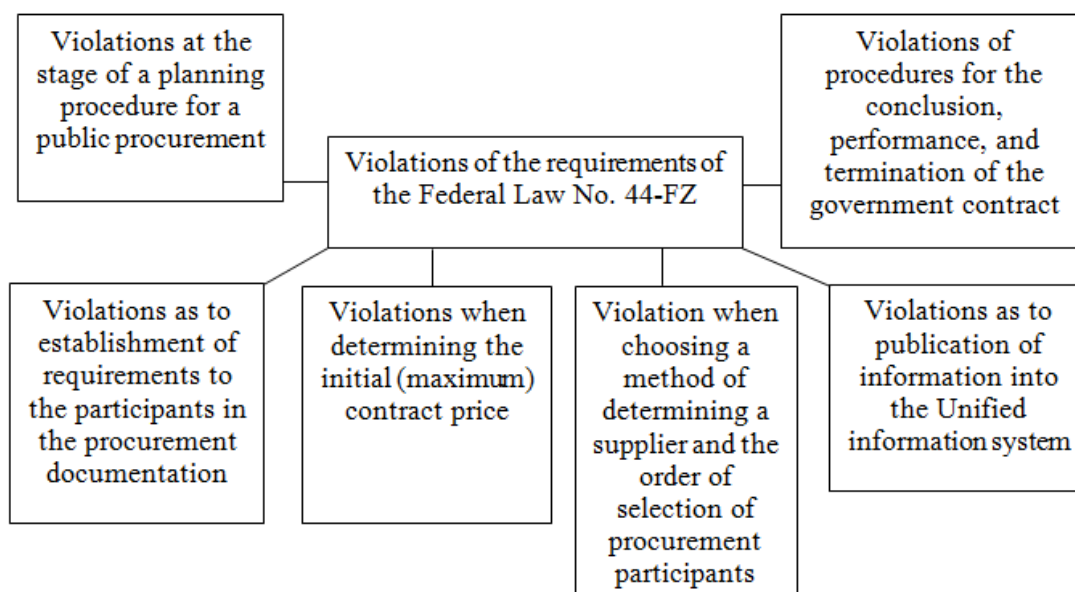
Turning to the economic interpretation of array of diverse violations as to legislation regulating public procurement, we should highlight a number of fundamental aspects. Pursuing the objective to establish a regulatory control for public procurement planning process by forming their plan and schedule, legislators sought to create an effective mechanism of preventive regulatory impact on preparation of a customer to the supplier selection process and the conclusion a government contract with it. Quick placement of information in the Unified informational system allows the principles of preventive controls to implement not only by the competent authorities, but also by involving representatives of the public concerned. Assessment of the current state of public procurement planning procedures indicates that the nature of the public disclosure of information by a state customer often requires demonstration of pooled data that does not allow conduction of an analysis of the procurement reasonableness, evaluation of their compliance with the goals and objectives of the implementation of government programs. In fact, customers continue to buy similar goods, works and services that differ significantly in performance and price that often leads to purchase of goods which have redundant application properties.

Establishment of unreasonable demands to participants of placing orders or to a subject of a procurement can be found in the content of the terms of reference which wording of provisions indicates that its requirements are met by the products which can be supplied only one of the participants in tender procedures. It is possible to qualify increasing complexity of the technical documentation and specification of requirements for an object of a procurement as excessive and laying the groundwork for restriction of competition and for fraud on the part of the customer only based on the results of the expert examination. The absence of actual alternatives to a subject study for each case separately upon carrying out the control activities is due to the fact that because of the high diversity of procurement objects an attempt to unify their parameters and delivery conditions is doomed to failure, because in most cases, it can lead to a mismatch between a subject and purposes of procurement.

A common tool for limiting competitive conditions for procurement used by unconscientious customers is a substantial decrease in normative period of work execution and services rendering set forth in the documentation about the purchase. This mechanism is used when ordering intellectual activity objects such as research work in the case, when in fact they have been made for the customer or the latter has had them in the form of analogues. Lack of time for performance of a task determines the lack of interest from a wide range of participants, so the purchase is carried out with a sole supplier in collusion with which the customer has previously entered.

The most important component to achievement of effective contractual procurement procedures is a justification of the initial price of the contract for its compliance with the level of average market indicators. This is due to the fact that in the process of overpricing, customer's officials include in the price remuneration of that size which they wish to obtain from the participant as a payment for the right to conclude the state contract with it. Using various schemes of intended restriction of the participants composition eliminates the objective impossibility to decrease prices in the bidding process, so the purchase would be performed at a sole predetermined supplier.

CONCLUSION

The study of current practice on organizing public procurement confirms the need for the development of methodological approaches to assess its economic efficiency. Along with the use of resulting indicators of absolute and relative budgetary savings, it is advisable to actualize the continuous monitoring carried out by the criteria of analysis of a competitive environment formed in the process of gradual development of the existing system. In particular, a priority of a subject study of indicators for the average number of applications submitted by members on the right to conclude a state contract, volumes and structure of procurement with a sole supplier is determined by the necessity of the public procurement market development by involving a significant number of subjects of various economic activities types, interacting with each other in free competition conditions. Supplementing the evaluation criteria does not imply a rejection of the traditional tools for assessing financial performance, however, it allows focusing on the formation of economic space which functions in accordance with the approved regulatory principles.

The most important criterion for evaluation of the efficiency of public procurement becomes a completeness and qualitative level of information disclosure of their content as a component of the data in the Unified Information System. Availability of monitoring the actions of participants at all stages of the procurement procedures opens up prospects for a full public observation being an adequate complement of state control procedures. In our opinion, in the context of the chosen topic, no doubt about the need for authoring and subsequent scientific discussion of indicators of information payload Unified Information System, as well as influence of public representatives not only on the algorithms of individual purchases, but also on the development of organizational and methodological tools of the system as a whole.

ACKNOWLEDGEMENTS

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INTERNATIONAL EXPERIENCE OF TAXATION OF INDIVIDUALS IN THE RUSSIAN FEDERATION

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ABSTRACT

One of the essential conditions for increasing the level of income and quality of life, the effective functioning of the economic security of citizens and the system of taxation is a rational managing by households of personal finance, which implies the need to form financial culture providing a comprehensive account of costs and incomes within the framework of financial planning. In turn, the low level of financial literacy of the population and fiscal discipline does not allow to establish an effective system of taxation, creates a tendency of citizens to unlawful acts in terms of evasion of tax payment.

The article presents and analyzes the experience of taxation of individuals in foreign countries. It considers the income tax rate in the United States of America and in Germany. Based on the example of Great Britain, a schedule approach of determining income of an individual for tax purposes is represented. On the basis of the analysis of taxation of natural persons abroad, the conclusions about the possibility of applying in the Russian Federation the instrument of vesting regional authorities with the powers on the introduction of taxes and change of tax rates in their territory. Moreover, the introduction of non-taxable minimum of income tax of income of natural persons, which exists in many foreign countries, will free from taxation of citizens with low incomes. It is necessary to consider the possibility of family taxation on the example of the United States of America and Great Britain.

Keywords: personal income tax, income tax, family taxation, progressive scale of rates, the exemption limit.

INTRODUCTION

A modern tax system of Russia began its development since the adoption of the first part of the Tax Code of the Russian Federation in 1998 and the second part in 2000. It was formed under the influence of historical, political, economic and social conditions and factors manifesting themselves in Russia in a particular period of time.

The need to reform the tax system in order to increase tax revenue in the budget of the Russian Federation requires an analysis of foreign tax systems with the aim of adoption of the positive experience of taxation of citizens and avoidance of some of the mistakes already made abroad. However, it should be borne in mind that the tax experience of a country is not always successful in the Russian practice.

It should be noted that the issues of income taxation are studied by Russian and foreign economists. In particular, such investigators are Saez, E. (Saez, 2013), Hodgson, H. (Hodgson, 2014), Pellegrino, S., Vernizzi, A. (Pellegrino and Vernizzi, 2013), Ibragimov M., Tufetulov A.

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THEORY

The best variant when studying foreign experience of taxation of natural persons will be the analysis of general trends of the development of tax systems, the revelation of regularities and the use of good practice adapted to our state. Compare taxation of natural persons in Russia and in foreign countries (Table 1):

Table 1
TAXES LEVIED ON NATURAL PERSONS IN FOREIGN COUNTRIES

Country	Taxes levied on natural persons in Russia and in foreign countries	
	income	property
The United States of America	federal income tax, income tax at the state level	Federal tax from inheritance and donations, inheritance tax at the state level, property tax at the state level, property taxes at the local level
Germany	income tax, church tax (fee)	property tax, legacy tax, tax from owners of vehicles , land tax
Japan	state income tax, prefectural income tax	property tax (immovable and land), inheritance tax, tax from owners of vehicles
Switzerland	Confederation income tax, cantonal income tax	immovable property tax, legacy tax, vehicle tax
	tax on net assets	
Great Britain	personal income tax	inheritance tax, property tax
France	income tax	hut tax, tax on buildings and structures, land tax, profession tax, tax on cleaning of territories, tax communications use

Based on Table 1, one can say that all taxes imposed on natural persons, both in Russia and abroad, can be divided into income and property. Tax on income of natural persons or income tax is levied in all countries but tax bases, rates and benefits provided for natural persons depending on their tax status, age, social and family situation are different.

The United States of America is a federal state in which the autonomy of authorities of regional (state) level is high. The States have considerable opportunities and rights in the introduction and establishment of taxes in the territory under their jurisdiction. Also the tax system of the United States is characterized by the parallel use of the main types of taxes. Minimum interference of the state in the economy allows to keep the tax burden at a low level compared with other developed countries.

A distinctive feature of the taxation of citizens to income tax in the United States is that this tax is levied at every level of the tax system, the tax rates are progressive, and every taxpayer has its own tax status, depending on a social and family status. The rates of income tax in the United States of America depending on the tax status of the taxpayer is shown in Table 2:

Table 2
RATES OF INCOME TAX IN THE UNITED STATES OF AMERICA AS OF 2011

Taxable income in dollars.				Tax rates, in %
Married couple (joint income)	Married couple (separate income)	Single family head	Single man	
Не более 16 700	Не более 8 350	Не более 11 950	Не более 8 350	10
16 700– 67 900	8 351–33 950	11 951–45 500	8 351– 33 950	15
67 901–137 050	33 951–68 525	45 551–117 450	33 951–82 250	25
137 051–208 850	68 526–104 425	117 451–190 200	82 251–171 550	28
208 851–372 950	104 426–186 475	190 201–372 950	171 551–372 950	33
More than 372 951	More than 186 476	More than 372 951	More than 372 951	35

Income tax in the United States of America is society-oriented, it takes into account the economic situation of different categories of people: from the gross amount of income, one deduces contributions to pension insurance, business expenses incurred in obtaining income (costs on clothing, travel expenses, books, etc.) and different allowable deductions from the income received in the form of dividends, interest, pensions (Adigamova et al., 2014). Non-taxable minimum of income tax of returns is also high. So, based on the Russian currency, non-taxable minimum in 2009 for couples filing a joint declaration was equal to 364,8 thousand rubles per year, for the spouses filing separate declaration and for single people - 182 400 rubles per year (with the dollar exchange rate of 32 rubles in 2009).

Also, one applies full exemption from individual income tax, additional discounts for people over 65 and the disabled, deductions: the costs of moving to a new residence, charitable contributions, the costs of advanced training and others. These deductions can be made in the amount of not more than 50% of adjusted gross income, and the remaining 50% can be deducted from income during 5 years.

The main property tax in the United States of America is a local property tax, which includes transport tax, land tax and tax on property of natural persons. Two groups of objects of taxation are differentiated: real estate (land and immovable fixtures, built for the purpose of its improvement) refer to the first; private property (tangible - cars, furniture, jewelry, livestock, crops, intangible – capital issues and cash) – to the second.

The tax base is the assessed value of property as determined by special official – an appraiser who lists the evaluation of the objects within jurisdiction of a particular self-government, which are subject to taxation of property tax. Rates of property tax at the state level are from 0,5 to 5%, at the local level - from 1 to 3%.

Property tax has the advantage associated with the identification of the tax base. Real estate is difficult to conceal, and its evaluation for tax purposes takes place regardless of the wishes of the owner. Also, due to the consolidation of the three taxes (transport, land and property tax levied on natural persons) costs on administration and control over the payment of this tax are reduced. The transport tax in the United States of America is also included in the cost of fuel, so the tax paid by those motorists who uses the vehicle more is higher.

The experience of the United States in the taxation of income and property of natural persons can also be applied in our country, with account taking for the peculiarities inherent in this state. It is proposed to adopt the procedure of taxation of income of individuals when tax rates are set not only on the principle of residence of a natural person but a financial and social status, tax status are also taken into account. It seems also possible to introduce the rules for

taxation of income, depending on the family situation of the taxpayer, to establish different rates for married couples with joint and separate income, for a single parent with a child as well as for people who are not married and have no children (Sevryukova and Belousova, 2016). In the area of taxation of personal property of natural persons, combining vehicle tax, land tax and the tax of property of natural persons allows to reduce costs of administration and control over the payment of the tax, and levy of vehicle tax which is included in the price of fuel is more equitable and reflects the negative impact of vehicles on the pavement and the environment, as the tax is paid only automobile owners directly using their vehicles. The experience of empowering of regional authorities with wide powers to impose taxes and change in tax rates in the territory under their jurisdiction seems positive, which allows the executive authorities vested with powers in the field of taxation to take into account at the same time economic and social conditions of each region.

In Germany, income tax is classified as joint tax, the takes of which shall be apportioned among the various levels of budgets. The budget of the federal and land authorities has 42,5% of the levied income tax, the remaining 15% goes to municipal budgets. The tax rate on personal income in the interval between 0 and 42% (Table 3):

Table 3
RATES OF INCOME TAX IN GERMANY AS OF 2013

	Payer category		Marginal rates, in %
	Single payer	The spouses who pay tax jointly	
The tax base in the euro	до 8 004	до 16 008	0
	8 005 – 13 469	16 008 – 26 938	14-24
	13 469 – 52 881	26 938 – 105 762	24-42
	52 881 – 250 730	105 762 – 501 460	42
	более 250 730	Более 501 460	45

Non-taxable minimum is 360 180 rubles per year - for single people, 720 360 rubles - for the spouses (with euro rate of 45 rubles in 2013). The total income is obtained by summing up the positive results and losses on certain types of income. For taxpayers who are over 64 years, this quantity is reduced by the amount of the reduction according to the age. Special and unforeseen expenses are deducted from the remaining amount. The special expenses include costs, having the character of the future security as well as further training costs, professional education and others. Special expenses may be the costs of support for charitable, church, religious, scientific and other institutions, recognized especially in need of help. Extraordinary expenses are internally costs if they exceed the set limits (cost of stay in the hospital, disability, caring for a family member).

The main feature of the income taxation in Germany is the availability of the system of family taxation. The essence of the concept of family taxation is that the features of the property status and earnings of individuals who are in a certain degree of kinship shall be taken into account when determining the procedure of taxation, and in some cases may be taxed jointly. The persons entitled to apply joint taxation are:
a) the couple living together;

б) the taxpayer, widowed during the tax period following the year in which the spouse died, if he and his deceased spouse at the time of death did not live separately a long time;

в) divorced taxpayers if for the both at the time of divorce the following conditions for the joint taxation were met and one of the spouses in the same year got married and for him and the new spouse the conditions of the joint taxation are executed.

As a result, the tax is accrued for the spouses on half of the total income of the spouses, and then doubled. When the difference in the income of the spouses is significant, this form of taxation of income is very beneficial for payers, because it leads to significant cost savings as compared to the taxes paid separately at the general tax regime.

In the area of taxation of income of natural persons the experience of Germany as well as of the United States of America can be applied in this country in relation to the system of family taxation. It becomes possible the introduction by the tax on income of natural persons by age of discounts for those who have reached the retirement age as well as the possibility of reducing the income for the amounts of contingencies (for expensive treatment, due to disability, death of a family member) if they have exceeded the allowable limit.

Unlike many other countries, income tax in the UK will be charged not with the total income of the taxpayer, but in parts - schedules. In total, there are six schedules (Table 4):

Table 4
SPLIT OF INCOME OF THE NATURAL PERSON IN GREAT BRITAIN BY SCHEDULES

Schedules	Type of income
A	property income to the land, buildings, etc.
B	income from forest property used for commercial purposes, if not taxed at the shedule D
C	income from certain types of government securities, securities of foreign governments on which the interest is paid
D	profits from the production commercial activity, personal income of the liberal professions, income from securities not taxed at shedule C; income received in the form of interest on loans; income received abroad and transferred to the UK
E	labor income; wages, salaries and pensions of workers
F	dividends and other income distributed by companies

The tax law of Great Britain treats a married couple as a single taxpayer. It is believed that a wife is dependent on her husband, who fills in the declaration. Any income the wife is added to the income of her husband, and the husband has the right to be offered extra personal allowance. If the spouses have children, non-taxable amount increases by 7 pounds a week. It also provides personal allowances for people aged 65-74 equal to 9490 pounds (512 460 rubles), over 75 - 10 090 pounds (544,860 rubles), additional discounts for the blind and visually impaired - 1980 pounds (106 920). The tax rate on income of the natural persons in the UK is 10% for income not exceeding 2440 pounds. (131,760 rubles), 20% - for income that is not more than 35 000 pounds (1 890 000 rubles), 40% - for income being not more than 150 000 pounds (8.1 million rubles), for income over 150 001 pounds, the rate of 50% is applicable (with the rate of pound sterling of 54 rubles in 2013).

METHODS

The taxes levied on natural persons in Russia and abroad are similar to a large extent, but the differences in the taxation of income and property of individuals in domestic and foreign countries indicate t the possibility of using foreign experience to reform our tax system. For instance, income taxes in the United States of America are more society oriented to support the poor and the middle class, which is not observed in the Russian Federation.

The procedure for calculating each of the tax levied on natural persons in the Russian Federation has its own specific individual features. When calculating the tax on personal income, one should pay particular attention to the correctness of the tax bases and the choice of the appropriate tax rates as well as the use of tax deductions that reduce the tax base and affect the final amount of tax (Sevryukova and Belousova, 2016; Nemirova and Tyurina, 2015).

The number of taxpayers-the natural persons- in the Russian Federation grows by 6-10% every year. Among the taxpayers executing the tax obligation on payment of the tax for themselves, the largest proportion being equal to 95-96% is the so-called other natural persons, their number in 2014 had reached a value of 9,3 million people. The second place is occupied by individual entrepreneurs, the number of which was equal to 335 000 people in 2014, and the share is 3-4%. The third place is shared by the heads of the peasant (farmer) households of total population in 2014 - 13 thousand people and the share of 1-2% of all taxpayers to file a tax declaration according to form 3-PIT. The lowest share of about 0.1% are notaries and other persons engaged in private practice.

The greatest number of taxpayers pay tax at the rate of 13%, their share is 93-95%, and their number in 2014 was 91 million people. The lowest number of taxpayers was subject to a tax at the rate of 15%, that is, they are tax non-residents of the Russian Federation, their share is about 0,01% of the total number of taxpayers.

The tax on income of natural persons is one of the most important of budget-forming taxes in our country and is about 38% of the total tax revenues of the consolidated budget. Within the period from 2011 to 2015, there is a positive dynamics of tax revenues to the consolidated budget of the Russian Federation: the amount of tax increases annually, from 2011 to 2015 the amount of the tax revenue increased by 1,4 times. However, the growth rate of the tax is gradually declining: in 2011, the amount of income tax on personal income to the consolidated budget of the Russian Federation was equal to 1 994 869 291 rubles and the growth rate was 13%, while in 2015, the amount of income tax was equal to 2 806 507 629 rubles and the growth rate amounted to 5%. In 2015, there was a marked decline in tax revenues associated with the economic crisis, a sharp drop in the ruble exchange rate and the decline in oil prices, which caused lower incomes of population and, as a result, reduced tax base on this tax (http://www.gks.ru).

Property taxes on the taxpayers-natural persons, namely, transport, land and personal property tax, also play an important role in the tax system and the formation of tax incomes of the state budget. The share of the transport tax levied on natural persons, in the total amount of income of the consolidated budget of the Russian Federation is 9-10%. The share of land tax levied on individuals and tax on property of individuals is on average 2-3% of the total consolidated budget of the Russian Federation (http://www.roskazna.ru).

Despite its small share of the income of property taxes in total revenues of the consolidated budget of the Russian Federation, about 13-16%, they are a key indicator of

security and well-being of citizens, as registration of the objects of taxation of property allows to monitor whether the taxpayer-natural person - has vehicles , real estate and land in the fate of the property, and to compare these data with his declared income that allows not only to effectively impose property taxes on citizens but also to prevent the understatement of the tax base, to identify and eliminate the possibility of tax evasion on income of natural persons.

RESULTS

Having analyzed the taxation of individuals in some foreign countries, one can single out the following areas for improvement of the taxation of natural persons in the Russian Federation, taking into account the peculiarities of foreign tax systems, the use of which will positively influence the state of the Russian tax system.

First, by way of the example of the United States of America, it becomes possible to empower regional authorities to impose taxes and tax rates change in their area, which will allow the executive authorities vested with powers in the field of taxation, to take into account at the same time economic and social conditions of each region.

Secondly, the introduction of non-taxable minimum of income tax of personal income, which exists in many foreign countries, will free from taxation of citizens with low incomes. The orientation toward social taxation of individuals can be realized through the support of certain layers of the population, increasing the amounts of tax credits and deductions, and considering the use of family taxation by way of the example of the United States of America and the United Kingdom.

Thirdly, the planned introduction of a progressive scale of tax rates on personal income, aimed at increasing the tax burden on individuals receiving income above the national average, will allow to withdraw money from the citizens who receive excess profits, and to increase the tax revenue of the country's budget.

CONCLUSION

Summarizing, it should be noted that it is necessary to pay attention to international experience in the field of taxation of income and property of natural persons. With all the variety of taxes collected in Russia, without familiarizing with the tax systems abroad, it is impossible to fully understand the peculiarities of their components, the possibility of applying, the relationship between themselves and with other payments, so the use of international experience in the taxation of individuals, adapted to the Russian tax system, will positively influence the overall condition, the living standards of Russian citizens and will increase the size of tax revenues to the Russian budget.

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THE PROBLEMS OF ADAPTATION AND EDUCATION IN TERMS OF THE MODERN MIGRATION POLICY IN THE RUSSIAN FEDERATION

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ABSTRACT

Among key questions of the migration policy in the Russian Federation the processes of forced migration have become significant. The study is aimed at examining migratory activities and the problems of refugees' resettlement from the Ukraine that inevitably cause various social consequences for Russia. The starting point is a brief examination of a dominant perception of 'migration problem' in the Russian Federation. This is followed by the discussion of some measures for creating favorable conditions for the Ukrainian refugees. The questions of providing educational services to persons who forcedly left Southeast part of the territory of the Ukraine have been established. The issues which schoolchildren-migrants face in the course of studying in Russia have been identified. In this regard, the presented approach determines the investigation of tendencies of migratory movements, which allows not only to reveal specifics of educational migration in relation to the category of forced migrants, but also to present a comprehensive set of measures for ensuring social adaptation of children and youth.

Keywords: migration, forced migration, refugees, educational migration, social adaptation.

INTRODUCTION

Migration represents a difficult public phenomenon exerting a comprehensive impact on various parties of social and economic life of population. In present conditions migration policy is one of the priority directions of Socio-economic development of a state (Trofimova, E.V., 2012). Migration is increasingly being acknowledged as the issue that needs the global approach and coordinated responses. States don't only discuss migration issues at the bilateral level, but also regionally in worldwide arenas (OECD, 2012). These circumstances dictate the need to develop considered and expedient decisions from public authorities in the field of migration who are capable to create favorable environment for the improvement of a migratory situation. Innovative and evidence-based policies and programmes are needed to enhance the development

potential of migration. To this end, comparable, reliable, timely and accessible data are needed to assess migration trends better and, in particular, to enhance the impact of migration for human development at national, regional and international levels (Review of IOM's Migration Crisis Operational Framework International Organization for Migration, 2014). Methods of mainstreaming migration into development planning should be promoted as should mainstreaming migration into resilience and adaptation strategies (Science for Environment Policy, 2015).

It becomes clear that an increasing attention to the problem of the forced migrants from scientific community (see the works of Sabayeva, A.V., 2014; Sazon, K.D., 2014; Popova, A.R. and Timofeeva, T.S., 2015; Grishina, A.V., 2016; Lunin, S.L., 2016; Brown, S.K., Bean, F.D., 2012; Jauer, J., Liebig, T., Martin, P., Puhani, P., 2014; Zetter, R., 2014), and from the public (Mikhaylov, V.P., 2016; Re-conceptualizing Refugees and Forced Migration in the 21st Century, 2015) points out its relevance and the need to develop conditions for successful course of processes of public integration both for host and forced migrants.

DATA AND METHODS

The development of forced migration sociology cannot be based simply on the accumulation of data through a proliferation of empirical studies. The research needs to be guided by questions and approaches, based on broad theoretical understanding. In order to achieve the research objectives in the article, descriptive method and quantitative analysis employed in contemporary sociology have been used.

RESULTS

At the present time migratory processes in the Russian Federation (RF) are characterized by a difficult and inconsistent character in view of the fact that they are influenced by a set of conditions and factors, that differ in features. One of the significant questions facing Russia today is forced movement of the population, i.e. forced migration (Population shift, 2012; Granting provisional asylum in the territory of the Russian Federation, 2016). Especially strong this problem increased in connection with the events in the Ukraine: in 2014 within several months there was a big social group of refugees that served as a reason for the emergence of a set of social difficulties demanding rapid response and timely regulation at various levels of power.
In the first place, it is important to note that, a special feature of this group consists in the unexpectedness of its emergence in the territory of Russia, both for the citizens of Russia, and for the immigrants. In the second place, a conscious purposeful policy of the Ukraine authority on physical extermination of inhabitants in Southeast part of the territory is conducted. Thirdly, this category of people is in a difficult material and moral condition.

According to the Federal Migration Service (FMS), in 2013 in the territory of the Russian Federation 34 697 compatriots and members of families were registered, in 2014 – 106 319 people, by the first quarter of 2016 – 36 188 immigrants (Head department concerning migration in Russia, 2016). The data provided by V. Koshtel, the head of the European office of Management of the U.N.O. High Commissioner for affairs of refugees, are announced in number of 730 thousand people, at the same time it is highlighted that only about 170 thousand

compatriots addressed to FMS (Pankova, S. V., 2014). From the presented statistical information it is vividly seen that the indicators of the number of refugees significantly differ and do not give an unambiguous idea about a real situation of forced migrants in the territory of Russia. This circumstance, in turn, causes the emergence of some uncertainty in the formation of accurate legal and organizational regulation mechanisms of migration flows.

In 2014 the government of the Russian Federation and the Federation Council developed and introduced a number of measures for creating favorable conditions for the Ukrainian refugees, among which it is necessary to distinguish: the employment process simplification, the improvement of the order to obtain Russian citizenship and a procedure of refugees' staying in the territory of Russia (About refugees, 2014). These measures promote the inflow of refugees to various Russian territorial subjects as they simplify the procedure of entry and wellbeing in the territory of the country for this category of citizens.

It should be noted that the greatest attention is paid to the questions of labor migration. At the same time a number of questions of social character remain unresolved, notably, the problem *of educational* migration taking into account the possibility of its use for social development in the country, that also presupposes to solve the problems *of migrant children's adaptation* to the education system. Monitoring results show, that on September, 2015, 86, 7 thousand Ukrainian citizens are admitted to the establishments of educational Services of the Russian Federation. In such situation today there is an urgent need to discuss questions of providing educational services to the persons who forcedly left Southeast part of the Ukrainian territory and to create the corresponding conditions for The adaptation of migrant children (5, 2 thousand people) who make up a rather extensive group, both on the numerical structure, and the territorial national factor.

The analysis of the current situation shows that the problems of compatriots' training demand management and control within government departments in the form of concrete measures, first of all – in the field of standard legal regulation.

Regarding **general education**, all citizens who arrived from the territory of the Ukraine, both having the status of refugees, and temporarily resident in the Russian Federation get appropriate education in the general education in educational organizations according to the article of the Federal law "About education in the Russian Federation" (About education in the Russian Federation, 2016). It can be refused in inclusion in certain state or municipal educational organizations only because of the absence of empty seats. In case of refusal, parents (legal representatives) address directly to executive authorities to solve the question of his/her acceptance into other educational institutions. Also the letters, regulating the work on prime measures to ensure the rights of children who arrived from the Ukrainian territory on receiving public and free pre-school, primary general, main general and secondary general education in the educational organizations of the Russian Federation, are sent by Minobrnaukaya to the heads of executive authorities of Russian territorial subjects (including the Republic of Crimea and the city of Sevastopol), who exercise public administration in Russian educational system (About training of the children arriving from the territory of Ukraine, 2014).

Regarding **professional education**, it is possible to accept Ukrainian citizens to train in programs of professional education:

- within ancillary allocated reception quota;

- to the places established by an educational organization according to the results of a competition in the distribution of target figures;
- under contracts on education at the expense of natural and legal entities means (About the statement of an order of reception on training in educational programs of secondary professional education, 2016).

As for *secondary professional education*, the list of the educational organizations of higher education to which occasional seats for reception are allocated for the training of citizens (on operating data – 3 370 people) is determined by secondary professional education programs. The executive authorities who carry out functions on control and supervision in education have defined target figures of reception for 2015/16 academic year taking into account the requirements of the persons who arrived from the Ukrainian territory to receive secondary professional education.

Concerning *higher education*, for the organization of persons' reception for receiving higher education, the governing body in Russian Federation realized the following actions:
- meetings with rectors of higher educational institutions are held, during which the explanations on enrollment conditions of students from Southeast Ukrainian regions are made;
- information letters, concerning the training of Ukrainian citizens in 2015, are sent to the Association of non-state higher education Russian institutions, the institutions of executive power of territorial subjects in the Russian Federation, which exercise public administration in education, and to federal branches of executive power under the authority of which educational organizations of higher education are found;
- information letters are directed to subordinated higher education institutions of the Ministry of Education and Science. It is reported that there is no need for the education and (or) qualification documents received in the Ukrainian territory to be carried out in the Russian Federation (About the statement of the Order of reception on training in educational programs of the higher education, 2015).

On the basis of declared requirements, there is a list of 11 higher education institutions of Belgorod, Voronezh, Rostov region, Stavropol territory and the Republic of Crimea for citizens' admittance to whom an additional quota of reception is allocated. The selection of candidates is carried out by the results of selection events and additional entrance tests of professional and (or) creative orientation which are independently held by higher education institutions. The Ukrainian citizens confirming their status of compatriots, equally with the Russian citizens can enter universities by the results of a competition and apply for a training within the budgetary places. The Ukrainian citizens confirming their status of compatriots can enter the university, having passed the unified state examination (USE) or internal entrance tests conducted by an educational organization independently. The list of joining tests which are carried out by the educational organization has to coincide with the list of objects in which it is necessary to present the results of USE for entering an educational organization. Examinations in Russia are carried out at the enrolment on all specialties and the directions for the preparation.

It is important to note that owing to a difficult humanitarian situation in Southern Ukraine, additional conditions for Unified State Examination for young people were organized. So, in the 1st of October, 2015 on the budgetary basis of training in 283 higher education institutions of the Russian Federation 1 933 Ukrainian citizens were accepted (1 929 people – at state universities and 4 persons – in non-state higher educational institutions).

In 2015 the citizens of the Ukraine (4 206 people) without attending classes passed intermediate and state final examination in higher education institutions to which additional quotas for the reception of Ukrainian citizens were allocated. In addition, within the quota established by the Government of the Russian Federation, 348 candidates were admitted to 112 higher education institutions for training in bachelor's degree programs, specialist programme, magistracy, postgraduate study, internship, assistantship training.

It is necessary to pay attention to that fact that, despite the taken measures for the regulation and correction of educational process in the Russian Federation, the operating migration policy and the legislation in this sphere remain insufficiently effective. Specified actions have 'primary organizational character' and do not solve all arising problems in this area as are directed, mainly, to the possibility of persons' arrangement in educational institutions. Besides, essential in this case is a problem of social well-being of displaced people in new conditions – their subsequent psychological *adaptation* in the education system. Researches in the field of social and economic aspects of adaptation, socialization and rehabilitation of families of refugees indicate that psychological problems have been caused by complex character and have exerted influence upon all fundamental personality spheres: informative, emotional, strong-willed, motivational and the sphere of communication (Methodical recommendations "Psychology and pedagogical conditions of adaptation of children from families of refugees, citizens of Ukraine, in the Russian education system", 2016).

In general it should be noted that the adaptation of children in the Russian Federation from the families which forcedly left the territory of the Ukraine is always carried out taking into account educational activity. It corresponds to the general policy of the state concerning measures for immigrants' adaptation. So, within the Federal target Russian program for 2011–2015 approved by the resolution of the Russian Federation government from June 20, 2011 No. 492 (About the Federal target Russian program for 2011 – 2015, 2012), the Institute of peoples of the North – RGPU named after Herzen realized the project on the basis of which the educational and methodical complex for migrant children was presented taking into account communicative orientation and functionality. The structure and content of the educational-methodical complex for children includes textbooks for training in Russian, methodical recommendations for teachers, and also didactic r materials of different levels of complexity. This educational and methodical complex is developed for the children subject to 'a dialogue of cultures' and corresponds to age and psychological features of those, to whom Russian is not the native language.

As a particular example take the following: on the basis of retraining programs of the Crimean teachers to other Russian Federation territorial subjects the methodical recommendations were submitted, dealing with training of displaced persons and refugees from the Ukrainian territories, considering the difference in educational programs of Russian and Ukrainian schools.

For ensuring psychological and social adaptation of the children who have got into a difficult life situation, the federal state educational standards of general education provide the inclusion into the structure of Correctional Education Programs, directed to the organization of comprehensive psychology and pedagogical medico-social support of the persons who have got into a difficult life situation taking into account their own health and features of psychophysical development. This program has complex character and provides:

- the support of the pupils who have got to severe vital conditions, providing opportunities to receive an education of good quality in the unity of indoor and out-of-class activity, in the system of organizational and pedagogical work of a school and a family;
- the unification of this category of pupils into the organizations which carry out educational activities;
- the rendering of psychologic-medico-pedagogical support to each child in difficult vital conditions.

For example, in order to prepare conditions for the continuation of school students' training from migrant families the adaptation center in educational institutions of Veliky Novgorod region has been created. Its main objective is to assist families of migrants and the displaced. The basis for the inclusion into an adaptation group is a direction which is given by governing bodies of education and an application of parents. The admission for a group is realized on the basis of the number of trained persons according to age distribution. The educational program includes carrying out of an intensive course of occupations. The structure of the running group which coordinates the work of the centre includes an educational psychologist, a social teacher, children-migrants' parents, the representative of a management board of a general education organization. The goals of the activity group imply to ensure the educational process, the management of adaptation groups, the maintaining of personal cards of children's development, the implementation of educational programs, etc. The educational program consists of three sections: standard and legal bases, the program 'Bases of the Russian language', the program of psychological support (Methodical recommendations about the organization of work of adaptation groups for children of migrants in the preschool educational and general education organizations of the Novgorod region, 2014).

However, despite the taken actions and initiatives for the successful adaptation and the integration of children into the society, still there have been a large number of questions, which demand further study.

The analysis of the current situation shows that still remain the problems of psychological needs of refugee children – actual and, undoubtedly, requiring special attention: an exit from a post-traumatic state, overcoming communication barriers and difficulties in training. Despite the existence of specialized centers of psychological assistance to children-refugees in many Russian regions, many of immigrants remain one-to-one with their problems in a foreign country. It turns out that everyone is forced to learn to live in new surroundings, which are not always comfortable.

As for the organizational and pedagogical aspect, first, integrated comprehensive training courses to work with children-refugees suitable for the activity in various conditions, have not still been developed. Secondly, the existence of differences in educational programs of two countries makes alignment of new pupils' knowledge to the level of the Russian school students problematic.

CONCLUSIONS

The presented article demonstrates that the problems that migrants face are closely interconnected and difficultly differentiated as they have been caused by one another. Their complex solution is possible only by means of elaboration strategies in education taking into

account psychological aspects of each displaced person in new sociocultural environment, thus it will lead to more successful course of the above-stated processes.

Summarizing the problems of refugee children's adaptation to the training process, it is possible to single out the most significant of them:

- language barrier;
- socio-cultural barriers in the conditions of the regional specifics reflecting the general level of tolerance;
- close cooperation with one another;
- discrepancy in the systems of values, self-realization and self-identification;
- divergence between Ukrainian and Russian types of the schools, in the norms of educational training organizations and studying and education self-organization, in different means and conditions within educational mechanisms;
- the center of "the problem field", i.e. cruel stress, physical disbalance of a child (Methodical recommendations "Psychology and pedagogical conditions of adaptation of children from families of refugees, citizens of Ukraine, in the Russian education system", 2016).

In this regard we suggest adding and specifying the existing measures for the ensuring of a successful child's adaptation in new conditions for training. So, the effective instrument of the assistance of adaptation of children, in our opinion, is:

- intentionally created educational environment which allows to minimize arising difficulties of sociocultural adaptation and promotes children's refugee integration into the Russian society;
- careful development of a child's training program support as an effective means of children's adaptation in the conditions of educational organizations;
- the increase of pedagogical employees' professional competence in educational organizations for migrant children training in Russian;
- the overcoming of language barriers, social and psychological, language and sociocultural adaptation of migrants' children by means of: 1) the preparation of methodical information and other materials on intensive training in Russian, taking into account communicative orientation; 2) the implementation of monitoring of activities for teaching Russian; 3) the development of didactic materials of various complexity levels;
- the training of children in the individual curriculum within the mastered educational program in the order established by local regulations;
- the monitoring procedure of a purposeful usage of budgetary funds for the creation of conditions to migrant children;
- the improvement of acts in the sphere of regulation and optimization of services to persons who forcedly left Southeast part of the Ukrainian territory;
- the organization of services of school mediation, assuming effective mutual cooperation of entities of the educational system, forming social mentality, intelligence, social partnership. This mechanism is to provide impartiality of administrative decisions in school community stratifications into social groups, in particular, between 'local' pupils and learners from migrant families.

In conclusion it is essential to mention that these assigned specified measures have no exhaustive character and cannot resolve all the above-stated problems. However they promote to lessen negative consequences, to reform the educational system and to develop effective mechanisms of regulation of educational migratory processes.

SUMMARY

In this paper some of the difficulties of forced migration in the context of rapid global change have been examined. In particular, the problems of education and adaptation of refugees from the Ukraine in the conditions of modern migration policy have been determined. Forced migration of citizens, who are in different sociocultural environment, puts them before the need to adapt to new vital conditions. In our opinion, for the improvement of the current situation, besides the creation of an effective mechanism of legislative regulation, accurate normalization of processes of fugitives it is necessary to improve the organizational and administrative mechanism children's and youth's educational adaptation, and also to coordinate joint efforts on the development of adequate measures of help to persons who left their state forcedly. Therefore in these conditions further detailed, complex investigation of the above-stated problems will promote the development of the Russian Federation economy, the improvement of manpower and educational potential, the expansion of its economic and geopolitical horizons.

CONFLICT OF INTEREST

Authors confirm that the submitted data don't contain the conflict of interests.

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FUNDS OF INNOVATIVE ACTIVITY STIMULATION AND THE SPECIFIC OF THEIR FUNCTIONING

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ABSTRACT

*At present to the number of universal principles of effective management one can refer scientific and innovative activity, by means of its emphasis as priority ways for national development and corresponding maintenance for its financing level. The article substantiates the necessity to analyse the functioning of non-state funds of support of scientific, scientific and technical and innovative activity in the Russian Federation. **Findings:** The most essential aspects of resource providing non-state funds have been established. The problems constraining the system development of creation and functioning of non-state funds of support of scientific, scientific and technical and innovative activity have been identified. The improvement recommendations of activity of funds promoting more effective organization of conditions of the implementation scientific, scientific and technical, innovative support have been identified at the present stage. **Improvements:** The presented approach determines the basic factors of fund development, which can serve as a guide to the process of formation and implementation of fund policy. It can be used to design a long term strategy for the development and governance of fund management.*

Keywords: fund, fund of support of scientific, scientific and technical, innovative activity, the company with the state participation, financial stimulation.

INTRODUCTION

The influence of science on people's lives and modern society happens against a sharp rise in the price of scientific research, resource intensity and growth, making the prospect of scientific support one of the most difficult both for developed states, and for countries with economies in transition. The international experience shows that the priority problem of state innovative activity serves the creation of favorable environment for the development of scientific and innovative activity as key link in production of scientific knowledge. Thereby, the maintenance of innovative activity acts as the mechanism of updating of strategic objectives of innovative policy in the structure of state regulation. The matter is in detail considered in the works of A.A. Druyeva (Druyeva, A.A., 2012), K.A. Denisov (Denisov, K.A., 2014), A.A. Gudkova, Z.R. Pliyeva, T.I. Turko (Gudkova, A.A., Pliyev, Z.R., Turko, T.I., 2015), A. Atkisson

(Atkisson, A., 2015), T.V. Polteva, A.A. Bower (Polteva T.V., Bower, A.A., 2015), S. Skochmer (Scotchmer S., 2014), etc.

The world economic outlook shows that the financial security of scientific and innovative activity in the majority of the world's most powerful countries is characterized by a *target* character and is focused, mainly, on the support of basic research. In the Russian Federation (RF) the programme-target approach is also applied: the programs on science and technology are formed to provide a full innovative cycle from scientific research before the introduction of scientific and technical products in production.

Within the implementation of federal target programs the government of the Russian Federation takes measures for ensuring the progress of innovative infrastructure, the support of priority schools of sciences, the development and commercialization instruments in each separate case. Besides, the issues on attraction of financial resources from non-budgetary sources have been resolved. In particular, various actions for joining of business communities' representatives to subsidizing of research by means of joint financing of works are offered by the organizations, but within the limits of the directions of scientific research, actual for the state. It has basic value in the period of economic and financial shocks as the introduction into production and public life of the world community of scientific achievements has to promote ways of overcoming the crisis.

The experience of the world's leading countries testifies to an important role *of funds* as independent subjects of financial infrastructure in research funding systems. Fund is a vide area of research and many researchers have contributed to the development of fund system. Specifically, various aspects of the development of funds abroad are analyzed by J. Holland (Holland, J., 2014), J.D. Morley (Morley, J., 2014), Ch. Joseph and H.G. Hong, (Chen, J., Hong, H.G., 2013), J.M. Mannon, and N.M. Blatherwick (Mannon, J.M., Blatherwick, N.M., 2012), D. Ardia, K. Boudt (Ardia, D. Boudt, K., 2013) and others.

DATA AND METHODS

The aim of the research is to reveal and compare the functioning of non-state funds of support of scientific, scientific and technical and innovative activity in the Russian Federation that allows to state the measures for the improvement of funds, to approach objectively and differentially to the solution of the problems constraining the development of the system of funds of support of scientific, scientific and technical, innovative activity in the Russian Federation. It gives a chance to provide the growth of innovation activity.

To achieve the research objectives through the comparative analysis of organizational and economic aspects of the activity of non-state funds in the Russian Federation has been carried out.

RESULTS

Funds are understood as the organizations which possess special status and realize the financing of different programs and projects (Saltykov, B.G.,2016). The foundations which are set up on regulations and characterized by strict logicality of the mechanism of the functioning promote the updating of innovative activity at different stages – from fundamental science, applied research – to effective introduction of scientific and technical developments in the market and the formation of new scientific intensive innovative organizations. In this sphere the

main objective of the state as a source of science funding and innovative activity is the formation of "constant capital investment" mechanisms for the implementation of advanced highly effective scientific and technical programs through the system of funds (SIND Fund, 2016).

At the same time, it is necessary to emphasize that today in the Russian Federation the financial policy of innovative funds does not exert considerable impact on the formation of a good climate for innovation. It means that this, very effective and successfully used instrument of stimulation of innovative activity is underused; therefore this system has an essential reserve of growth and the hidden potential of innovative development.

The experts, who are engaged in studies on Russian economic development, are often made to look for financing sources, thereby realizing mechanisms of mutually advantageous forms of state and business interaction. Currently, the major sources of funding of innovative projects are special off-budget funds of financing research and development activities (RDA) which are allocated by regional authorities, sole traders and enterprises. Thanks to it an effective competition is generated and it serves as the incentive for innovative activity increases.

In this connection we have addressed to the acting practice of creation of *non-state funds of support of scientific, scientific and technical and innovative activity (SSTIA)*. First of all we analysed the legal basis of the functioning of funds in the Russian Federation (in particular, such documents as "Civil Code of the Russian Federation" (CJSC Konsultantplus, 2016), the Federal law "About science and state scientific and technical policy" (CJSC Konsultantplus, 2016), the Federal law "About non-profit organizations" (CJSC Konsultantplus, 2016) were investigated. It is established that the Fund is a unitary non-profit organization which is founded by citizens/legal entities on the basis of voluntary property contributions and pursues social, educational and other aims. The fund uses property for the purposes which are defined by the charter. For the realization of business activity funds have the right to form economic societies or to take part in them. Thus, it is possible to define the SSTIA non-state funds as the unitary non-profit organizations formed at the expense of the property contributions made on a voluntary basis and the sciences, having support as the main objective, scientific and technical, innovative activity. At the same time the SSTIA non-state funds belong to the category of private property.

In order to investigate the functioning of funds of support of SSTIA it's essential to trace the activity of non-state funds which are formed by the companies with state participation. The comparative analysis of their organizational and economic characteristics has been held. Throughout this article, we thoroughly scrutinize the activity of the following organizations: 1) Co Ltd "Civil Technologies of Defense Industry Complex" (the Fund of *Civil Technologies of DIC*); 2) the non-profit organization "The Fund of Modernization and Technology Development" (the Fund of *modernization and technology development*); 3) the federal public autonomous institution "Russian Fund for Technological Development" (the Fund *for industry development*); 4) the fund of support of scientific, scientific and technical, innovative activity "Energy without borders" (the Fund of *Energy without Borders*).

DISCUSSION

The Fund of Civil Technologies of DIC

The fund was created on February 21, 2013 within the realization of the strategy of Russian Venture Company (Co Ltd RVC) and the policy of the open joint stock company "Ramenskoye Instrument-making Design Office" (Co Ltd RIDO). The fund is the investment

tool of the exit of technologies and the DIC projects on the Russian mass market and the international market. The fund pursues the following main *objectives*:

- active involvement into effective commercial activity of perspective civil technologies of the competitive Russian companies including the work in DIC sector and also ensuring market profitability on the invested capital in the innovative companies, which business is based on the commercialization of civil technologies;
- stimulation of the development of investments into the companies in Russia which are at a growing stage of business development and which activity corresponds to the list of advanced technologies in the Russian Federation, the work in the sphere of instrument making, the creation of new materials and built-in systems (intellectual systems and control systems);
- acquisition, creation, production and promotion of the commercial version of innovative production/service in the field of built-in systems, new materials, in the instrument making development;
- acceleration of the implementation of investment projects, in which there is an interest of the acting participants of the market.

The investment policy of the fund is based on receiving a profit from money investment into securities and shares in authorized capitals of the Russian economic societies, which are the innovative companies the with orientation to the sphere of instrument making, creation of built-in systems and new materials.

The strategy of the fund includes the involvement of new participants in the sequel – the profile industrial and financial investors possessing experiment on the development and commercialization of civil technologies used for the creation of new materials and built-in systems (intellectual systems and control systems); the formation on the basis of the fund management company, which specializes in the management of funds and technological investments including in the field of civil technologies of DIC.

Conditions for fund investments into the innovative company correspond to the following main *criteria*: 1) technological decisions, used for the creation of objects of investments, must have a high potential of protection, the field of the protected results of intellectual activities, the possibility of commercialization of objects of investments in global markets; 2) the company has a right to the protected results of intellectual activities in the volume which is necessary and sufficient for legal application of the technology approved in the investment project at the realization of a product in the Russian Federation and other states; 3) property rights, the property of innovative companies, etc.

Investment activity of the fund is concentrated on the maximizing of company increases in the cost of portfolio companies. The fund realizes programs minimum risk thresholds for data that means the investment into innovative companies by means of the implementation of procedures of checks provided by internal documents of the fund. Within the functioning a number of projects were supported by the fund (see *table 1*).

The Practice of the functioning of companies supported by the fund given in the *table 1* includes the following activity:

1). Ltd "Kolibri". The year of inclusion into a portfolio: 2014. Investment status of the project: sowing and initial. Direction of modernization: strategic computer technologies and software; development, test and certification of an onboard complex of information support; intellectual support and safety of flights of KBO MA for easy regional aircraft.

2). Ltd "Makstelkom". The year of inclusion into a portfolio: 2013. Investment status of the project: sowing and initial. Direction of modernization: space and telecommunications; processing equipment for the installation of quartz optical fibers.

3). Ltd "Reyser". The year of inclusion in a portfolio: 2014. Investment status of the project: sowing and initial. Direction of modernization: development of a modern highly reliable operating system of real time for application as a part of perspective complexes of onboard equipment.

4) Ltd "Reyser". The year of inclusion into a portfolio: 2014. Investment status of the project: early stage. Economy sector: electronics. Direction of modernization: the development and release of the first-ever inexpensive hybrid media player working with the HEVC (H.265) codec on the market.

5). Ltd "Transkoder". The year of inclusion into a portfolio: 2013. Investment status of the project: sowing and initial. Direction of modernization: space and telecommunications; video-transcoder with a possibility of "cloudy acceleration".

The Fund of Modernization and Technology Development

The fund of modernization and technology development (further – FMTD) *the Fund of Modernization and Technology Development* – is a non-government investment fund, financial institutional tool to facilitate investment development, mechanism of organizational and financial support provided to scientific research and technology. The fund was incorporated in November 2011 by the non-profit organization "Euro-Asian Center of Economic and Legal Cooperation", non-profit organization "National Innovation and Technology Chamber", OJSC "Agency of Innovative Project Development". *Fund's mission* is aimed at the implementation and commercialization of results of research activities, research and technology development, inventions and improvements in priority trends of innovative development. *Fund's strategy* consists of attracting investment funds of legal entities and individuals, budgetary funds to implement the Fund's programs and projects in the field to finance other programs, projects, and events aimed at the development of innovative activities and production of competitive, in-demand, socially important products based on advanced technology. *Fund's investment strategy* consists of investing in the shares and stakes of Russian companies at the pre-seed and seed stages, as well as the companies that already went through R&D stages, but have not yet come to the level of the scale of the project.

The main areas of cooperation and partnership are as follows:

- Integration and consolidation of efforts in establishing mechanisms of investment funds accumulation and project financing;
- Attraction of private investments into innovative projects proposed by partners, assistance in the implementation of mechanisms of integrated financing of innovative projects proposed by partners;
- Joint evaluation of the demand rate with regard to funds and other resources necessary for innovative development;
- Search and presentation for implementation of innovative projects, development of unified approaches to selection, assessment, structuring of transactions and implementation of projects;
- Expert and consulting support of projects, design and manufacturing of innovative development, project and production support;

The fund's management body – is the board of the fund. The board consists of founders of FMTD or their authorized representatives. The control over activity of certain divisions of FMTD or of the implementation of projects can be charged with each of the board members. During the creation of FMTD the Board of trustees has been created to ensure successful activity which is created by general meeting of founders of FMTD. The board of trustees of FMTD defines the directions of the concentration of the main efforts in activity of the fund, renders assistance in the solution of complex challenges and exercises supervision of achievement of stated purposes.

The fund within operating activities uses three key schemes of financing, namely – granting grants and subsidies, entry into the capital. It should be noted that the main directions of research activity of fund provided by Grant policy include "*energy efficiency and energy saving*", "*space technologies*", "*biotechnologies and pharmaceutics*", "*nuclear technologies*", "*computer technologies*". The fund carries out financing of innovative projects in the form of granting a gratuitous and irrevocable grant of the innovative company.

FMTD finances the projects directed to the implementation of research, developments and commercialization of their results; allocates subsidizing for a transition of the project from one stage to another one; allocates funds for purchase of the expensive laboratory and (or) production equipment, mainly within the creation of different centers of collective use; carries out the check of production results on the basis of the criteria specified in the grant agreement; considers reports on the results of the project completion and involves external experts and auditors to the confirmation of relevance, competitiveness of the project, the assessment of its intermediate results, the confirmation of target usage of means (Skolkovo Foundation, 2016).

One more instrument of support realized by FMTD is an entry into the capital of companies which is regulated by the investment declaration (Memorandum). The major goal of the investment policy of FMTD is to obtain investment income, for the purpose of their further use for the achievement of objectives and the mission of FMTD. The investment strategy of FMTD is the investment of funds of FMTD in securities and shares in authorized capitals of the Russian economic societies, or in authorized capitals of newly created economic societies with the participation of FMTD. The investing into Investment projects can be carried out by tranches. Investment decisions of FMTD are made, proceeding from criterion of an optimum ratio "risk/profitability". The control of investment activity of FMTD is exercised by the Board.

Financial support in a type of subsidies is carried out on a competitive basis within the realization of the mission of the fund. Subjects of innovative activity are subject to financial support; the project of which provides commercialization of scientific and technical developments.

For example, the fund supported a number of key projects within the functioning of Ltd "Scientific Center of an Experimental Mycology", with the result that:
- the collection of strains with the proved biological activity is created;
- research-and-development activities (R&D) and development work (DW) with conclusions on a therapeutic activity of some substances are carried out;
- substances on biological safety and one of the substances of the laboratory in the field of oncology are investigated.

With the participation of FMTD means the technology of receiving an active agent has been completely fulfilled; preclinical research on specific activity in one of the main scopes has been conducted; the patent for the invention has been taken out. Possible scopes include autoimmune diseases, cardiovascular diseases, sepsis.

By the results of the analysis of organizational documents and the used schemes of financing, and also on the basis of the results of the fund functioning, a number *of advantages* of FMTD are revealed: the directions of basic research are preemptive for the world fundamental science; the fund possesses a set of necessary tools on support of the development, registration and a conclusion special products to the market; broad applied cooperation of science, industry and investments is possible.

The Fund for Industry Development

It was formed in 2014 for the purpose of updating industry, ensuring import substitution, and the formation of new products. The initiator of the fund is Minpromtorg of the Russian Federation by means of the reorganization of the Russian fund of technological development. The fund provides preferential terms of joint financing of projects which are focused on the creation of new hi-tech production, increase of technical and economic level of separate productions on the basis of the introduction of advanced technologies.

The fund carries out the activity at the expense of means of a subsidy, the grounds for which are the agreement on granting a subsidy, concluded between the fund and the Ministry of Industry and Trade of the Russian Federation. The organization realizes support of the following projects: projects of import substitution; pre-banking projects; pre-investment projects; projects of consortia and engineering.

For the implementation of innovative industrial and technological research the fund allocates target loans on a competitive foundation that forms the basis for a stimulation of receipt of direct capital investments in the real sector of economy. The loans granted by the fund are provided with different types of ensuring, at the same time the major of them are pledge of property, property rights; pledge of securities; sponsorship; guarantee.

Borrowing costs can be used in the following purposes:
- carrying out of DW, skilled and technological work (STW);
- development of the feasibility study;
- acquisition of the rights for the results of intellectual activity;
- engineering services;
- acquisition of equipment.

After the decision on the adoption of an application and the direction it for a complex examination the project manager organizes complex examination of the project in the following directions:
- scientific and technical examination (*the purpose* an assessment of scientific and technical level of the offered development, compliances to the principles of the best available technologies, approachability of scientific and technical parameters, compliances of expenses and terms of development to market conditions);
- production and technological examination (*the purpose* an assessment of material and technical resources, which supposes the realization of DW and the project in general, an assessment of a control system of realization of DW and the project);
- financial and economic examination (*the purpose* – the confirmation of the compliance of the project to conditions of the chosen program, and also the compliance of expenses from means of a loan);

- legal examination (*the purpose* – an assessment of powers of the parties to commission of estimated transactions, an assessment of legal risks of the project and participation in its realization of the fund).

As a result of the carrying out of all directions of complex examination of the project, a project manager submits the plan for consideration of Advisory council. For the scrutiny on Advisory council the project manager prepares the presentation on the project containing the main information on the project reflecting its scientific and technical, production and technological component and economic efficiency. The advisory council makes the decision on approval of granting financial security for the implementation of the project, a rejection of an application for financial security or on an adjournment of decision-making on the project before obtaining additional information/elimination of the revealed shortcomings.

Within the period of the functioning a number of projects are submitted by the fund, a list of which is presented by 56 organizations (applicants). It is possible to distinguish:

- CJSC "ACOM" (Zhigulyovsk). The Name of the project: the development and production of innovative rechargeable batteries;
- CJSC METAKLEY (Karachev). The Name of the project: new insulating material which allows to run pipelines quicker and more qualitatively;
- JSC "NPK Uralvagonzavod" (Nizhny Tagil). The Name of the project: safe tanks from polymeric materials for transportation aggressive chemicals;
- Ltd "Voronezhselmash" (Voronezh). The Name of the project: the latest Russian equipment for processing of seeds;
- CJSC "ROTEC" (Yekaterinburg). The Name of the project: the development of technology and the creation of components of power gas turbines of domestic production, etc.

The Fund "Energy without Borders"

This fund is engaged in the support of SSTIA in the field of energy efficiency and power plant engineering. The fund is founded by a joint-stock company "INTER RAO Capital", which enters into a group of "Inter RAO" companies. The fund is the non-profit organization which does not have any membership and it is founded on the basis of a voluntary property contribution, pursuing exclusively scientific, social, cultural, educational and other socially useful purposes.

The fund defined four portfolio *directions* according to which financing of the following projects are carried out:

- the introduction of the progressive power techniques causing scientific and technological progress in branch at the present stage;
- the strengthening of indicators of power efficiency, environmental friendliness, reliability and safety;
- the increase of economic efficiency, contribution to the growth and development of the company;
- the creation, accumulation and the use of "know-how", maintenance of a reputation of the company.

The target program of the fund includes four subprogrammes solving the following problems:

- the perspective development of Inter RAO Group by assistance to the development of advanced technologies and the equipment (the research and development program "Scientific and technological leadership");
- the ensuring of current requirements for Inter RAO Group by the improvement of operative equipment (the program of scientific research, developmental, skilled and technological work and innovative activity of RAO "Inter RAO");
- the cooperation with Skolkovo Foundation (Skolkovo Program);
- the development and the implementation of joint projects on the principles of joint financing with other participants (the research and development program "Power partnership").

By means of the fund such industry companies as JSC "Inter RAO" realized the instrument of consolidation of resources for the purpose of the solution of problems of economy modernization in the field of innovative development of electrical power branch. The unification of financial resources in the fund created the main prerequisites for advantages concerning financing of scientific research.

Today there are more than 50 projects in a portfolio of the fund available in such innovative directions of the target program of the fund as: the creation of progressive power technologies; the increase in reliability and power efficiency of the equipment, improvement of its ecological characteristics; the development of marketing and organizational innovations; the creation and improvement of infrastructure.

The implementation process of the fund target program includes three stages of examination: 1. The examination of applications for research and development performance; 2. The examination of the specification on research and development performance; 3. The examination of results of work.

As a result of the implementation of the target program of the fund more than 40 *results* of intellectual activity are created, from which it is possible to distinguish: the invention of a multilayered heat-shielding covering, the composition of additive material, a shovel of steam turbine, an element of the stator of power turbine, an optical element, etc.

The fund developed offers on a change of qualifiers where within energy saving and increase of power efficiency, and also for the purpose of the development of import substitution and support of export in the Russian Federation, it is offered to consider types of production and kinds of activity on the basis of innovative technologies and new materials.

The fund conducts active work on creation of a strategic partnership on the interaction with institutes of the development for association of efforts in the implementation of projects in the sphere of the creation of advanced scientific developments in the field of power industry, the formation of unique scientific and engineering competences, commercialization of technologies and support of small innovative companies (spin-offs) ("Inter RAOYEES, 2016).

It should be noted that and the Agreement on strategic partnership with the Federal state autonomous organization "Russian Fund of Technological Development" has been concluded and successfully realized (FSAO "RFTD", since 07.05.2013). The staff of the fund comprise the participants of scientific coordination council of the Federal Target Program (FTP) "Research and developments in the major directions of development of a scientific and technological complex in Russia". Contacts with various venture funds, including foreign (for example, with Leveraged Green Energy) concerning the attraction of financing in innovative projects are constantly carried out.

CONCLUSIONS

More detailed consideration of each of above-mentioned funds, *first,* allows conducting a comparative analysis of the existing practice of creation and functioning of SSTIA funds:

1. It is revealed that the scheme of management of funds is similar; the available distinctions are defined by an organizational form and structure of founders; however the fund of "Civil technologies of DIC" has no specialized expert body which functions are partially assigned to an investment committee of fund, and realized by the management company.

2. It is established that the priority directions of projects in an explicit form are only defined by the fund of "Modernization and technology Development" and the fund of "Energy without borders". The accounting of specific requirements to subjects of projects within the development of a branch is the priority direction of a support as it reflects requirements of this or that branch of industry.

3. Specific restrictions, applying for the companies' support, are set by the fund of "Civil technologies of DIC".

4. The fund for industry development possesses a specific structure of documents. The operating activities are regulated by a number of detailed standards based on process-based management. This approach seems perspective and replies to modern methods of management organization.

5. As the analysis shows, the fund of "Energy without borders" has no expert body which is engaged in the selection of projects and it attracts an external organization which considers information on the requirement of the performance of R&D research.

Secondly, carrying out the analysis of practice of creation and functioning of SSTIA funds gives a chance to define the principles, on the basis of which an organizational scheme of any fund od such type is to be built:

- target orientation – priorities of fund tasks on the basis of the complex analysis of scientific and technical challenges, the company faces;

- sequence, argumentativeness and legal security of the mechanisms used;

- a large number of attracted financing sources;

- the ability to adapt successfully to the changing environmental conditions for the maintenance of the largest productivity.

At the same time, by the results of the research a number of existing *problems* in the realization of activity of non-state funds have been revealed. The main question on the development of the system of support of SSTIA is backwardness of legislative base. Another problem is the rights for the results of developments which in various options can belong both to non-state funds of SSTIA, and the scientific organization. It is also necessary to note that in 2015 there happened a number of system changes in legislative aspect of mechanisms of the creation of non-state funds of SSTIA. Particularly essential changes were made to the Law on science (The Federal law of July 13, 2015 No. 270-FZ "About modification of the Federal law "About science and state scientific and technical policy" regarding the improvement of financial instruments and mechanisms of support of SSTIA in the Russian Federation" (CJSC Konsultantplus, 2016). These changes became the reason for the exception from a possibility of formation of resource base of SSTIA funds. In most cases it caused "freezing" of the activity of created funds, and in certain cases their closing.

SUMMARY

On the basis of the analysis of legislative, organizational and financial aspects of creation and functioning of non-state funds we investigated a number of problems which, in our opinion, demand the application of concrete measures according to the following *recommendations* at the present stage. For the solution of the existing problems it is necessary to establish the following fundamental measures:

- to create supervising bodies of non-state funds at the state level;
- to prepare methodical recommendations about the creation of corporate non-state funds;
- to stimulate the creation of the joint funds which carry out projects of branch (interindustry) value;
- to make changes to the legislation concerning the regulation of the activity of funds that assumes a possibility to choose a legal form, comfortable for the activity of funds, and the establishment of general model of their functioning, including control over an expenditure of money;
- to create the mechanism of the expansion of opportunities of funds to attract the financial support for scientific, scientific and technical, innovative activity from the companies with state participation, and also the organizations without state participation;
- to establish the system of indicators and indicators to assess the effectiveness of support of funds of each kind of activity taking into account its specifics;
- to consider the economic effect quantitatively gained as a result of a successful implementation of the project and its introduction into industrial production or economic turnover of the organizations in the real sector economy;
- to transfer the functions of management for DW to the funds capable to select scientific organizations or collectives holding leading positions in the area of research and development.

It is necessary to emphasize that the financial security of scientific and innovative activity remains to be a weak link of the operating economic mechanism. Such type of tax benefits as transferring of the preferential mode of the taxation for future periods can be one of the possible methods of stimulation to contribute to SSTIA non-state funds. Simple decrease in a rate on profit for donors in SSTIA non-state funds can become an additional method of stimulation.

The perspective model of the creation of a fund of support of scientific, scientific and technical, innovative activity as a part of a group of companies or a holding makes it captive. The creation of such fund allows the companies to reduce general tax burden due to the reference of contributions to the fund of support of SSTIA in the corresponding tax periods. Another perspective model of the fund formation is the creation of an organizations supported by federal executive authorities and state corporations which also realize various programs including target projects. Filling of such funds by donors' means can be solved in a directive way: in one case by an inclusion of requirements to the obligatory assignment of means in funds for participation in certain procurement procedures, and in the other the target instruction for subordinated organizations.

Thus, the conducted research of functioning of the SSTIA non-state funds, and also the comparative analysis of their main activities confirm the thought that in the system of institutions urged to support scientific and innovative activity, *funds* possess an exclusive role. The major privileges of financial instrument of scientific and technical, innovative activity by means of funds include: 1) an opportunity to provide a qualified consideration both at a stage of selection of applications for financing, and in the analysis of the received indicators and results; 2) an

opportunity for individual faces and on-stage performance groups to get financial support for initiative projects which can experience difficulties in search of financial aid; 3) the possibility of public-private partnership mechanisms in the field of scientific and technical innovations.

The measures for the improvement of funds of support of SSTIA described in the article allow us to approach objectively and differentially to the solution to the problems on the promoting a system of funds of support of scientific, scientific and technical, innovative activity. It will give a chance to provide the growth of innovation activity in the Russian Federation.

Table 1
PRACTICE OF THE FUND FUNCTIONING OF "CIVIL TECHNOLOGIES OF DIC"

№	Name of the portfolio company	Economy sector	City
1	Ltd "Kolibri"	Information technologies, Internet technologies and services	Ramenskoye
2	Ltd "Makstelkom"	Telecommunications	Moscow
3	Ltd "OS RV 653"	Information technologies, Internet technologies and services	Ramenskoye
4	Ltd "Reyser"	Electronics	Saratov
5	Ltd "Transkoder"	Telecommunications	Saratov

CONFLICT OF INTEREST

Authors confirm that the submitted data don't contain the conflict of interests.

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ECONOMIC CRIMES RELATED TO OIL PRODUCTION, TRANSPORT AND REFINING

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ABSTRACT

In article crimes in the sphere of economic activity for which object are the public relations in the sphere of production, transportations and oil refining are analyzed. Some features of economic crime in the oil sphere are revealed, and also the offers directed on fight against economic crimes related to oil production, transport and refining become. Illegal business takes place in case of implementation of business activity in the sphere of production, transportation and oil refining without registration or without license on condition of commercialization in a large size or causing large damage. One of the distinctive features of the crimes related to oil production, transportation and refining is that these are criminally organised. The desire of excess profit forces the oil market players to combine their efforts and organise criminal groups and conspiracies. These criminal groups may include state authority. Fight against economic crimes related to oil production, transport and refining demands creation of a complex legal, including addition of the criminal legislation with special corpus delicti, which subject are the oil and oil products which aren't conforming to the established requirements, and organizational measures.

Keywords: economic crimes related to oil production, transport and refining, crimes in the sphere of economic activity, organized crime related to oil production, transport and refining.

INTRODUCTION

The energy industry is one of the key sectors of the Russian economy, which best performance may contribute to many trades. The oil and oil products turnover is strategically significant for our country (Safiullin et al., 2013). Performance of defence, sustainment and socially significant facilities is associated with handling the above resources, which ensures maintenance of national sovereignty, territorial integrity and energy security. The Russian Federation National Security Strategy until 2020 approved by the Decree of the President of Russia No. 537 dated 12 May 2009 says: for national security protection, the competitive trades develop in the medium term as well as the energy industry enhances its efficiency. The prices for oil products, their quality, production output and delivery, sales conditions immediately affect not only the national interests but also each individual (Valitov et al., 2012). The oil became the basis of the economy in the early 1970's when giant fields of Western Siberia had been brought into production. 10 years later, in 1980-1981, the first time the oil and gas proceeds reached their peak (although it was not the actual peak but estimated in the alternative world prices): the oil and gas were sold for 400 billion USD. The boom of oil and gas proceeds resumed at the turn of

XXIth century peaking in 2008 at approximately 650 billion USD. In 2010, this figure was 500 billion USD (Clefford et al., 2011).

MATERIALS AND METHODS

International legal acts, the Constitution of the Russian Federation, the Criminal code of the Russian Federation have acted as a basis of a research. Historical and legal, formal and logical, system and structural, concrete and sociological and statistical methods, a method of comparative jurisprudence were applied.

RESULTS

Despite its incontrovertible importance for the Russian economy and the tighten control from the government, unfortunately, the energy sector failed to evade criminalisation. Yu. V. Latov says that "the Russian oil and gas sector ensures high revenue, however it also appears that high dangers and risks for economic security of Russia relate to it" (Latov, 2009). According to RF Ministry of Internal Affairs, the energy industry heads the list of Russian sectors in terms of damage by economic perpetration.

The Criminal Code of the Russian Federation is effective on January 1, 1997 as revised to first include the Chapter "Economic Crimes". The economic crimes include a wide range of illegal acts so that the public relations in the economic field being targets of this crime varied in form. Among others are public relations in oil production, transportation and refining.

The criminal encroachment, which may target the oil production, transportation and refining, are, for example, theft from oil, oil products and gas lines (Clause "b", Part 3, Article 158), entrepreneurial business fraud (Article 159[4]); impeding legal entrepreneurial or other activity (Article 169); illegal enterprise (Article 171); legalisation (laundering) of monetary means or other assets purchased by others through crime and by a person through commission of a crime (Articles 174 and 174[1]); purchase or sale of assets knowingly procured through crime in terms of oil and oil products (Clause "b", Part 2, Article 175); delinquency in payment of customs duties payable by a company or an individual (Article 194); bankruptcy misconduct (Article 195); premeditated bankruptcy (Article 196); fictitious bankruptcy (Article 197); evasion of taxes and/or dues by a company (Article 199); breach of tax agent's duties (Article 199[1]); concealment of monetary resources or assets of a company or an individual entrepreneur, based on which the taxes and/or dues are to be collected (Article 199[2]); damaging the oil, oil products and gas lines (Article 215[3]); subversive action (Article 281); fabrication, sale of counterfeit excise stamps, special conformance stamps or marks or their use (Article 327[1]).

To pursuit activities of oil production, transportation and refining, a legal entity should underwent the registration procedure as prescribed by the law (Clause 1, Article 2 of the RF Civil Code). The procedure of state registration is defined by the Federal Law No. 129-FZ "Concerning the State Registration of Legal Entities and Private Entrepreneurs" effective on 8 August 2001. Pursuant to the RF Law No. 2395-1 "Concerning Subsurface Resources" effective on 21 February 1992, making the subsurface resources available for use, including without limitation to exploration and production of resources is subject to a special licensing (Articles 6, 11). Therefore, if the activity related to oil production, transportation and refining is undertaken but not registered or licensed, the persons, who so perform, should be held criminally liable for illegal enterprise under Article 171 of the RF Criminal Code in case of high income or heavy

damages incurred by individuals, companies or state (an amount in excess of 1.5 million Rubles). Illicit oil refining at 'mini-factories' refers to illegal enterprise. Usually, the 'mini-factories' are illicit artisan undertakings or 'clandestine' workshops for manufacture of fuels and lubes through crude oil refining. It is common practice for such facilities to receive oil, which was illegitimately produced or stolen to process in improvised refinery systems (Selivanovskaya et al., 2012). Considering low output of these improvised systems, the oil taken from different tap-in locations is usually refined in several mini-plants. The resulting gasoline and motor oils are of low quality; however, they are being well sold all over Russia. This kind of crime implies avoidance of state registration and control (acquisition of licenses, adherence to their terms and conditions, violation of tax and cash compliance etc.).

In addition, if the legitimate oil-related activities are impeded through, for instance, refusal of registration of a company that produces, transfers and processes the oil; avoidance of registration; refusal or avoidance to issue a license, the official of the Federal Tax Service or the Federal Agency on Mineral Resources (Rosnedra) shall be held criminally liable under the Article 169 of the RF Criminal Code.

Another crime targeting the oil-related interests is procurement or marketing of the assets knowingly obtained by illegal means. The previously unpledged procurement or marketing of assets knowingly obtained by illegal means, including oil and oil products, is criminally liable. The primary crime resulting in production of oil or oil products is mostly the theft. The dangerous criminal tendency of the recent years includes stable growth in theft of oil and oil products through illegal tapping in oil and oil products lines. Over a period of years, this kind of stealing has developed to a massive security hazard to the energy industry previously being one of the rare crimes. Profit from theft through tapping and other stealing of oil and oil products will be further legalised (laundered), which creates criminal liability under the Articles 174 and 1741 of the RF Criminal Code.

Criminal bankruptcies are another group of crimes related to oil production, transportation and refining. There are three types of criminal bankruptcy: 1) bankruptcy misconduct (Article 195, RF Criminal Code); 2) premeditated bankruptcy (Article 196, RF Criminal Code); 3) fictitious bankruptcy (Article 197, RF Criminal Code). The Federal Law "Concerning the Insolvency (Bankruptcy)" effective on 26 October 2002 sets the grounds to recognize the debtor insolvent (bankrupt); regulate the procedure and provisions for taking measures against insolvency (bankruptcy); procedure and provisions of matter of bankruptcy, including strategic industrial facilities (§54, Chapter IX of the Law). The Decree of the President of the Russian Federation, No. 1009 dated 4 August 2004 "Concerning the approval of a list of strategic industrial facilities and joint-stock companies" refers Transneft, a joint-stock oil delivery company, Moscow, Zarubezhneft, Moscow, Rosneft Oil Company, Moscow, Rosneftegas, Moscow to the strategic industrial assets. If the bankruptcy proceedings of the companies that produce, transfer and process the oil, including strategic industrial facilities, is violated and in case of causing heavy damages, the guilty parties will be held criminally liable under Articles 195-197 of the RF Criminal Code.

The last group of crimes related to oil production, transportation and refining consists of tax crime (Articles 199, 199[1], 199[2], RF Criminal Code). Pursuant to Article 19 of the RF Tax Code, the oil production, refining and transportation companies are the tax payers that are obliged to pay taxes and duties. The companies that produce, transfer and process the oil shall pay federal, regional and local taxes. The federal taxes are: corporate income tax, value-added tax, excise taxes, personal income tax (these companies function as personal income tax agents).

The regional taxes are: corporate property tax, transport tax. The local taxes include land tax. In addition, the oil production companies are payers of mineral extraction tax (Khafizova and Fassakhov, 2015).

If a company, which produces, transfers and refines the oil, avoids paying taxes, the manager and/or chief accountant may be held criminally liable provided that such avoidance was on a massive scale. Likewise is the matter with failure to perform duties of a tax agent by such companies to pay personal income tax. If a company, which produces, transfers and refines the oil, avoids paying taxes and hides the funds or assets that should be used for recovery of arrears of taxes and/or dues, the manager and/or chief accountant may be also held criminally liable provided that the funds or other assets were hidden on a massive scale.

There are different tax avoidance schemes: sale of final products disguised as semi-finished products (pipeline oil as the borehole fluid); employment of shell companies and in-house (transfer) prices by vertically integrated companies for minimising the taxes. In addition to the above means, R.R. Alaberdeyev specifies the others: subsurface use with violation of license agreements consisting of above-limit oil production; underestimation of tax base when flowing the wells that are officially at the stage of construction; lease of oil refining facilities as an entire production complex to other companies, in which the oil and gas company itself is a shareholder; inappropriate allocation of property tax privileges (Alaberdeev, 2011). We believe that the avoidance to pay taxes may also include tax-free barter and setoff operations; increase in oil refining costs; non-available or incorrect accounting etc.

Avoidance to pay customs charges payable by a company or an individual (Article 194, RF Criminal Code) is intrinsically similar to the avoidance to pay taxes as both hurt the financial capability of the country. The most popular mean to avoid customs payments is unreliable information of customs value, the number, scope of goods and other data so mentioned in the customs declaration and other related documents that to understate the customs payments. The most popular method to avoid customs payments in the petroleum industry is oil export disguised as oil products. The difference in customs payments may reach up to 200 US Dollars per 1 ton of exported products. It makes sense to fight against such avoidance and we believe that it is a good practice to agree with the considerations to improve the legal system of Kazakhstan as proposed by Zhanat Elimanov, Head of Department for Economic and Finance-Related Crime Clearance, the Republic of Kazakhstan Agency for Economic and Corruption-Related Crime Control (Berdieva, 2013). Therefore, the hydrocarbon export rates of duty may be so equalised that the export of oil under the guise of oil products will be senseless. Moreover, the customs authority should tighten control of exporting oil and oil products through, for instance, exporters' documents that can verify the legitimate source of origin of oil and oil products being exported.

Currently, the criminal laws of the Russian Federation are free of special components of economic crime merely in terms of oil or oil products. The criminal laws of some countries stipulate such crime (Opsal and Shelley, 2014). Thus, transportation, procurement, marketing and storage of oil and oil products as well as oil refining are held liable if their origin is not confirmed through respective documents (Article 183-1, Criminal Code of the Republic of Kazakhstan). There are proposals in Russia to determine specific criminal liability for oil crimes, e.g. to add Article 171[2] "Production, procurement, storage for purposes of selling or sale of oil products that do not meet the requirements" to the RF Criminal Code (Solovev, 2007). It should be noted that specific components of crime are provided in the Russian criminal laws. In July 2014, the RF Criminal Code was added with the Article 191[1] "Procurement, storage, transportation, processing for purposes of selling or sale of known illegally converted wood.

One of the distinctive features of the crimes related to oil production, transportation and refining is that these are criminally organised. The petroleum business is one of the most inviting fields for individual criminals, specifically, for organised criminal groups. Usually, the oil-related crimes by organised groups are continuous with multiple episodes. The oil sector is the scope of large business. The desire of excess profit forces the oil market players to combine their efforts and organise criminal groups and conspiracies. The observance says that it is characteristic of organised crime to establish corruptive connections between the criminal organisations and officials of administrative and law enforcement bodies. The expert forecasts suggest that the total growth in the number of crimes related to oil production, transportation and refining would be accompanied by their increased social danger due to organised perpetration, expanded corrupt practices of each and all links of the state machine and further collaboration with criminality.

SUMMARY

1.   Economic crimes target public relations related to oil production, transportation and refining.

2.   Illegal enterprise occurs if the activity related to oil production, transportation and refinery is undertaken being not registered or licensed providing high income or heavy damages. Usually, small artisan oil refineries undertake to engage in this kind of crimes.

3.   Prevention to legal undertaking consists in refusal to register on the part of officials of the Federal Tax Service of Russia or refusal by Rosnedra officials to issue license.

4.   Returns on mineral extraction tax in terms of oil production versus other minerals exceed 70%. Avoidance of a company to pay taxes and/or dues is highly dangerous for the society. The most popular avoidance to pay taxes is: marketing of final products as semi-finished products, transfer pricing, breach of license agreements, understatement of taxation bases, increase in costs for oil processing, missing or unreliable accounting. The most popular method to avoid customs payments is oil export disguised as oil products.

5.   One of the distinctive features of the crimes related to oil production, transportation and refining is that these are criminally organised. The desire of excess profit forces the oil market players to combine their efforts and organise criminal groups and conspiracies. These criminal groups may include state authority and local government officials.

6.   Struggle with economic crimes related to oil production, transportation and refinery requires a policy, including amendment of the Russian laws so that to add components of crime in terms of inadequate oil and oil products, and organizational measures to prevent crimes and improve legal culture.

CONCLUSION

The existing criminogenic oil-related situation is, therefore, a game changing point on the agenda. The Russian Federation becomes increasingly excited to draw up a package of measures to counter and prevent economic crimes related to oil production, transportation and refining. Such measures should include criminologic and legal means of governmental control of oil and oil products turnover as well as regulation of such control. Legal and organisational prevention of perpetrating oil-related crimes, improvement of legal culture for the impatience with crime commission will facilitate the successful fighting the economic crimes related to oil production, transportation and refining.

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RISK MANAGEMENT ASSESSMENT: RECOMMENDATIONS FOR RUSSIAN FEDERATION

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ABSTRACT

Risk management, the use of risk management technologies and risk management culture development is an important aspect for sustainable development provision at the present stage. The relevance of the scientific article subject is the relative uncertainty of market relations development at the present stage of economy development, the factors that have a crucial importance on the efficiency of risk management during the performance of risk management policy by a state.

During the study of risk management effectiveness and the impact of various factors on it the econometric and economic-mathematical methods of research were applied, the implementation of which is carried out using the software package Gretl for econometric studies.

The obtained study results suggest that the risk management effectiveness is influenced by the following factors at a state level: the availability of existing ISO standards under development for risk management, adopted as national ones; the existence of other documents for the national or regional risk management; the training of risk management experts in educational institutions; the country participation in ISO/TC 262 committee according to risk management standards; the participation of the country in UN working group WP.6 concerning risk management standards in standard regulation systems.

According to the obtained results the authors of the study concluded that the reasons of risk management system reformation at state and business levels should be integrated and involve the exchange of knowledge and experiences between different spheres of risk management manifestation.

Keyword*s: risk management, risk control, econometric methods, econometric model of risk management, risk management effectiveness, risk management factor effectiveness.*

INTRODUCTION

The modern problems of risk management in Russia are discussed actively in Russian science within the modern world-class level of technologies from the early twenty-first century. According to the results of various recent Russian and international studies (Belousova, 2010; Grishin,2016;http://www.kpmg.ru/russian/aci/_docs/survey_results.pdf; http://www.marsh.com.ru/RU/services/mrc/documents/mrc_briefing_issledovaniya.pdf)   more than 30% of the respondents believe that he lack of national standards for risk management and the lack of risk-management certification programs according to national standards and state standards at higher education institutions of risk management one of the urgent problems concerning the level of growth and the quality of risk management (Belousova, 2013).

The aim of the study is the determination of relations between the factors that influence the level of state risk management, as well as the determination of recommendations on this basis in order to improve the organization and the efficiency of risk management in Russian Federation.

The expert estimates of 12 risk management factors and the level of risk management development according to 14 countries data with the application of economic, mathematical and econometric methods were used for the study.

METHODS

In order to describe the model of risk management development at a state level and the impact of various factors on it it is advisable to use the econometric methods of spatial data modeling. The simulation will be performed using the software for econometric studies Gretl.

Expert estimates will be used as the data for the econometric modeling of spatial data. Expert estimates were obtained through questionnaires according to the indicators that influence the level of risk management at a state level. Also the experts were asked to evaluate the effectiveness of risk management development at a state level. Indicator data, as well as the development of risk management at a state level are presented in Table 1.

Table 1
THE FACTORS WHICH INFLUENCE THE LEVEL OF RISK MANAGEMENT IN 14 COUNTRIES

N	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12
1	89	29	121	6	4	11	12	174	2	2	0	1	3
2	20	6	16	6	2	3	6	20	2	2	0	1	0
3	68	31	73	6	4	1	3	2	2	2	4	2	0
4	27	13	39	4	1	1	3	0	1	0	0	0	1
5	38	22	41	4	1	1	1	0	2	2	0	0	0
6	22	12	31	4	1	0	1	0	2	2	0	1	0
7	29	6	45	4	1	0	1	1	2	2	4	0	0
8	19	5	6	6	2	1	1	2	2	0	0	0	1
9	17	7	16	2	1	1	1	1	2	0	0	0	0
10	13	4	10	2	0	1	1	1	2	0	0	0	0
11	15	8	38	4	2	3	3	2	0	2	0	0	0
12	5	1	4	6	2	2	6	0	0	0	0	0	0
	7	8	3	4	2	1	1	0	0	0	4	0	1
	18	3	36	6	1	1	1	2	2	2	4	0	1

The following notations were introduced for the purposes of econometric studies:

Y - the level of risk management development for 14 countries within 100-point scale;

X_1 - the availability of existing and developed ISO standards for risk management, adopted as national ones;

X_2 - the presence of other existing national or regional documents;

X_3 - the training of experts at educational institutions;

X_4 - the presence of existing national organizations and associations for risk managers;

X_5 - the presence of existing GARP representatives in a country or a region;

X_6 - the presence of existing PRIMA representative in a country or a region;

X_7 - the presence of existing representatives of other international organizations and associations (SRA, RIMS, RMA);

X_8 - the participation of a country in ISO/TC 262 committee concerning risk management standards;

X_9 - the participation of a country in the UN working group WP.6 concerning risk management standards within standard regulation systems;

X_{10} - the availability of existing national or regional initiatives, legislation acts, support programs for risk management at small and medium enterprises;

X_{11} - the availability of relevant databases for operational risks;

X_{12} - the availability of relevant data bases for emergencies.

During the evaluation of the model factors and their effect on a dependent factor (the efficiency of risk management) the least squares method is used. It minimizes the amount of square deviations between observed and calculated values. The calculated values are obtained according to a selected regression equation. The least squares method formula:

$$Y = a*X + b, \tag{1}$$

where:

Y – predicted indicator;

a and b - coefficients;

X – the designation of a dependent factor.

The calculation of a and b ratios is performed according to the following formulae [7]:

$$a = \frac{\sum_{i=1}^{n}(Y\phi * X) - (\sum_{i=1}^{n} X * \sum_{i=1}^{n} Y\phi)/n}{\sum_{i=1}^{n} X^{\wedge}2 - (\sum_{i=1}^{n} X)^{\wedge}2/n}$$

(2)

$$b = \frac{\sum_{i=1}^{n} Y\phi}{n} - \frac{a * \sum_{i=1}^{n} X}{n}$$

(3)

where: Y_ϕ– actual values of dynamics series;

n – amount of observations.

The resulting model explaining the efficiency of risk management value is shown on Figure 1.

Figure 1
THE ECONOMETRIC MODEL OF RISK MANAGEMENT EFFECTIVENESS ACCORDING EXPERT ESTIMATES, AND THE INFLUENCE OF DIFFERENT FACTORS ON IT

Model 1: MNK, the observations 1-14 were use
Dependent variable: Y

	Coefficient	Statistical error	t-statistics	P-value
const	−11,1028	6,73086	−1,650	0,3469
X1	0,946158	0,324116	2,919	0,2101
X2	0,381456	0,142025	2,686	0,2269
X3	1,54016	3,32937	0,4626	0,7242
X4	2,60332	4,95647	0,5252	0,6921
X5	−0,250551	3,49470	−0,07169	0,9544
X6	0,123040	2,48928	0,04943	0,9686
X7	0,116088	0,210004	0,5528	0,6785
X8	6,00459	3,25705	1,844	0,3164
X9	−3,86422	3,91066	−0,9881	0,5038
X10	0,638142	1,05900	0,6026	0,6547
X11	−2,47919	5,24755	−0,4724	0,7190
X12	−4,59194	6,87084	−0,6683	0,6249

Average of dependent changes	27,64286	Statistical deviation of dependent changes	23,51303
The sum of quadratic residues	16,46336	Statistical error model	4,057507
R-square	0,997709	Corrected R-square	0,970222
F (12, 1)	36,29651	P value (F)	0,129067
Logarithmic likelihood	−20,99970	Akaike criterion	67,99940
Schwartz criterion	76,30714	Hennan-Quinn criterion	67,23037

Excluding the constant, the largest p-value was obtained for the variable 7 (X6)

The garph of observed deviations from the calculated values is shown on Figure 2, and it shows the degree of the model reliability according to the degree of calculated values scatter from the actual ones, that allows to perform a visual analysis of the developed model quality degree.

Figure 2
THE GRAPH OF OBSERVED AND CALCULATED VALUES ACCORDING TO THE MODEL
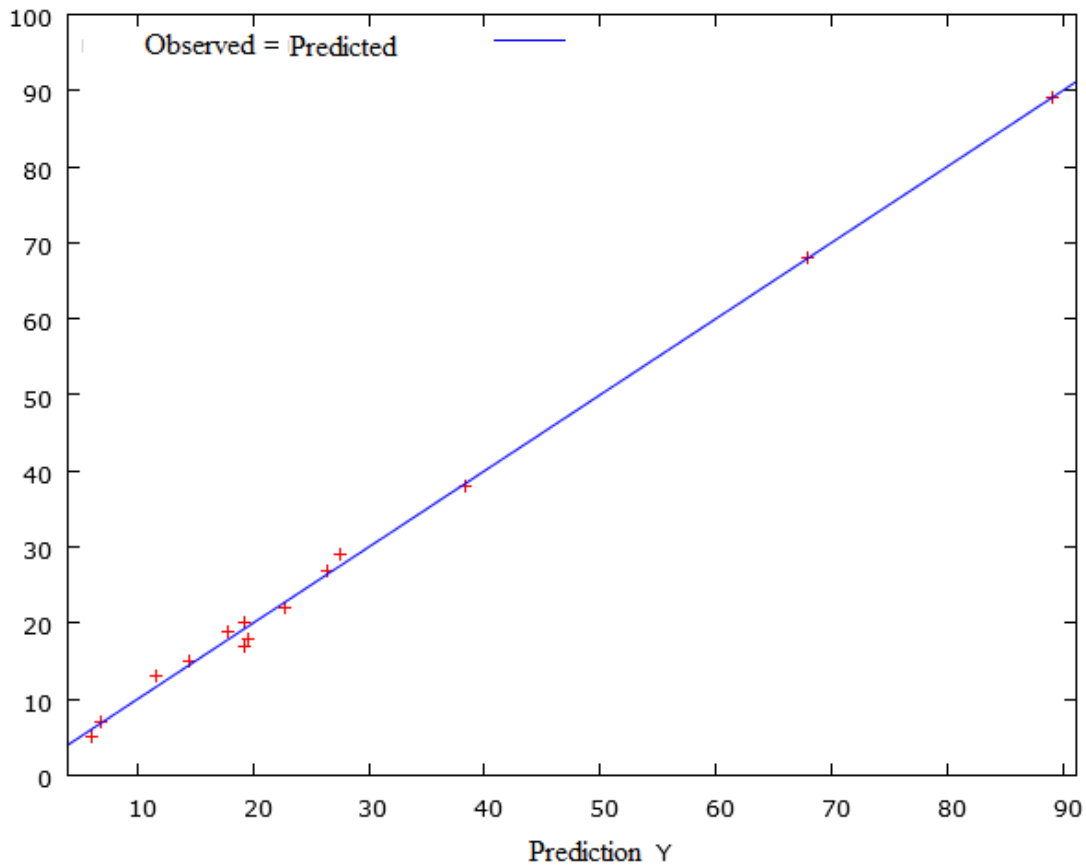
The visual analysis of observed and calculated model values graphs allows us to conclude that the observed values are spread evenly along the line of predicted values within the model, which allows you to make a preliminary conclusion about the reliability of the constructed model or of model system errors. However, this conclusion requires an analytical description, which will be discussed later.

It is also necessary to calculate and analyze the main indicators of the model importance as a whole:

- P-values of the coefficients;
- R^2 determination coefficient.

Typically, P-value is equal to the probability that a random variable with this distribution (the test statistic distribution at a zero hypothesis) takes a value no less than the actual value of the test statistic.

Let T(X) is the statistics used during the testing of some zero hypothesis H_0. It is assumed that if a zero hypothesis is true, then the distribution of this statistics is known. Let's denote the distribution function as F(t) = P(T<t). P-value (when a right sided alternative is checked) is usually determined as (Verbeek, 2004):

P(t) = P(T>t) = 1-F(t) (4)

When a left-sided alternative is checked:

$P_0(t) = P(T<t) = F(t)$ (5)

In the case of a two-aspect test p-value is equal to:

$P(t) = 2*\min(P_0, P)$ (6)

If p (t) is less than a predetermined level of significance, a zero hypothesis is rejected in favor of an alternative one. Otherwise, it is not rejected.

In other words, P-value indicates the probability that the corresponding t-statistics may be higher than an observed one.

If P-value is less than 0.05, the coefficient is significant one at 0.05 level.

If P-value is less than 0.01, the coefficient is significant one at 0.01 level.

The obtained P-values were as follows according to the model results:

- $P_{const} = 0,3469$;
- $P_{X1} = 0,2101$;
- $P_{X2} = 0,2269$;
- $P_{X3} = 0,7242$;
- $P_{X4} = 0,6921$;
- $P_{X5} = 0,9544$;
- $P_{X6} = 0,9686$;
- $P_{X7} = 0,6785$;
- $P_{X8} = 0,3164$;
- $P_{X9} = 0,5038$;
- $P_{X10} = 0,6547$;
- $P_{X11} = 0,7190$;
- $P_{X12} = 0,6249$.

The model does not have any significant factor which makes us think of a model specification error, presumably, about the inclusion of extra factors into a model, underestimating the importance of other factors.

It is also necessary to verify a model importance according to the determination coefficient to test the significance of the model as a whole.

A true model determination coefficient of a random variable y dependence on x attributes is defined as follows (Wooldridge, 2007):

$$R^2 = 1 - \frac{V(y|x)}{V(y)} = 1 - \frac{\sigma^2}{\sigma_y^2},$$

(7)

where $V(y|x) = \sigma^2$ is the conditional dispersion (according to x signs) of a dependable variable (the dispersion of a model accidental error).

This definition uses true parameters characterizing the distribution of random variables. If they use a custom estimation of corresponding dispersion values, they will obtain the formula for a selective determination coefficient (which is usually meant under determination coefficient) (Davidson and MacKinnon, 2004):

$$R^2 = 1 - \frac{\widehat{\sigma}^2}{\widehat{\sigma}_y^2} = 1 - \frac{ESS/n}{TSS/n} = 1 - \frac{ESS}{TSS},$$

(8)

$$ESS = \sum_{t=1}^{n} e_t^2 = \sum_{t=1}^{n} (y_t - \widehat{y}_t)^2$$

where: - the sum of regression residuals squares;

$$TSS = \sum_{t=1}^{n} (y_t - v)^2 = n\widehat{\sigma}_y^2$$

- total variance;

$y_t, \widehat{y}_t$ - actual and estimated values of an explained variable accordingly;

$$\overline{y} = \frac{1}{n} \sum_{i=1}^{n} y_i$$

— a selective average.

R^2 made 0.9977 in the resulting model. The interpretation of this indicator means that the model is unreliable, it is significant at 99.77%, i.e. 99.77% of probability index variation concerning an organization tax security violation according to expert estimations and the impact of risks on it is explained by the constructed model, and 00.03% of an indicator change is explained by the influence of random factors not included in a model.

At the same time it should be noted that the model is inadequate because of the absence of significant factors in it, presumably because of redundant variables inclusion in the model. Let's perform the test on the redundant variables in order to obtain an adequate model, its result is shown on Figure 3.

Figure 3
THE ECONOMETRIC MODEL OF RISK MANAGEMENT EFFECTIVENESS ACCORDING TO EXPERT ESTIMATES, AND THE INFLUENCE OF VARIOUS FACTORS ON IT AFTER THE REMOVAL OF EXCESS VARIABLES

Model 1 testing:

Zero hypothesis: the regression parameters are zero ones
X4, X5, X6, X7, X10, X11, X12
Test statistics $F(7, 1) = 0.699012$,   P-value 0,729394
The exclusion of variables improved the 0 out of 3 used criteria

Model 2: MNK, observations 1-14 were used
Dependent variable: Y

	Coefficient	Statistical error	t-statistics	P-value	
const	−11,6974	3,70738	−3,155	0,0135	**
X1	0,955130	0,178389	5,354	0,0007	***
X2	0,461713	0,0599478	7,702	5,73e−05	***
X3	2,13203	0,727017	2,933	0,0189	**
X8	4,95817	1,23762	4,006	0,0039	***
X9	−3,68834	1,24828	−2,955	0,0183	**

Average of dependent changes	27,64286	Statistical deviation of dependent changes	23,51303
The sum of quadratic residues	97,01993	Statistical error model	3,482455
R-square	0,986501	Corrected R-square	0,978064
F (12, 1)	116,9276	P value (F)	2,95e−07
Logarithmic likelihood	−33,41615	Akaike criterion	78,83231
Schwartz criterion	82,66665	Hennan-Quinn criterion	78,47737

According to the obtained model, P-values of the factors were as follows:

P_{const} – 0,0135;
P_{X1} – 0,0007;
P_{X2} – 5,73e-05;
P_{X3} – 0,0189;
P_{X8} – 0,0039;
P_{X9} – 0,0183.

All the factors of the resulting model are significant, the determination coefficient R^2 is also a significant one and makes 0.9865, which indicates a high quality of the developed model and its adequacy.

The visual analysis of observed and calculated value graph also confirms the conclusion about the model reliability (Figure 4).

Figure 4
THE GRAPH OF OBSERVED AND CALCULATED VALUES ACCORDING TO A NEW MODEL
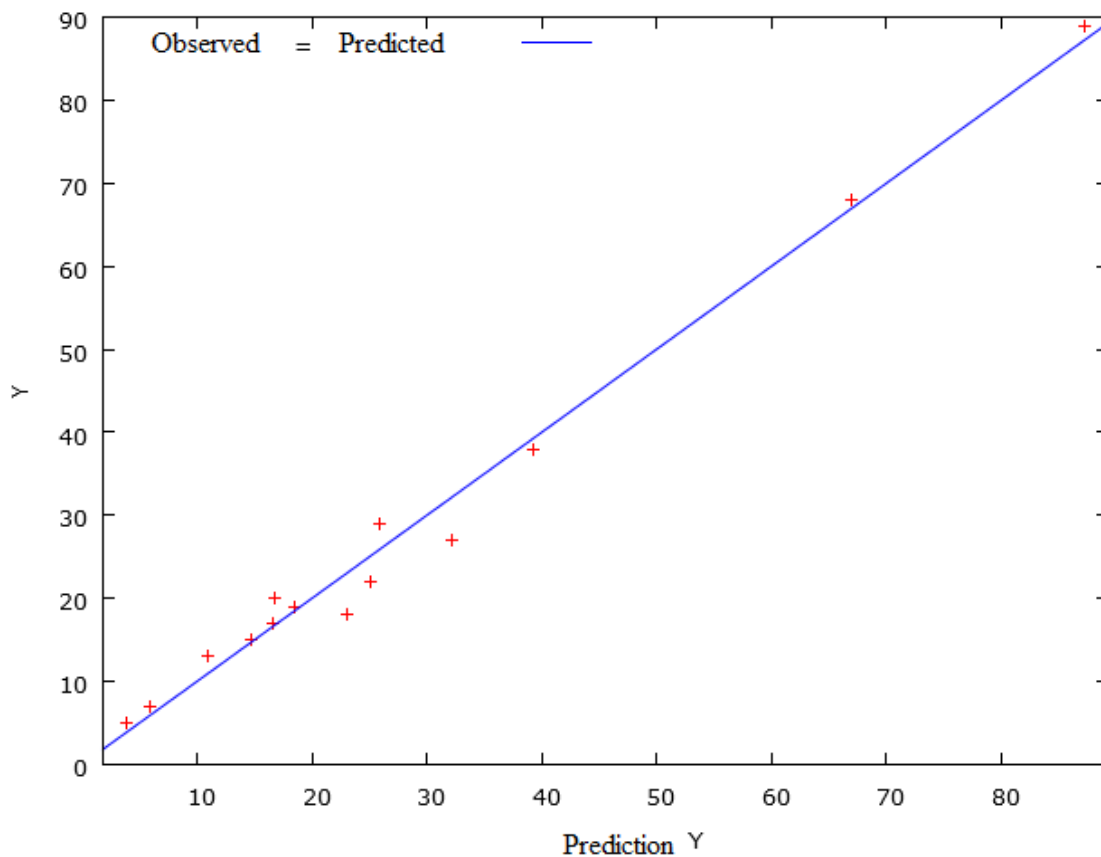
The final stages of a model quality testing are the heteroscedasticity and multicollinearity tests.

Heteroscedasticity leads to the fact that regression coefficients are not the minimum variance estimates, therefore, they are not the most effective coefficients anymore. Thus, the conclusions obtained on the basis of t and F-statistics as well as interval estimates will be unreliable ones. Dispersions and hence the standard errors of these coefficients will be biased ones. If an offset is negative one, the estimated standard errors will be smaller than they should be, and a verification test is more than in reality. Thus, it can be concluded that the coefficient is significant one when it is not such. Conversely, if an offset is a positive one, the estimated errors will be larger than they should be, and check criteria will be less. So, an error acceptance of a zero hypothesis is possible.

In order to confirm the presence or absence of heteroscedasticity it is advisable to use White test.

This test is carried out as follows (Verbeek, 2004):

a) for example, an initial model is the following one:

$$y_i = b_0 + b_1 x_{1i} + b_2 x_{2i} + \varepsilon_i.$$

(9)

MNK estimate its parameters and get the regression residues $\hat{\varepsilon}$;

б) n auxiliary regression of residual squares is estimated according to all regressors, their squares, pairwise products and constant:

$$\hat{\varepsilon}^2 = \alpha_0 + \alpha_1 x_{1i} + \alpha_2 x_{2i} + \alpha_3 x_{1i}^2 + \alpha_4 x_{2i}^2 + \alpha_5 x_{1i} x_{2i} + v_i,$$

(10)

where v_i - normally distributed error, not dependent on ε_i.

It is known that $D(\varepsilon_i) = M(\varepsilon_i - M(\varepsilon_i))^2$. However, while it is assumed that $M(\varepsilon) = 0$, then $D(\varepsilon_i) = M(\varepsilon_i^2)$. Since a true value of residual squares ε_i^2 is unknown the question of heteroscedasticity presence is solved on the basis of their selective counterparts, $\hat{\varepsilon}^2$.

An auxiliary regression has precisely this form, because it is necessary to examine whether there is a systematic relationship between the changes of $\hat{\varepsilon}^2$ and any relevant variable model (in order to see the variable included in the auxiliary regression are the relevant ones, an error should be represented in the following form $\varepsilon_i = y_i - b_0 - b_1 x_{1i} - b_2 x_{2i}$ and raise this expression to the square).

в) A zero hypothesis is checked:

H$_0$: $\alpha_2 = 0$ and $\alpha_3 = 0$ and $\alpha_4 = 0$ and $\alpha_5 = 0$ and $\alpha_6 = 0$ (11)

Using Fisher F– criterion.

If the actual values of statistics exceed the critical values of Fрасч > Fкр distribution (α, v1 = p, v2 = n-p-1), then the zero hypothesis about the homoscedasticity of residues is rejected, i.e. the conclusion about the presence of heteroscedasticity is made.

The graphical analysis of residue spread according to resulting model allows us to conclude that the heteroscedasticity of residues is absent due to the random nature of model remains scatter (Figure 5).

Figure 5
RESIDUE SCATTER GRAPH ACCORDING TO AN OBTAINED MODEL
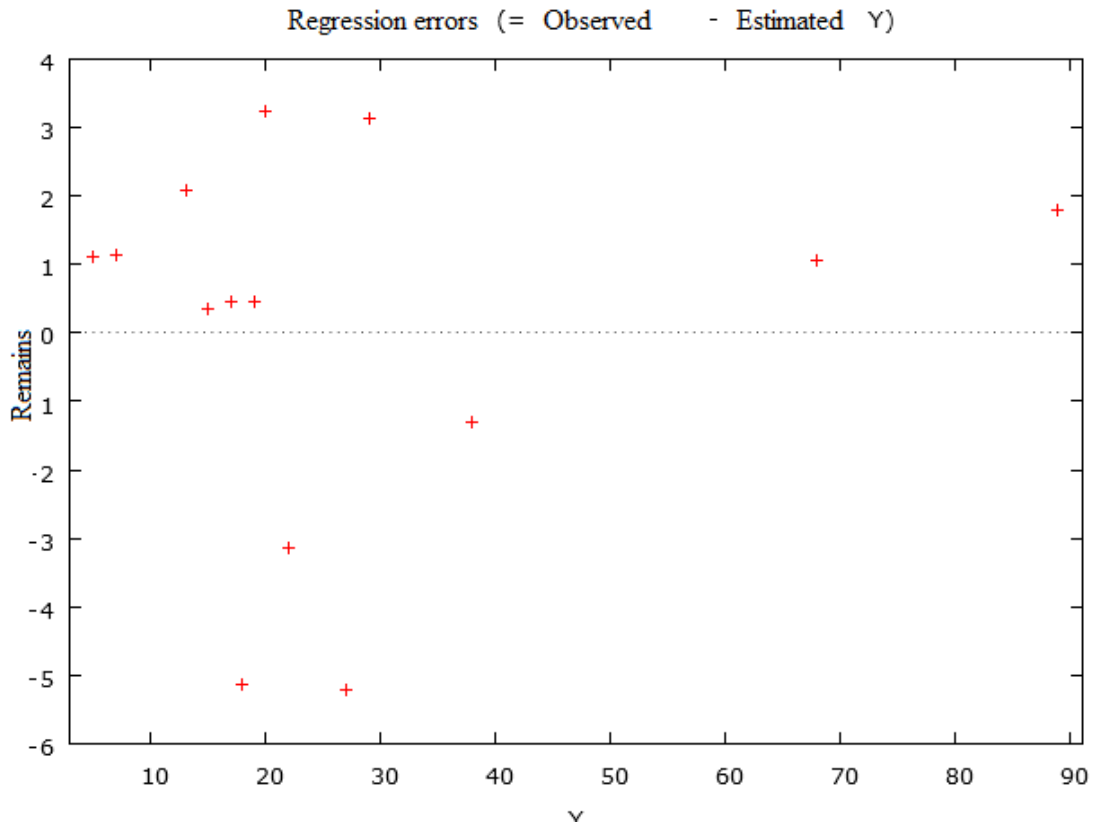
A final confirmation of this assumption requires the implementation of the White's test using the applied software package Gretl. Figure 6 shows the results of this test.

Figure 6
WHITE'S TEST FOR THE DEVELOPED MODEL OF RISK MANAGEMENT EFFECTIVENESS ACCORDING TO EXPERT ESTIMATES AND THE INFLUENCE OF DIFFERENT FACTORS ON IT

White's test for heteroscedasticity
MNK, observations 1-14 were used
Dependent variable
Skipped due to perfect collinearity

	Coefficient	Statistical error	t-statistics	P-value
const	−2,29421	30,6096	−0,07495	0,9439
X1	−1,88534	2,45001	−0,7695	0,4845
X2	−0,128840	0,606836	−0,2123	0,8422
X3	5,02177	19,3519	0,2595	0,8081
X8	77,1361	37,5819	2,052	0,1094
X9	6,05611	6,87622	0,8807	0,4282
sq_X1	0,0401622	0,0789391	0,5088	0,6377
sq_X2	0,000965594	0,00374754	0,2577	0,8094
sq_X3	−0,612234	2,42678	−0,2523	0,8133
sq_X8	−36,6863	18,2334	−2,012	0,1145

Unrepaired R-squared = 0,819459

Test statistics TR^2 = 11,472425,
P-value = P (Хи square (9) > 11,472425) = 0,244710

It is necessary to find $F_{crit.}$, which resulted equal to 18,307 (fig. 7) for the final confirmation of residual heteroscedasticity presence or absence.

Figure 7
CRITICAL VALUE FOR WHITE'S TEST

Хи square (10)
      Right-sided probability = 0,05
      Complementary probability = 0,95

Critical value = 18,307

Thus White's test showed that P-value makes 0.240261 (which is more than P = 0,01 and P = 0,05), at $F_{rasch.}$ (11.4724) $<F_{kr.}$ (18.307) Thus, the hypothesis of the presence of N_0 about residue homoscedasticity is taken and the alternative hypothesis H_0 about the presence of residual heteroscedasticity is rejected, i.e. the residual dispersion is constant and the model remained an accurate one.

The final stage of econometric model testing in respect of its accuracy is the model check for dependent variable multicollinearity. A high correlation between the explanatory variables x is understood by multicollinearity. It can manifest itself in a functional (an explicit) and a stochastic (a latent) form. Within the functional form of multicollinearity at least one pair of links between x variables is called a linear functional dependence. There is a strong correlation in a latent form between two explanatory variables.

There are no precise quantitative criteria for the determination of multicollinearity presence or absence. Nevertheless, some heuristic approaches are used for its detection. For example, the method of inflation factors which is the following one. An original model of multiple linear regression analyzes all additional models, in which any of the exogenous variables become an endogenous one (Cameron and Trivedi, 2005):

$$Xj = \theta_0 + \theta_1 * X_1 + \cdot \cdot \cdot + \theta_{j-1} * X_{j-1} + \theta_{j+1} * X_{j+1} + \cdot \cdot \cdot + \theta_M * X_M + \upsilon_j \qquad (12)$$

where θj — regression coefficient;
j = 1, M;
υj — random variable, $\upsilon j \sim N(*)$.

Then determination coefficients are calculated for all received R^2_j models. Inflation factors are calculated on the basis of the acquired determination coefficients (Fiebig, 2007):

$$VIF_j = \frac{1}{1 - R_j^2}$$

(13)

If the minimum value of the inflation factor is greater than 5 (10), then they make the conclusion about the possible presence of multicollinearity:

$$\min_{1 \leq j \leq M} VIF_j > 5$$

(14)

The results of inflationary factor methods are shown on Figure 8.

Figure 8
THE RESULTS OF INFLATION FACTOR METHOD APPLICATION IN ORDER TO IDENTIFY MULTICOLLINEARITY

Inflationary factor method
Minimum possible value = 1.0
The values > 10.0 may indicate the presence of multicollinearity

```
        X1      3,104
        X2      3,906
        X3      1,195
        X8      1,200
        X9      1,762
```

VIF(j) = 1/(1 - R(j)^2),

where R(j) - is a multiple correlation coefficient between the variable j and the other independent variables

Thus, econometric methods determined that the multicollinearity between independent factors is absent.

RESULTS AND DISCUSSION

The resulting model of risk management effectiveness at the state level (Y) and the influence of different factors on it is the following one:

$$Y = -11{,}6974 + 0{,}9551 * X_1 + 0{,}4617 * X_2 + 2{,}13203 * X_3 + 4{,}95817 * X_8 - 3{,}68834 * X_9,$$

where:
- X_1 - the availability of existing and non-developed ISO standards for risk management, adopted as national ones;
- X_2 - the availability of other existing documents for risk management of a national or a regional level;
- X_3 - the training of risk management experts at educational institutions;
- X_8 - the participation of a country in ISO/TC 262 committee according to risk management standards;
- X_9 - the participation of a country in a working group according to UN WP.6 risk management standards within regulatory control systems.

According to the obtained results of econometric modeling the following conclusions can be made for Russian Federation risk management system:

- It is necessary to develop ISO national standards on risk management, as Russia is far behind the developed countries (more than 5 times in comparison with the US and the UK) from developed countries;

- According to the regional documents of risk management control the situation is pretty good (approximately 45 documents were adopted), but it must be supported by risk management national standards;

- It is advisable to increase the number of specialized programs on risk management and the training of practical experts in the field of risk management;

- Russia participation in ISO/TC 262 committee in respect of risk management standards and UN working group WP.6 in respect of risk management standards seems very promising one in terms of international and interstate exchange of experience in the field of risk management.

Thus, the authors of the study studied risk management effectiveness indicator at a state level among 14 countries with developed and developing economies according to 12 main factors. The study results provide the basis for risk management system reforming both at the national and at the business level. At that reforms should have an integral character and involve the exchange of knowledge and experience between different spheres of risk management manifestation.

ACKNOWLEDGEMENTS

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ANALYSIS OF EFFICIENCY OF THE INNOVATIVE PROJECT IN THE FIELD OF CHEMISTRY FUZZY LOGIC

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ABSTRACT

Chemical industry economy consists of criteria of its numerous sub-branches: petrochemical, agrochemical, organic and inorganic, polymer, pharmaceutical, elastomer and some others. Fine chemicals demand contraction in internal market, first of all on the part of high technology industry and defense complex. Present-day risk calculation and assessment include subjectivity and fundamental background factors which lead to mistakes in project risk assessment. Possibility theory is a new actively developing approach to risk assessment. Lately fuzzy modeling is one of the most active and promising applied research tendencies in the field of management and decision making. Investment project "New products of ternary anionic (co)polymerization of cyclic carbonates as polycarbonate analogues" risk is a probability of project future cash flow deviation from the expected cash flow driven by external (legislation, market response to produced goods, rivals activity) as well as internal factors (personnel competence, mistakes in project characteristics determination) which occur due to incomplete and asymmetrical information.

Keywords: *polycarbonate analogues, internal rate of return, fuzzy logic.*

INTRODUCTION

Chemical branch is a part of heavy industry. It includes chemical, oil and organic manufacturing. Owing to chemical industry acids, alkalies, fertilizers, dye staffs, lacquers, pharmaceuticals and household detergents are produced.

Chemical industry includes a wide range of household goods. Raw materials and utilities for other industries (woodworking, medical, biological, textile, clothing and footwear), agriculture and transportation are manufactured.

Chemical and petroleum feedstock undergoes a great number of stages on the way to final product turnout. It causes high stock intrabranch consumption in chemical industry.

Chemical industry economy has some peculiarities. It includes a huge number of different manufacturing plants. Chemical branch is of profound importance for Russian economy.

In Russian Federation chemical industry has some specific features. The majority of chemical plants are situated in the western part of the country. This region has hardly any water or energy resources but most population is concentrated there. Therefore manufacturing and final product consumption areas are different in terms of location.

Chemical industry includes three main parts: mining, basic and organic chemistry. In addition polymer chemistry can be singled out.

Mining industry deals with extraction of fresh raw materials: phophorites, apatites, salts, sulphur, boron, etc. Russia is very rich in these materials deposits. They are concentrated mainly in the European part of our country which makes conditions for many plants location there.

Chemical industry can use a great variety of raw materials to produce final product. Petroleum, natural gas, shale rocks, timber, wastes from other industries (Beilin and Arkhireev, 2006) and many other raw material resources are used.

Chemical industry produces final product from mineral, hydrocarbon and other types of raw materials by means of chemical reactions exposure (Beilin and Arkhireev, 2009). On a world-wide scale chemical sector brings 3 trn dollars. Chemical industry is most important for such regions as Povolzhye, Central, Volga-Vyatka and Central Black Earth regions and Ural. For some regions of Russia chemical industry is the foundation of their economy. They are Tula, Novgorod, Perm regions and Tatarstan. Russian chemical industry products are in high demand abroad. Russian chemical industry export turnover is about 7 per cent of full export volume.

Chemical production is characterized by very low labor coefficient due to increased automation of processes, many of which are continuous.

Economic expenditures of final product manufacture constitute an average of 60 per cent. Varnish and paint production as well as plastics and rubber resin production have the highest material-output ratio (Beilin and Arkhireev, 2005). Mining, chemical reagents, synthetic yarns and fibres manufacture have the lowest material-output ratio (Beilin and Arkhireev, 2011). Fuel and energy costs constitute an average of 15 per cent. Packaging and containers for liquid and gaseous highly corrosive products require immense input.

Let us name the main factors holding back steady performance of the chemical complex and key restrains of companies development:

1) Insufficient level of research and development and their introduction into the industry.

Material and technical resources of the majority of research and development organizations is destroyed. There has been a significant brain drain of scientific personnel. As a result, research and development organizations' activity does not influence considerably chemical industry condition. The gap between industrial plants' need for modern research work and research and development organizations' offer is growing.

2) Large scale of physically worn out and outmoded core process equipment, transport means, power assets and other facilities. Process equipment installed at some factories is vastly inferior in technical specifications compared to foreign counterparts. Its average production life is 20 years and above. Home equipment manufacturing is virtually stopped. In contrast, average equipment production life at chemical factories in the USA constitutes approximately 6 years. The extent of wear of core production funds in chemical industry constitutes approximately 54%, and of equipment 67.2%, moreover, some types of equipment in caustic ash, polystyrene and styrene copolymers production the extent if wear comprises over 80%, in some cases – 100%. Large scale of physically worn out of specialized automobile and railway transport. Coefficient of fixed-capital assets renewal in chemical and petrochemical industry in 2010–2015 was not more than 2 per cent.

3) Prices and tariffs disparity for natural monopolies production. With the growth of prices for chemical products in the course of six years (2010–2015) by 2.44 times, the prices for primary and energy commodities grew considerably higher: for crude oil by 4.8 times, for natural gas by 3.53 times, for industrial consumer electric energy by 3 times, which leads to decrease in price competitiveness of chemical products.

4) Deficiency in funds available for investment, mainly due to the absence of business gears stimulating inflow of investments, foreign among others, into industry development. Recently investment volume in the industry has slightly increased, nevertheless in 2016 it is estimated to be only 52% as compared with numbers in 2011. Coefficient of fixed-capital assets renewal is 4 times lower than the minimum requirement. Most of the operating factories have to invest the considerable part of profit into circulate assets shortage replenishment and equipment repair.

5) Fine chemicals demand contraction in internal market, first of all on the part of high technology industry and defense complex. In the course of the last ten years defense industry due to its low paying capacity hasn't provided necessary demand for a range of fine chemicals. Nowadays in Russia production of a number of polymer products (polyimides, polycarbonates (Beilin and Arkhireev, 2011)), specialty rubber, binding materials, sealing compositions, etc. has been stopped.

METHOD

Detailed engineering study and risk calculations became an indispensable part of chemical company's successful activity. Nevertheless, more often than not companies have to make decisions in the conditions of uncertainty which can lead to unexpected consequences and, as a result, undesired outcomes and losses. Particularly severe consequences can be caused by wrong decisions in long-term investments, which are normally implied in capital investment projects evaluation. Therefore early recognition as well as adequate and more precise risk calculation is one of the vital problems of the modern investment analysis. Unfortunately, present-day risk calculation and assessment include subjectivity and fundamental background factors which lead to mistakes in project risk assessment. Possibility theory is a new actively developing approach to risk assessment. Lately fuzzy modeling is one of the most active and promising applied research tendencies in the field of management and decision making.

Notions "risk" and "uncertainty" need to be distinguished. Uncertainty is a situation when many outcomes are possible but the results of actions in this case are not deterministic, i.e. their possibilities are unknown. Risk is a situation which has a finite number of outcomes with known possibilities for each of them, a possibility of circumstances emergence making the achievement of expected results from the desired goal implementation uncertain or impossible; loss probability or probability to get a different outcome. Thus, risk is a subjective assessment of objective uncertainty. Uncertainty is an unavoidable characteristics of the market environment, whereas risk is a quantitative characteristics of loss occurrence.

Investment project risk is a probability of project future cash flow deviation from the expected cash flow driven by external (legislation, market response to produced goods, rivals activity) as well as internal factors (personnel competence, mistakes in project characteristics determination) which occur due to incomplete and asymmetrical information.

Below the main methods for risk assessment of investment project analysis are given.

Qualitative analysis is identification of definite types of project risks which influence the cash flow formation as well as possible reasons of their appearance. Its advantages include visible results and the fact that identified risks can be used to get recommendations for their minimization. The disadvantages include the lack of quantitative risk assessment.

Quantitative analysis is the assignment of definite quantitative characteristics to risks in order to show quantitative consequences for a project of any given risks. Its advantages include

ease of use and clarity of results. Its disadvantages include change assumption for one criterion only when the others are considered unchangeable.

Scenario analysis is project inefficiency risk identification as the sum of project NPV negative values probabilities. Its advantages include ease of use and clarity of results. Its disadvantages include subjectivity in probability assumption of every scenario analyzed and infinite number of possible variants and scenarios of project behaviour.

Simulation modeling (Monte-Carlo method) is obtaining financial rate of return distribution by multiple iterations, i.e. multiple NPV values with estimated average as well as risk magnitude. The advantages include more precise and concise project risk assessment and high compatibility with other economic statistical methods as well as with games theory and other operational research methods. The disadvantages are based on fundamental assumptions: variables natural independence (their uncorrelatedness), normal distribution, complexity and awkwardness of calculations.

Possibility theory (or Fuzzy sets theory, or Fuzzy Logic) is a new approach to business processes description which includes uncertainty making difficult or impossible to apply precise quantitative methods and approaches. Fuzzy sets theory dates back to 1965 when Professor Lotfi Zadeh from Berkley University published his fundamental work "Fuzzy Sets" in the "Information and Control" journal. The main difference of this method is introduction of linguistic variables (subjective entities). Linguistic variables are variables which cannot be characterized in mathematical language, i.e. it is difficult to quantify them objectively (Castro et al., 2007). For example, concepts "low-scale" and "medium-scale" (speaking about business), "high" or "low" (about interest rate) don't have fixed limits and cannot have a precise mathematical description.

According to L. Zadeh, a linguistic variable is a variable which has words or phrases of a natural language as its value. In the literature on fuzzy sets linguistic variables are also called "term-sets".

Example 1

To get an integral risk criterion, the values of price change, demand and other quantitative variables may not be enough. Many qualitative variables also should be taken into consideration, such as rivals' potency, management competence, weather conditions (especially for building projects). Thus, to get a linguistic variable numerical evaluation for "construction activities conditions" we specify value limits from 0 to 10, where 0 stands for the most severe conditions interfering with the process of construction. Following the common sense and expert evaluation it can be claimed that if the construction work is planned in the residential zone (where risks are higher) and without mobilization works, its evaluation will range from 0 to 3 which means severe conditions of construction work. If a building is constructed on a prepared building site outside residential area, the values will range from 7 to 10 indicating favorable conditions for construction work. The variable will range from 3 to 7 if weather conditions are characterized as both favorable and intervenient (Zhou et al., 2007). The values are given by evaluators or a group of experts directly recruited for investment project analysis.

Example 2

A linguistic variable can also be illustrated by limits fuzziness of the variable "low interest rate". What credit rate is considered low? The answer can be searched by questioning a number of experts. Thus, based on common sense we can answer, for example, that below 7% is

a low credit rate, from 7 to 15% it is middle, and over 16 it is high. Therefore, the lines between these numbers are vague and the notion "credit low cost" is a subjective evaluation.

The main method tool is membership function. It is a tool used to transfer linguistic variables into mathematical language for further fuzzy sets method application.

Membership function $\mu_A(x)$ is some mathematical function indicating degree or certainty with which some x set members pertain to the fuzzy set A. The more argument x correspond with the fuzzy set A, the more $\mu_A(x)$ value, i.e. the closer the argument value is to 1.

Expert evaluations can act as the function plot foundation.

Example 3 (example 2 extension):

Figure 1
MEMBERSHIP FUNCTION FOR THE VARIABLE «LOW INTEREST RATE»
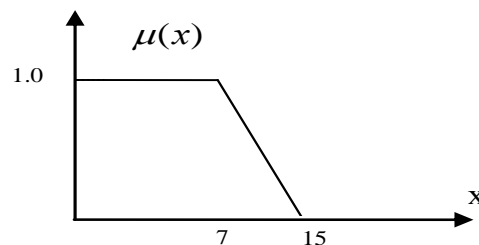
In figure 1 membership function for the variable «low interest rate» is shown, where interest rate values rest on the x-axis and membership function values for term-sets "high interest" - on the y-axis. By virtue of the fact that values over 15% were considered as high interest rate by experts, the membership function takes on the 0 value which corresponds to the verity of the interest membership to the term-set "high interest". If the interest values range from 0 to 7% (i.e. the interest rate is *low*), the membership function value equals 1. In between 7 and 15% the membership function gradually decreases proving the statement as it approaches interest values of 15%.

The main types of membership functions include: triangular, trapezoidal, piecewise linear, Gaussian distribution and sigmoid. According to the expert evaluations of fuzzy sets membership functions two groups of methods are distinguished: direct and indirect methods.

Direct methods are characterized by direct expert rules setting for $\mu(x)$ membership function values determination which characterizes element x. Examples of direct methods are membership function setting by a table, graph or equation (Kayacan, 2009). The shortcoming of this group of methods is a large deal of subjectivity.

In indirect methods the membership function values are chosen in such a way to meet pre-laid down conditions. Expert information is only raw information for later processing. This group of methods includes such membership functions plotting techniques as membership functions plotting based on pairwise comparison, using statistical data, based on ordered estimate, etc.

As long as fuzzy sets theory is a separate branch of mathematics, it is based on its own prerequisites. In the work of L. Zadeh and R.Bellman basic properties which fuzzy sets should

have are stated: normality, unimadality, convexity (A Novel Algorithm for Tuning of the Type-2 Fuzzy System, 2007). Membership function triangular shape is the most often used in investment projects analysis practice. Triangular number A is set by three parametres: bottom value (a), modal (b) and ceiling value (c), which correspond with pessimistic, basic and optimistic scenarios respectively.

RESULT

Let us give form to the linguistic variable "Not very small and not very big internal rate of return" innovative project risk "New products of ternary anionic (co)polymerization of cyclic carbonates as polycarbonate analogues" in conditions of global financial crisis and anti-Russia sanctions.

Given:

Small IRR   *Big IRR*

$$A = \left\{ \frac{1}{11}, \frac{0,8}{12}, \frac{0,6}{13}, \frac{0.4}{14}, \frac{0.2}{15} \right\}$$ $$B = \left\{ \frac{0,2}{11}, \frac{0,4}{12}, \frac{0,6}{13}, \frac{0,8}{14}, \frac{1}{15} \right\}$$

Solution:

Very small IRR   *Very big IRR*

$$CONA = \left\{ \frac{1}{11}, \frac{0,64}{12}, \frac{0,36}{13}, \frac{0.16}{14}, \frac{0.04}{15} \right\}$$

$$CONB = \left\{ \frac{0,04}{11}, \frac{0,16}{12}, \frac{0,36}{13}, \frac{0.64}{14}, \frac{1}{15} \right\}$$

Not very small IRR   *Not very big IRR*

$$CON\overline{A} = \left\{ \frac{0}{11}, \frac{0,36}{12}, \frac{0,64}{13}, \frac{0.84}{14}, \frac{0.96}{15} \right\}$$ $$CON\overline{B} = \left\{ \frac{0,96}{11}, \frac{0,84}{12}, \frac{0,64}{13}, \frac{0.36}{14}, \frac{0}{15} \right\}$$

Not very small and not very big IRR

$$CON\overline{A} \bigcap CON\overline{B} = \left\{ \frac{0}{11}, \frac{0,36}{12}, \frac{0,64}{13}, \frac{0.36}{14}, \frac{0}{15} \right\}$$

Now let us consider an investment project where *NPV* can be narrowed down to the triangular number $NPV = (NPV_1, \underline{NPV}, NPV_2)$,

where NPV_1 – net cash revenue with a pessimistic scenario;

NPV_2 - net cash revenue with an optimistic scenario;

$\underline{NPV}$ – expected net cash revenue.

G project efficiency criterion (as a rule is taken to be equal to zero).

The project is considered profitable if *NPV* is more than criterion *G* set by investors.

Having set the extreme values of *NPV*, the mebership function can be described:

$NPV_1 = \alpha(\underline{NPV} - NPVmin) + NPVmin$

$NPV_2 = NPVmax - \alpha(NPVmax - \underline{NPV})$

$$\mu_A(x) = \begin{cases} 0, G \le NPV1 \\ \dfrac{G - NPV1}{NPV2 - NPV1}, NPV1 < G < NPV2 \\ 1, G \ge NPV2 \end{cases}$$

Integrating we can transpose the above equations to the following representation:

$$\mu(x) = \begin{cases} 0, G < NPV\min \\ R\left(1 + \dfrac{1-\alpha}{\alpha}\ln(1-\alpha)\right), NPV\min \le G < \underline{NPV} \\ 1 - (1-R)\left(1 + \dfrac{1-\alpha}{\alpha}\ln(1-\alpha)\right), \underline{NPV} \le G < NPV\max \\ 1, NPV\max \le G \end{cases},$$

where

$$R = \begin{cases} \dfrac{G - NPV\min}{NPV\max - NPV\min}, G < NPV\max \\ 1, NPV\max \le G \end{cases},$$

$$\alpha = \begin{cases} 0, G < NPV\min \\ \dfrac{G - NPV\min}{\underline{NPV} - NPV\min}, NPV\min \le G < \underline{NPV} \\ \dfrac{NPV\max - G}{NPV\max - \underline{NPV}}, \underline{NPV} \le G < NPV\max \\ 0, NPV\max \le G \end{cases}$$

Risk assessment:

ranges from 0 to 1

every investor according to their investment preferences can classify the risk values chosing the inappropriate risk values window.

The advantages of the method:

based on fuzzy sets theory a full range of investment process possible scenarios is formed;

the decision is made based on the values plurality and not two values of project performance;

the expected project performance is not a single-point value but rather an interval value field with its expectation distribution characterized by the membership function of a corresponding fuzzy number.

Let us discuss NPV of innovative project "New products of ternary anionic (co)polymerization of cyclic carbonates as polycarbonate analogues" with the following characteristic values:

The project will be implemented in the course of 3 years = 3; Upfront investment figures are precise and constitute IC = 4 mln rubles; Discount rate can fluctuate in the range from 15% to 25% per annum; Net cash flow is planned in the range from PVmin = 0 to PVmax = 3 mln rubles; Depreciated (salvage) cost of the project equals zero.

Let us apply fuzzy logic method for risk analysis. It follows that:

$NPVmin = -4 + 0/(1+0,25)^1 + 0/(1+0,25)^2 + 0/(1+0,25)^3 = -4$ mln r.

$NPVmax = -4 + 3/(1+0,15)^1 + 3/(1+0,15)^2 + 3/(1+0,15)^3 = 3,31$ mln r.

$\underline{NPV} = -4 + 1,5/(1+0,2) + 1,5/(1+0,2)^2 + 1,5/(1+0,2)^3 = -0,84$ mln r.

Figure 2
TRIANGULAR NUMBER FOR THE CONSIDERED PROJECT
NPV = (-4;-0,84;3,31)
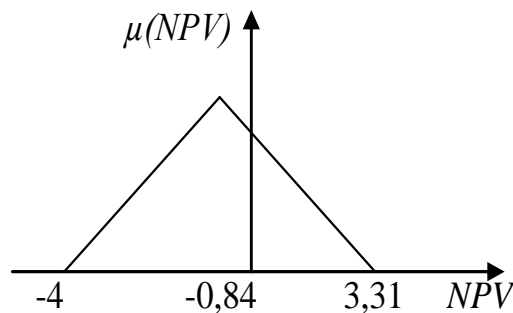
CONCLUSION

Final product can be manufactured from different raw materials. At the same time different products can be manufactured from the same raw material. NPV explicit value is -0,59, whereas average is -0,51. As NPVmin<G<NPVmax, it means $\mu(x) = 0,55$. Risk manager can set a risk aversion scale themselves going by project additional parameters and own preferences. Using the "Risk Score" Table data (Narendra, 2004) it can be inferred, that the risk of the innovative project "New products of ternary anionic (co)polymerization of cyclic carbonates as polycarbonate analogues" is very high (tab. 1).

Table 1
"RISK SCORE"

$\mu(x)$	Innovative project risk score	Company investment decision
0 – 0,07	Very low	Definitely accept the project
0,07 – 0,15	low	Accept with caution and further monitoring
0,16 – 0,35	average	Accept with restrictions
0,36 – 0,4	high	Reject and reconsider the project
> 0,40	very high	Definitely reject

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THE ENERGY CONSUMPTION OF DOMESTIC INDUSTRIAL PRODUCTION AS A KEY FACTOR IN THEIR LOW EFFICIENCY

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ABSTRACT

The article is devoted to theoretical and practical aspects of contradictions of economic development, which is the juxtaposition of the ever-increasing needs of society and the scarcity of resources through which these needs can be met. From this contradiction arises the problem of extensive growth in the consumption of resources, and the desire of society to promote a more rational production. One of the main factors of production in industrial enterprises is the energy as the total amount of fuel and energy resources spent for production per unit of output, measured in physical or value units, as well as specific energy consumption. For the domestic industry traditional property is an inefficient use of fuel and energy resources, which according to some experts, nearly half of their total use. In the Russian economy the most energy-intensive industries are in the manufacturing industry. Also for data production and have a major share in the total consumption of fuel and energy resources in the economy. Moreover, the intensity of use of fuel and energy resources in this sector of the domestic industry in recent years has not practically changed. Therefore, the challenge of growth for socio-economic development is currently under threat, the main source of which is a certain kind of stagnant processes in the national industry. In General, as was explained in the article, one of the main reasons hindering the increase of the efficiency of industrial production in Russia is high energy. Also the intensity of use of fuel and energy resources in the national economy still remains one of the most high. In addition, this contributes to the preservation of the inertial nature of the growth process of consumption of fuel and energy resources in the Russian industry. In the domestic industry is not observed positive changes in the high intensity of labor, which in aggregate have negative effects on the labor productivity and capital productivity.

Keywords: industry, national economy, energy resources, energy intensity, gross value added, industry sector.

INTRODUCTION

Key contradiction of economic development, in theoretical and practical aspects, is opposition of escalating requirements of society and deficiency of resources by means of which these requirements can be satisfied. The problem of the extensive accumulation of volumes of the consumed resources (accompanied with deterioration of the made production, economy on neutralization of negative impact on the environment, deterioration of life of people, etc.), and also aspiration of society to ensuring more rational production (due to achievement of a number

of the balanced purposes, fuller requirements satisfaction at the same volume of the used resources, increases in life expectancy, increase in education level and culture, ensuring social stability and overcoming poverty, achievement of a high level of employment, environment protection and so forth) (Popova, 2013) follows from the same contradiction. Besides, an important role is played also by implementation of the requirement of stability (Tatuev, 2014; Kiseleva & et., 2016; Tatuev, 2015).

METHODS

System approach which regarding basic receptions is supplemented with theoretical and empirical generalizations, method of statistical groups, a settlement and constructive method, the functional and structural analysis, an expert method, method of graphic visualization was the basis for methodology of a research.

MAIN PART

3.1 Dynamics of use of fuel and energy resources on GDP unit at constant parity of purchasing power over the leading countries

One of the major production factors at the industrial enterprises is energy – cumulative quantity of the fuel and energy resources spent for the production of a unit of production which is measured in physical or cost units and also in specific energy consumption (Tamoshina & Logachev, 2013). For the domestic industry traditional property is inefficient use of fuel and energy resources. For example, by estimates of various experts the share of the resources which are inefficiently used in production activity reaches 35-45%, and possible volumes of annual economy – about 350-400 million tons of conditional fuel (Martynov, 2014). Thus, considering domination of fuel and energy resources in industrial productions, high relevance is acquired by a task of the analysis of processes of their consumption.

In the figure 1 the chart illustrating intensity of use of fuel and energy resources on GDP unit at the constant parity of purchasing power (PPP) is submitted. Data are submitted over the leading countries by the economy size for 2015.

Figure 1
INTENSITY OF USE OF FUEL AND ENERGY RESOURCES ON GDP UNIT AT THE CONSTANT PARITY OF PURCHASING POWER (PPP), KG IN AN OIL EQUIVALENT ON PPS FOR $СШA IN THE PRICES OF 2005. DATA ON THE LEADING COUNTRIES ON THE ECONOMY SIZE IN 2015 (the chart is made by the author on the basis of data: Statistical year-book of world power of 2014// Enerdata. – URL: https://yearbook.enerdata.ru/#energy-intensity-GDP-by-region.html)
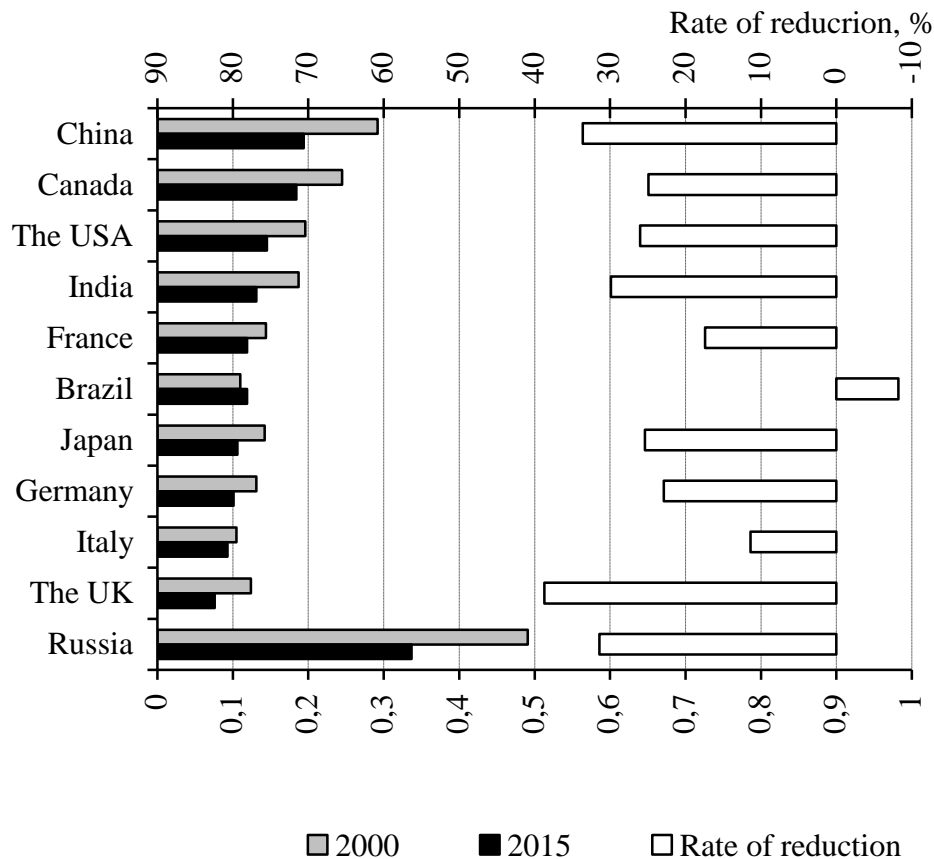
From the chart it is visible that the highest power consumption of GDP from among the presented countries is observed in Russia. So, in Russia in 2015 for production of 1 US dollar it was spent the fuel and energy resources (FER) by weight 0,337kg in an oil equivalent. It is more than indicators of power consumption of member countries of BRICS (is 75% more, than in China, and 2,5 times more, than in India and Brazil). In addition, the level of power consumption of production of GDP in Russia considerably exceeds indicators in developed countries. So, intensity of use of FER in economy of the USA is twice lower, and intensity of use of FER in the remained countries with developed economy is 2,5-3 times lower.

Meanwhile, fair will be to note that in Russia during the period from 2000 to 2015 were observed one their highest rates of reduction of power consumption of production. In particular, intensity of use of fuel and energy resources counting on GDP unit at par of consumer ability in the prices of 2005 was reduced from 0,491 to 0,337 kg of FER in an oil equivalent or for 31,4%. At the same time mostly the countries with developed economy rate of reduction of power

consumption of GDP for the considered years made 20-25% (11,4% – in Italy, 38,7% – in Great Britain). Rate of reduction of power consumption of GDP in China and India made 33,6% and 29,9%, respectively. Brazil was the only country in which power consumption of GDP increased – the gain made 8,2%.

In general the presented figures allow to claim that despite high rates of reduction of power consumption in Russia, intensity of use of fuel and energy resources in national economy still remains to one of the highest that affects efficiency of national productions adversely, including and industrial. This circumstance obliges to carrying out deeper analysis of questions of power consumption of the Russian industry.

Table 1
DATA ON USE OF THE ENERGY RESOURCES, PRODUCTION OF GROSS VALUE ADDED AND AVERAGE ANNUAL NUMBER OCCUPIED IN SECTORS OF THE INDUSTRY AND ECONOMY IN GENERAL *

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Use of energy resources on final consumption, mln.										
Mining	80,3	90,8	92,0	80,3	81,8	82,2	88,6	81,9	77,4	…
The processing productions	415,1	410,2	411,1	390,7	417,8	429,3	417,9	412,0	283,6	…
Production and distribution of the electric power, gas and water	49,3	47,3	52,7	60,1	64,9	67,1	65,1	62,1	58,5	…
In general on economy	1107,9	1119,3	1134,0	1084,2	1139,0	1174,4	1142,8	1142,1	885,3	…
Gross value added, in the comparable prices (2006), bln. rubles.										
Mining	2509,4	2518,0	2446,0	2106,6	2456,7	2712,7	2866,4	2832,9	2808,8	2990,9
The processing productions	4116,0	4415,8	4590,2	3654,3	3794,1	3767,6	3951,3	4051,0	4198,0	4336,2
Production and distribution of the electric power, gas and water	727,0	752,1	770,0	1013,9	976,3	956,3	913,1	939,9	889,4	854,7
In general on economy	22977,3	25030,3	26200,2	24699,8	25597,9	28407,4	29664,9	30205,5	30840,3	30629,8
Average annual number occupied in economy, thousand people										
Mining	1113	1118	1117	1063	1054	1062	1080	1075	1064	1082
The processing productions	11463	11422	11217	10401	10260	10272	10170	10065	9872	9844
Production and distribution of the electric power, gas and water	1921	1914	1911	1927	1941	1950	1947	1936	1914	1923
In general on economy	67047	67922	68397	67418	67493	67644	67968	67901	67813	68389

* the table is made by the author on the basis of data: Industrial production//Federal State Statistics Service. – URL: http://www.gks.ru/free_doc/new_site/business/prom/en_balans.htm; National accounts//Federal State Statistics Service.– URL:

http://www.gks.ru/free_doc/new_site/vvp/vvp-god/tab10.htm;   Manpower//Federal   State
Statistics Service. – URL: http://www.gks.ru/free_doc/new_site/population/trud/05-05.xls

Information on use of fuel and energy resources on final consumption, production of
gross value added, and also average annual number occupied in sectors of the industry and
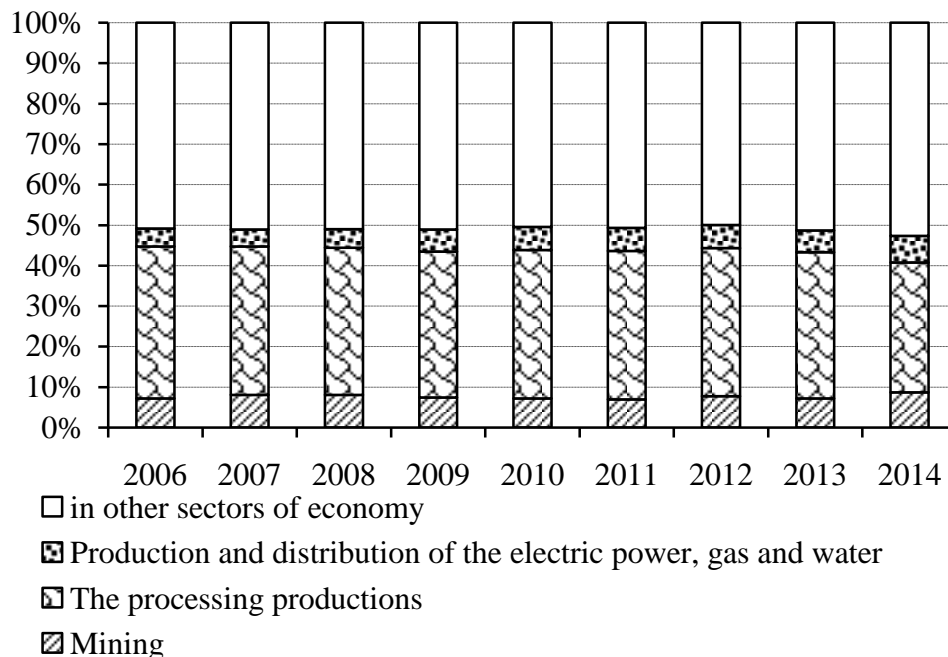economy in general is provided in table 1. Data are submitted from 2006 for 2015 and are used
for carrying out the further analysis connected with a research of power consumption of
industrial productions in domestic economy and its change for the considered period.

Figure 2
**DISTRIBUTION OF TOTAL AMOUNT OF THE CONSUMED FUEL AND ENERGY RESOURCES BY
SECTORS OF THE INDUSTRY AND OTHER SECTORS OF NATIONAL ECONOMY (the chart is
calculated and made by the author on the basis of data: Industrial production//Federal State Statistics
Service.– URL: http://www.gks.ru/free_doc/new_site/business/prom/en_balans.htm)**

☐ in other sectors of economy

⊠ Production and distribution of the electric power, gas and water

⊡ The processing productions

⊠ Mining

.

In the figure 2 the chart illustrating distribution of total amount of the consumed fuel and
energy resources by sectors of the industry and other sectors of national economy is submitted.
The analysis of the chart allows to note what nearly a half of total amount of the fuel and energy
resources used in economy of Russia for final consumption during the period from 2006 to 2014
was used in industries. And mostly this volume was used in the sphere of the processing
productions – 32,0-37,5% of the total volume of the fuel and energy resources used in economy
of Russia for final consumption. From 7,0 to 8,7% of the total volume of fuel and energy
resources were used in the sphere of mining, and in the sphere production and distribution of the
electric power, gas and water – 4,2-6,6% of the total volume of fuel and energy resources. As it
is possible to see from the chart, special changes in structure of use of fuel and energy resources

on final consumption by sectors of the industry and other sectors of national economy for the considered period of time were not observed.

3.2 The analysis of dynamics of change of volumes of consumption of fuel and energy resources by sectors of the industry and national economy in general

In the figure 3 the schedules illustrating dynamics of change of volumes of consumption of fuel and energy resources by sectors of the industry and national economy in general are submitted. The analysis of schedules allows to note that in general on economy of Russia during the period from 2006 to 2013 the volume of consumption of fuel and energy resources increased by 3,1%, and in 2014, against the background of adverse macroeconomic conditions, was reduced by 20,1%. At the same time the volume of consumption of fuel and energy resources in the processing sector of the national industry the main consumer of fuel and energy resources in the industrial sphere – by 2013 was reduced by 0,7%, and in 2014 – for 31,7%.

Figure 3
DYNAMICS OF CHANGE OF VOLUMES OF CONSUMPTION OF FUEL AND ENERGY RESOURCES BY SECTORS OF THE INDUSTRY AND NATIONAL ECONOMY IN GENERAL (schedules are calculated and constructed by the author on the basis of data: Industrial production//Federal State Statistics Service. – URL: http://www.gks.ru/free_doc/new_site/business/prom/en_balans.htm)
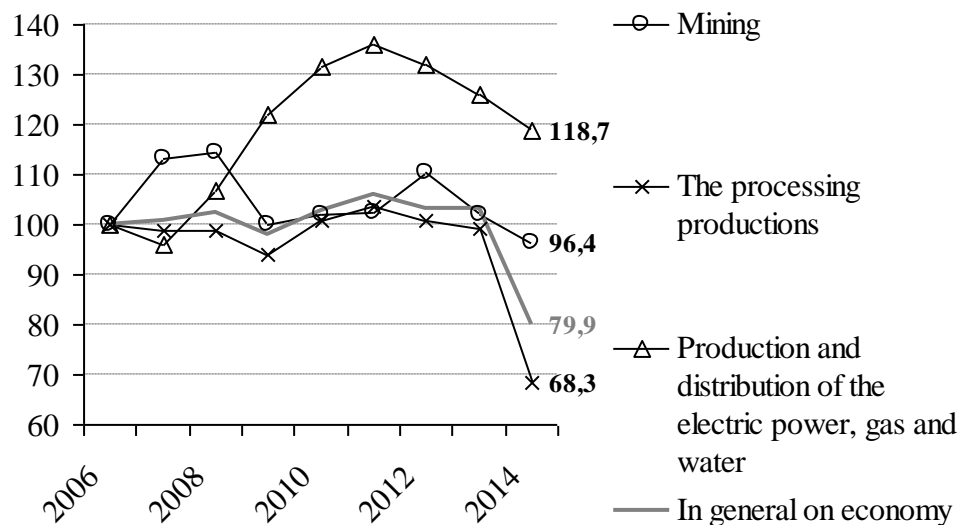

In sector of mining industry the volume of consumption of the fuel and energy resources intended for end use by 2013 increased by 2,0%, and by 2014 was reduced by 3,6%. In sector of the generating industry the volume of consumption of fuel and energy resources by 2013 increased by 26,0%, but was a little corrected in 2014, as a result growth rate made 118,7%.

In the figure 4 the chart illustrating structure of consumption of fuel and energy resources on their types and sectors of the industry and economy in general in 2006 and 2014 is submitted.

Figure 4
STRUCTURE OF CONSUMPTION OF FUEL AND ENERGY RESOURCES ON THEIR TYPES AND SECTORS OF THE INDUSTRY AND ECONOMY IN GENERAL IN 2006 AND 2014 (the chart is calculated and made by the author on the basis of data: Industrial production//Federal State Statistics Service.– URL: http://www.gks.ru/free_doc/new_site/business/prom/en_balans.htm)
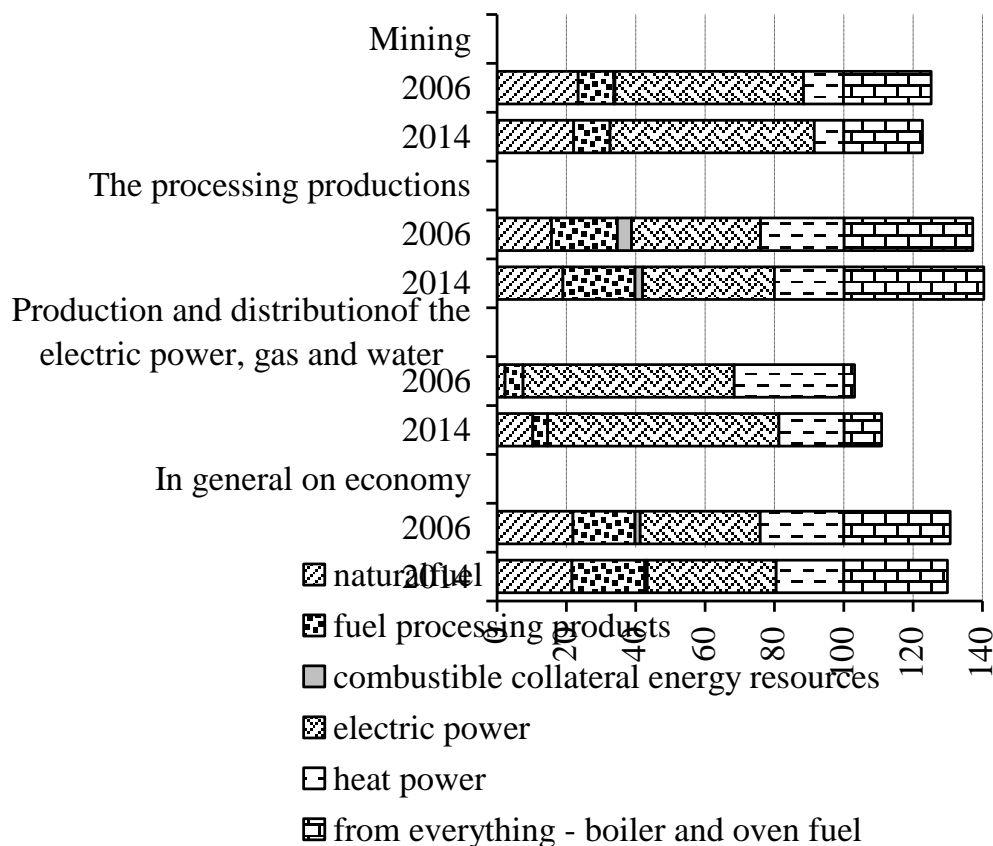
From the chart it is visible that in general on economy the main volume of consumption (34,6-37,2%) fell on the electric power. From 19,5 to 24,1% in various years were the share of thermal energy, and also of natural fuel. Another 17,9-21,0% were the share of fuel processing products. Absolutely insignificant quantity – 0,7-1,5% was the share of combustible collateral energy resources. From all volume of fuel and energy resources about 30% were the share of boiler and oven fuel. At the same time for the considered years of special changes in structure of consumption of fuel and energy resources on their types in general on economy it was not observed.

In the sphere of the extracting productions the main volume of consumption of fuel and energy resources slightly more than a half (54,4-58,9%) fell on the electric power. Another 22,1-23,4% were the share of consumption of natural fuel. About on 10% it was the share of consumption of products of processing of fuel and thermal energy. And volumes of consumption of combustible collateral energy resources were almost equal to zero. From all volume of fuel and energy resources about 20-25% were the share of boiler and oven fuel. At the same time for the considered years in the sphere of the processing productions in structure of consumption of fuel and energy resources on their type there were minor changes within 0,5-5,0%.

In the sphere of the processing productions the main volume of consumption of fuel and energy resources also fell on the electric power (37,2-38,0%). From 20,1% to 24,1% it was the share of thermal energy. On 15-20% it was the share of natural fuel and products of processing of fuel. Absolutely insignificant number of 2,2-4,3% were the share of combustible collateral energy resources. From all volume of fuel and energy resources about 40% were the share of boiler and oven fuel. Apparently from the chart, for the considered years in the sphere of the processing productions in structure of consumption of fuel and energy resources on their type there were minor changes – within 0,5-5,0%.

In the sphere of the generating productions the main volume of consumption of fuel and energy resources – about 2/3 (60,9-66,7%) – fell on the electric power. Another 18,8-31,6% were the share of consumption of thermal energy. On 5-10% it was the share of consumption of natural fuel and products of processing of fuel, and volumes of consumption of combustible collateral energy resources were close to zero. From all volume of fuel and energy resources about 3-10% were the share of boiler and oven fuel. And, apparently from the chart, for the considered years in the sphere of the extracting productions in structure of consumption of fuel and energy resources on their type there were some changes the share of natural and boiler and oven fuel increased and the heat power share was reduced.

Figure 5
VOLUMES OF CONSUMPTION OF FUEL AND ENERGY RESOURCES ON THEIR TYPES IN GENERAL ON ECONOMY IN 2006 AND 2014, ONE MILLION (the chart is calculated and made by the author on the basis of data: Industrial production//Federal State Statistics Service. – URL: http://www.gks.ru/free_doc/new_site/business/prom/en_balans.htm)
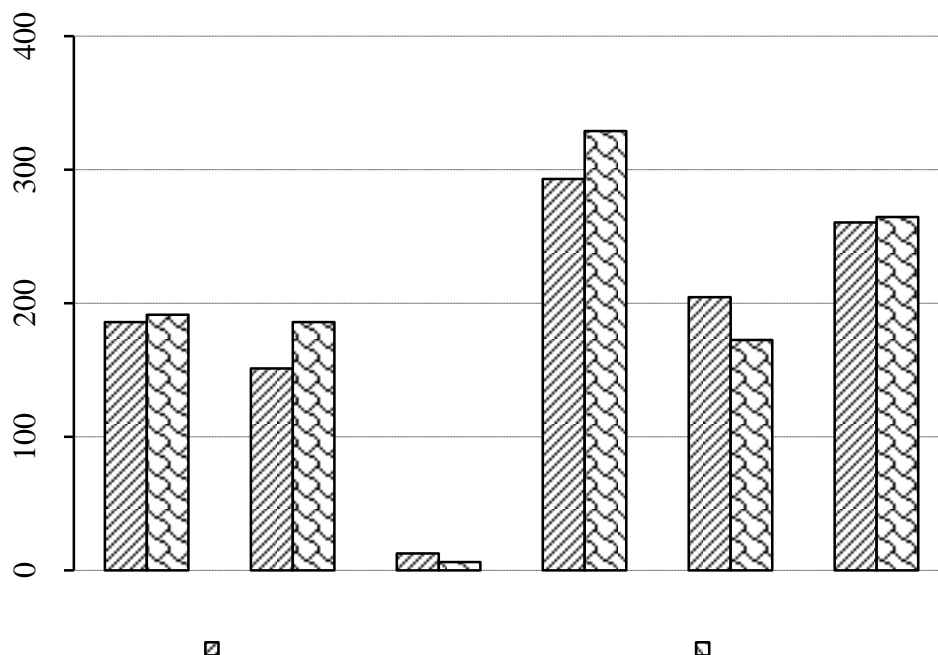
At the same time the happened changes were not reflected essentially in structure and volumes of consumption of fuel and energy resources in general on economy of Russia what it was already told about. So, on the chart in the figure 5 information on volumes of consumption of fuel and energy resources on their types in general on economy in 2006 and 2014 is provided.

From the chart it is visible that consumption of products of processing of fuel increased by 22,9% – from 151,35 million   in 2006 to 186,0 million   in 2014. Electricity consumption increased by 12,3% – from 293,0 million   in 2006 to 329,0 million in 2014. Consumption of natural fuel increased by 3,0% – from 186,0 million   in 2006 to 191,5 million in 2014. Consumption of boiler and oven fuel increased by 1,6% – from 260,5 million in 2006 to 264,7 million in 2014. Consumption of thermal energy was reduced by 15,6% – from 204,5 million in 2006 to 172,5 million in 2014. Consumption of combustible collateral energy resources was reduced by 50,0% – from 12,6 million   in 2006 to 6,2 million   in 2014. And on the general background so considerable reduction remained almost imperceptible that initially the share of combustible collateral energy resources in the general structure of the fuel and energy resources used for final consumption was insignificant.

In general it is possible to note a growth in volumes of consumption of fuel and energy resources practically on all their types within 4-15%. Spheres of thermal energy where reduction of volumes of consumption for 16,5%, and also consumption of combustible collateral energy resources was observed became an exception only. And this process takes place against the background of lack of essential changes in structure of consumption of fuel and energy resources on their type that gives to this sphere certain characteristics of inertness.

3.3 Calculation of indicators of power consumption of gross value added for sectors of the industry and national economy in general

On the basis of data from table 1 we will make calculation of indicators of power consumption of gross value added for sectors of the industry and national economy in general, and also we will calculate indicators of change of power consumption from 2006 for 2014 (table 2). The indicator of power consumption of the gross value added (GVA) pays off as the relation of volume of the fuel and energy resources used on final consumption to the volume of the created gross value added by sectors of the industry and economy in general.

Table 2
CALCULATION OF INDICATORS OF POWER CONSUMPTION OF GROSS VALUE ADDED BY SECTORS OF THE INDUSTRY AND NATIONAL ECONOMY IN GENERAL, AND INDICATORS OF ITS CHANGE *

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Power consumption of GVA, kg for 1000 rub of GVAS, in the prices of 2006									
Mining	32,0	36,1	37,6	38,1	33,3	30,3	30,9	28,9	27,6
The processing productions	100,9	92,9	89,6	106,9	110,1	113,9	105,8	101,7	67,6
Production and distribution of the electric power, gas and water	67,8	62,9	68,4	59,3	66,5	70,2	71,3	66,1	65,8
In general on	48,2	44,7	43,3	43,9	44,5	41,3	38,5	37,8	28,7

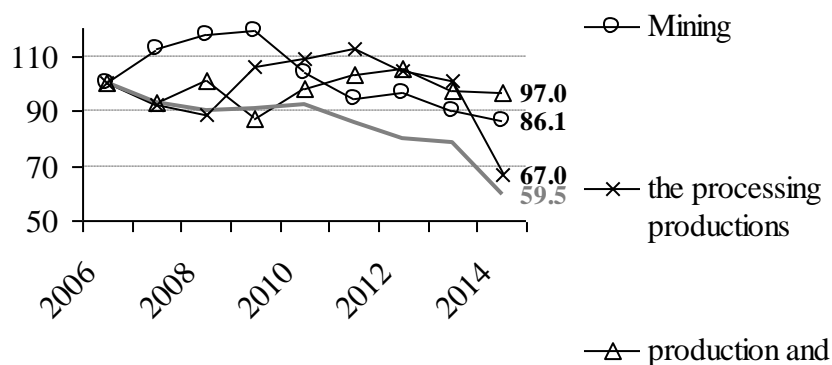| economy								
Growth rates, in % by basic year								
Mining	100,0	112,7	117,5	119,1	104,1	94,7	96,6	90,3	86,1
The processing productions	100,0	92,1	88,8	106,0	109,2	113,0	104,9	100,8	67,0
Production and distribution of the electric power, gas and water	100,0	92,7	100,9	87,4	98,0	103,5	105,1	97,4	97,0
In general on economy	100,0	92,7	89,8	91,0	92,3	85,7	79,9	78,4	59,5

* the table is calculated and made by the author on the basis of data: Industrial production//Federal State Statistics Service. – URL: http://www.gks.ru/free_doc/new_site/business/prom/en_balans.htm; National accounts//Federal State Statistics Service.– URL: http://www.gks.ru/free_doc/ new_site/vvp/tab10.xls

From the table it is visible what in general on economy in 2014 for creation of the new value added for 1000 rub expressed in the prices of 2006 needed to be spent fuel and energy resources in volume of 28,7 kg (37,8 kg in 2013). In sector of mining this indicator was significantly lower – 27,6 kg (28,9 kg in 2013) for 1000 rub of GVA. In sector of production and distribution of the electric power of gas and water – 65,7 kg (65,8 kg in 2013) for 1000 rub of GVA. The sector of the processing productions – 68,6 кг.у.т was the most power-intensive. (101,7 kg in 2013) for 1000 rub of DVA that is almost twice more than an indicator in general on economy.

Figure 6
GROWTH RATES OF POWER CONSUMPTION OF GROSS VALUE ADDED BY SECTORS OF THE INDUSTRY AND NATIONAL ECONOMY IN GENERAL, IN % BY BASIC YEAR, IN THE PRICES OF 2006 (schedules are calculated and constructed by the author on the basis of data: Industrial production//Federal State Statistics Service. – URL: http://www.gks.ru/free_doc/new_site/business/prom/en_balans.htm; National accounts//Federal State Statistics Service. – URL: http://www.gks.ru/free_doc/new_site/vvp/tab10.xls)

Dynamics of change of indicators of power consumption of gross value added by sectors of the industry and national economy in general is presented by means of schedules in the figure 6. The analysis of schedules allows to note that power consumption for the considered years was reduced both in general on economy, and in particular by separate sectors of the industry. At the

same time during the period from 2006 to 2014 power consumption of gross value added in general on economy was reduced by 40,5% (21,6% as of 2013). Power consumption of the gross value added made in sector of processing industry – was also significantly reduced by 33,0% (or increased by 0,8% as of 2013). Power consumption of the gross value added made in sector of processing industry was reduced by 13,9% (9,7% as of 2013). Unlike it power consumption of gross value added in sector of the generating industry was left practically without changes – reduction for 3,0% (2,6% as of 2013).

The presented figures allow to say that the most power-consuming industries are productions in the processing sphere of the industry. The main share in the total amount of consumption of fuel and energy resources in national economy also is the share of these productions. And intensity of use of fuel and energy resources in this sector of the domestic industry practically did not change in recent years since neither volumes of consumption of FER, nor volumes of development of GVA practically changed. Only 2014 when there was a sharp reduction of prices of oil, being raw materials for many branches of processing industry became an exception. However this change has no fundamental character. The sector of mining became the only sector of the industry where real decrease in power consumption of production during the period from 2006 to 2014 was observed. Here intensity of use was reduced by final consumption of fuel and energy resources in many respects owing to increase in production of gross value added at preservation of volumes of consumption of energy. In sector of the generating industry the level of power consumption of production for the considered years practically did not change. At the same time the parallel growth in volumes of final consumption of fuel and energy resources and production of gross value added was observed here.

Table 3
CALCULATION OF INDICATORS OF POWER CONSUMPTION OF WORK FOR SECTORS OF THE INDUSTRY AND NATIONAL ECONOMY IN GENERAL, AND INDICATORS OF ITS CHANGE *

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Power consumption of work, on 1 occupied in economy									
Mining	72,1	81,2	82,4	75,5	77,6	77,4	82,0	76,2	72,7
The processing productions	36,2	35,9	36,6	37,6	40,7	41,8	41,1	40,9	28,7
Production and distribution of the electric power, gas and water	25,7	24,7	27,6	31,2	33,4	34,4	33,4	32,1	30,6
In general on economy	16,5	16,5	16,6	16,1	16,9	17,4	16,8	16,8	13,1
Growth rates, in % by basic year									
Mining	100,0	112,6	114,2	104,7	107,6	107,3	113,7	105,6	100,8
The processing productions	100,0	99,2	101,2	103,7	112,5	115,4	113,5	113,0	79,3
Production and distribution of the electric power, gas and water	100,0	96,3	107,5	121,5	130,3	134,1	130,3	125,0	119,1
In general on economy	100,0	99,7	100,3	97,3	102,1	105,1	101,8	101,8	79,0

* the table is calculated and made by the author on the basis of data: Industrial production//Federal State Statistics Service. – URL: http://www.gks.ru/free_doc/new_site/business/prom/en_balans.htm; Manpower//Federal State Statistics Service. – URL: http://www.gks.ru/free_doc/new_site/population/trud/trud2.xls
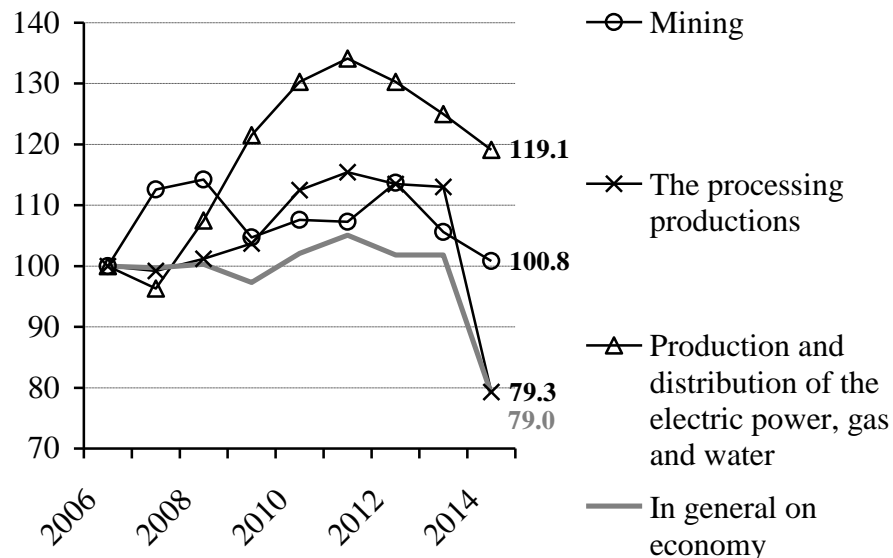
Summing up the result and aggregating the received facts, it is possible to claim that process of consumption of fuel and energy resources in the Russian industry is in a stage of the inertial growth. In many respects it is a consequence of preservation of level of intensity of use of FER by his main consumer – processing industry, despite positive dynamics in the sphere of the extracting productions (against the background of the advancing increase in production of GVA at preservation of volumes of consumption of FER), and also in the sphere of the generating industry (against the background of parallel accumulation of volumes of consumption of FER and the outputs).

Also on the basis of data from table 1 we will make calculation of indicators of power consumption of work for sectors of the industry and national economy in general and we will calculate indicators of change of power consumption from 2006 for 2014 (table 3). The indicator of power consumption of work pays off as the relation of volume of the fuel and energy resources used on final consumption, to number occupied by sectors of the industry and economy in general. From the table it is visible what in general on economy in 2014 counting on 1 worker was consumed 13,1 (16,8 in 2013). In sector of production and distribution of the electric power, gas and water this indicator was 2,5 times higher – 30,6   (32,1   in 2013) counting on 1 worker. In sector of the processing productions – is twice higher – 28,7 (40,9 in 2013) counting on 1 worker. The most power-intensive work was work in the extracting industry sector – 5,5 times higher than an indicator in general on economy – 76,2   (72,7   in 2013) counting on 1 worker.

Dynamics of change of indicators of power consumption of work by sectors of the industry and national economy in general is presented by means of schedules in the figure 7.

Figure 7
GROWTH RATES OF POWER CONSUMPTION OF WORK BY SECTORS OF THE INDUSTRY AND NATIONAL ECONOMY IN GENERAL, IN % BY BASIC YEAR, IN THE PRICES OF 2006 (schedules are calculated and constructed by the author on the basis of data: Industrial production//Federal State Statistics Service. – URL: http://www.gks.ru/free_doc/new_site/business/prom/en_balans.htm; Manpower//Federal State Statistics Service.– URL: http://www.gks.ru/free_doc/new_site/population/trud/trud2.xls)

The analysis of schedules allows to note that power consumption for the considered years was practically not reduced both in general on economy, and in particular by separate sectors of the industry. So, from 2006 for 2014 power consumption of work in general on economy was reduced by 21,0% (increased by 2,0% during the period from 2006 to 2013). In sector of processing industry power consumption was reduced by 20,7% (though the previous year the gain made 13,0%). In sector of mining industry power consumption increased by 0,8% (for 5,6% during the period from 2006 to 2013). And in sector of the generating industry increased by 19,1% (for 25,0% during the period from 2006 to 2013).

RESULTS

The obtained data allow to say that in the domestic industry the positive changes in a question of power consumption of work carrying fundamental, but not tactical character are not observed. So, by all sectors of industrial productions considerable excess of an average on economy of level of power consumption of work is observed. It is natural since in the industry work of the person is closely connected with the operation of machines and the other equipment consuming a large number of fuel and energy resources (Strizhakova, 2014). However against the background of preservation of number occupied and growth of volumes of consumption of fuel and energy resources in sector of the generating productions, and also against the background of decrease in number occupied and preservations of volumes of consumption of fuel and energy resources in sector of the processing productions, it is possible to claim that the

bigger attention in questions of increase in efficiency of the domestic industry is paid to reduction of number occupied, than to decrease in intensity and optimization of consumption of fuel and energy resources.

Thus, the carried-out analysis shows that realization of a problem of the advancing social and economic development is under the threat now. The main source of this threat are a certain sort stagnant processes in the national industry. In particular, it is about low production efficiency in industrial sector of national economy. Even in spite of the fact that efficiency of the Russian industry increased the advancing rates in relation to indicators of the developed and developing states in the last decade partners in BRICS, in absolute expression lag of the domestic industry from the industry of developed countries remains rather big.

CONCLUSION

In general, as it was found out above, one of the main reasons constraining increase in efficiency of industrial production in Russia is high power consumption. Even despite the highest rates of reduction of power consumption in Russia over the leading countries by the GDP size in 2015, intensity of use of fuel and energy resources in national economy still remains to one of the highest. Besides, it is promoted by preservation of inertial nature of growth of process of consumption of fuel and energy resources in the Russian industry, especially thanks to preservation of level of intensity of their use by the main consumer – processing industry. Also in the domestic industry positive changes in a question of high power consumption of work are not observed that in total affects indicators of labor productivity and capital productivity adversely.

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THE INSTITUTIONAL ASPECT OF PUBLIC-PRIVATE PARTNERSHIP MECHANISM IMPROVEMENT

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ABSTRACT

The article deals with the problems of public-private partnership (PPP) institutional system, the solution of which will contribute to the rationalization of the interaction between government and business, which makes a direct impact on production efficiency improvement and the rate of a country economic growth.

Keywords: public-private partnership, formal and informal institutions, Vnesheconombank, Investment fund, infrastructure projects, power, risks.

INTRODUCTION

The development of new economy with a competitive industry and infrastructure, operated on the basis of a modern technological base, highlights more intensely such an important issue as the ratio of two processes for an agenda: the institutional reforms and the development of public-private partnership. The fact is that the nature of the interaction between a state and business is also a dynamic and changeable in its development as the institutional process of the existence form of the latter. Experience shows, that they are determined by a constant update of property relations. At that it is important to note that the institutional changes make an effective impact on PPP only if the performed institutional reforms are carried out in the organic relationship with the society needs. If such changes do not take place, then no institutional changes will lead to a positive result.

Modern Western economists due to more extensive and more prolonged experience of cooperation between a state and private business in Russia, studied in detail the institutional problems and their influence on the development of innovative relations as well as the relations developing in a public-private partnership. The works of the following authors are devoted to the research of these issues: Cheung E. (Cheung and Chan, 2014), Cooke P. (Cooke, 2013), Urbančíková, N. (Urbancikova and Burger, 2014).

Such researches as Hagland M. (Hagland, 2012), Javed, A.A. (Javed et al., 2014), Ke Y. (IJPM, 2010) studied the theoretical and practical aspects of PPP tool development and functioning, its specific features, the forms and the methods of organization.

The organization issues of PPP project financing are reflected in the works written by Dhewanto, W. (Dhewanto et al., 2015), Kort, M. (Kort and Klijn 2013), Lorenzini, E. (Lorenzini, 2014).

Besides, a significant contribution to the development of cooperation theory and methodology between a state and business structures was made by such foreign scholars as Cruz,

C.O. (Cruz and Marques, 2014), Pattberg, P. (Pattberg et al., 2012), Tang, L. (Tang et al., 2010), Tsertseil, J.S. (Tsertseil, 2015).

THEORY

The institutional environment of interaction between a state and business includes the entire set of formal and informal institutions that provide the coordination of entity economic activities. Without the consideration of the institutional environment it is impossible to define the major trends of public-private partnership development, as well as the guidelines, on the basis of which the development and the selection of the most effective economic and social institutions takes place.

New institutions appear and old institutions disappear during the innovative economy development. The improvement of entire institutional environment takes place gradually. This is true as for formal so as for informal institutions.

However, in terms of institutional reforms in PPP such factor as the public authority efficiency is an important one. Weak power, affected by bureaucracy corruption is one of the main barriers for the creation of an effective interaction mechanism between a state and business. It follows that a state must actively influence the institutional environment of PPP.

It should be noted that several types of organizational structures appear during the work with PPP projects in the last ten years. This suggests that there is no only one preferred option. One may define three types of control and regulatory bodies and the institutions in the fields of industrial infrastructure, which deal with PPP issues in the countries with a developed economy:

– ministries and their structures;

- Autonomous regulatory agencies separated from the ministry (making decisions or advisory ones);

- Independent agencies.

For example, in the UK this system includes the following bodies: Partnerships UK, the Advisory Council, Partnerships UK Board, Audit Committee and the National Audit Office or the relevant supervisory agencies of Scotland, Wales and Northern Ireland. There are differences in other countries. However, regardless of the fact of such a structure creation with the coordinating ministry or as an independent organization, it works closely with the Ministry of Finance or Economy, which is responsible for a project approval. (http://europeandcis.undp.org/uploads/public/file/PPP%20Report_2007_Russian%20version.pdf)

After the analysis of public-private partnership institutions available in our country, we came to the conclusion that the most effective scheme of PPP hierarchical management for the Russian economy could be the following one (fig.1).

Let's take a closer look at some agencies from the presented structure. Among PPP institutes a significant role is played by Vnesheconombank, which is one of the key institutions for the state investment policy system development, which allows to implement the investment projects using PPP principles. Its function is the provision of project financing that are unattractive for private financing due to low profitability, high risks or long-term implementation.

Figure 1
PRIVATE-PUBLIC PARTNERSHIP INSTITUTIONS
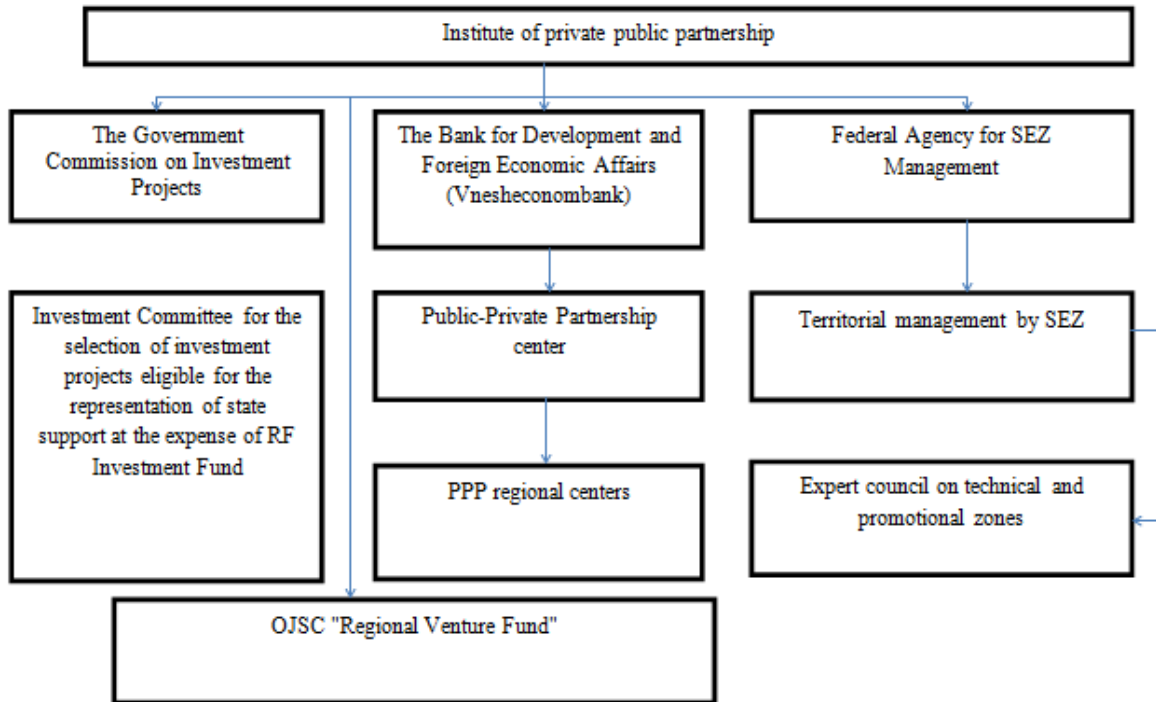
An absolutely new tool of an active public investment policy aimed at the economy growth and diversification is the Russian Federation Investment Fund (RF IF) for investment project co-financing. Since the Fund operates according to the project principle of financing, it is the most effective source of budget investment as compared to the federal target and federal programs of regional development.

Strict criteria are used during the selection of funding projects from IF. The projects should be strategically important and have positive social effects. Besides, it is necessary to prove that the project can not be realized without a state support (Table 1). (Seleznev, 2010)

Table 1
STATE SUPPORT PROVISION TERMS FROM RUSSIAN FEDERATION INVESTMENT FUND

Document composition requirements	Qualitative criteria for selection	Quantitative criteria for selection
Final report from RF General Board of State Expert Review	Private investor availability	Financial efficiency: NPV>0, IRR>WACC
а) Profile ministry report б) Investment consultant report	а) project strategic importance; б) the availability of positive social effects;	Budget efficiency: PIB>1

	в) the impossibility of a project implementation without a state support	
Total amount of documents: about 30 names	Project cost: - for federal - >>5 billion rub.; - for regional - >>500 mln. rub.; - an investment consultant positive report	Economic efficiency: ЭТ>0,01%

Until now they considered that this PPP instrument is the most elaborated one as compared to other instruments from a normative point of view corresponding to Russian PPP concept. However, there are different points of view in this respect. Nowadays PPP Institute is in conflict with the Budget, Urban Development and Tax Code and with land legislation. "Vegas-Lex" company lawyers estimated that this mechanism will work if the amendments to 124 legislation acts are introduced. Nowadays, there is the mixture of diverse functions within a single PPP Institute. At that this funding structure continues to become more complex. For example, the Russian Venture Company, the Russian investment fund of information and communication technologies, etc. are financed through the Investment Fund.

Nowadays a clear distribution of funding functions through various PPP instruments is necessary first of all (Investment Fund - only infrastructure projects, the Development Bank - scale investment projects with an inssuficient commercial appeal and a guarantee against political risks, the Russian Venture Company, the Russian investment fund of information and communication technologies, the Russian Corporation of nanotechnologies, industrial parks, etc.).

Nowadays the picture is quite different one. This is evidenced by the comparative participation of Vnesheconombank and RF IF in the implementation of transport infrastructure projects (based on the project original cost) (Table 2).

Table 2
THE PARTICIPATION OF VNESHECONOMBANK AND INVESTMENT FUND IN THE IMPLEMENTATION OF TRANSPORT INFRASTRUCTURE PROJECTS (BASED ON THE ORIGINAL PROJECT COST), BLN. RUB.

PPP object	VEB	IF	Total cost of the project (provided financing in brackets)	% of VEB participation
Construction of a new exit on the Moscow Ring Road, Federal motorway M1 Moscow-Minsk	17,3	21,9	37,9 (39,2)	45,6
Construction of the highway Moscow - St. Petersburg (15-58 km)	54,9	48,6	104,6 (103,5)	52,5
Construction of railway line Elegest-	125,0	49,3	131,6 (174,3)	95,0

Kyzyl-Kuragino in the Republic of Tuva				
The development of industrial production in Lower Angara Region	213,9	62,7	387,7 (276,6)	55,2

Table 2 shows that the share of Vnesheconombank financing for all PPP projects, except for the construction of a new exit on the Moscow Ring Road M1 Moscow-Minsk Federal highway, is a decisive one, and in the case of the railway line Elegest-Kyzyl-Kuragino construction in the Republic of Tuva it makes about 95,0% of the total project cost. This applies to the funding in comparison with IF, and with the total value of projects.

Moreover, according to the results of PPP project financing analysis it becomes apparent that the other project parties do not to carry out their obligations or implement them partially. On this basis, we believe that the part of IF functions for the conduct of the largest PPP projects should be transferred to Vnesheconombank. As for the IF, it can be reformatted in the direction of greater interaction with regional authorities, as well as with regional businesses.

CONCLUSION

Thus, having considered the foreign and domestic institutional structure of PPP, we can conclude that two schemes of PPP mechanism regulation are possible in Russia. We propose the creation of a federal executive body as the first version such as PPP Project Central Management, the composition of which assumes the operation of input information analysis departments, the monitoring of innovation operation of enterprises and a department depending on a project implementation sector, or a special body under the Russian Federation Government, for example, the federal PPP fund responsible for the implementation of PPP projects.

When this department is be created, it will be possible to estimate reliably the risk degree, which PPP is ready to accept, the proper management of these risks, their readiness to accept such risks, to determine the assessment criteria of PPP viability, and its policy with regard to the participation of interested parties.

The second option involves the adaptation of the existing control system by industrial infrastructure objects, giving it additional powers, for example, by the organization of special PPP committees within the relevant ministries. This special body may be the Committee concerning the control and the implementation of PPP projects, which should be included in the Ministry of Regional Development.

Besides, in our opinion, it is necessary to use foreign experience to create a separate independent company, which will carry out the assessment and the control of risks at each stage of PPP project implementation. The powers of this body should include the "freezing" of payment at the non-compliance of any participant obligations. Naturally, he should operate on the basis of a legal framework.

It would be reasonable to develop a program of PPP development for public authorities as an integral part of social-economic development program in the long term.

Nowadays the variety of PPP forms is really designated in Russia, but it does not work as the system, systematically covering the single economic space of the country, the partnership is not operated for now. Accordingly, the fundamental changes of PPP the PPP mechanism control system are required, namely the creation of a single body for PPP issues, the functions and the

responsibilities of which must meet the objectives and terms of economy modernization, as well as the development of an appropriate institutional environment, which includes economic instruments and incentives which create the conditions for development of various PPP forms and models.

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COMPETITIVE ADVANTAGE FORMULATION STRATEGY FOR RUSSIAN DAIRY INDUSTRY UNDER ECONOMIC CRISIS AND SANCTIONS

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ABSTRACT

The article actualizes the need of competitive advantage development in Russian dairy industry within the conditions of import substitution. The scientific analysis of RF dairy industry current state is carried out. The results of economic sanction and product embargo introduction and the response product embargo are analyzed, the forward-looking assessment of milk and milk product market development on the basis of the sector main trend revealing in difficult social and economic conditions. The dynamics of prices for dairy products and its impact on the living standards of Russian consumers during the economic crisis are analyzed. They disclose the main problems that preventing the formation of long-term competitive advantages in Russian dairy industry and an advisory system of optimization measures is proposed in order to increase the dairy industry competitiveness.

Keyword: competitive advantages, Russian dairy industry, dairy product production, import substitution, economic crisis, sanctions, product embargo, loss of purchasing power, the increase of prices.

INTRODUCTION

Dairy industry is a key one for agricultural sector of Russia and the production and processing of milk is one of the leading sectors in food industry. It is strategically important for the economy and population of the country: more than 21 thousand companies are operated in the industry and related fields, more than 1.2 million people are employed; industry products make up to 15% of retail network turnover. Milk is a socially significant product of paramount importance in the population nutrition. Milk and milk products are included in the list of products included in the doctrine of national food security. 1700 plants are operated in Russian dairy industry, where 200 thousand men work. At the end of 2015 Russia provided about 6% of the world production of raw milk (http://www./ mcx.ru/., Date of appeal 15.09.2016; www.souzmoloko.ru, Date of appeal 15.09.2016; htpp://www.rianovosti; Date of appeal 15.09.2016; www.dairynews.ru on 15/07/2016).

However, despite this significant potential the country dairy industry experiences a steady decline and is in a very difficult situation during recent years. This is explained by several factors: weak raw material and technical base, a narrow range of products, the unwillingness of companies to develop qualitatively new economic relations with the manufacturers of raw materials and trade organizations based on marketing relationship, as well as by increased

competition of imported products, the absence of state regulation effective forms concerning dairy industry (Berezin I.S., 2007; Vasilieva N.A., 2011).

DATA AND METHODS

Russian diary industry state analysis during economic crisis and sanctions

During the period of economic reforms which took place in the country, the dairy husbandry suffered the greatest losses among all areas of product subcomplex. The gross production of milk decreased by 23.7 million tons, or by 43%, the number of cows decreased by 7.8 million, or 37%, and the animal productivity per cow decreased by 449 kg, or 16% during the period from 2004 to 2013. Thus, the level of milk and dairy product consumption in terms of milk amounted to 218 kg in 2013. The level of population self-sufficiency by dairy products amounted to about 74-75% at 90% threshold of food security doctrine (Zaitseva T.N., Malova E.N., 2014).

Due to climatic conditions and the peculiarities of population settlement across the country the main zones of milk production in Russia are located very unevenly. There are significant differences in terms of gross production of milk between economic regions. The largest milk producers in the country remain the Urals, Central region, Volga region and West Siberian region. They account for 59% of the gross production of milk. At the end of 2015, the volume of raw milk production corresponds practically to the volumes of 2014: the farms of all categories produced 30781 tons of milk in January - December 2015, 30 791 tons were produced in 2014 during the same period (FGBNU VNIIESKH, 2015; Malova E.N., Avdyushina I.V., Bystrova A.A., Lapteva M.D., Hodakova E.E., 2015).

Regionally, the highest relative increase of production within all types of farms is recorded in the Republic of Ingushetia (+ 11.5%, up to 74.4 ths. tons), Kaluga region (+ 11.2%, up to 253.8 ths. tons) and Kaliningrad region (+8.8%, up to 170.0 thousand tons) as well as in Kirov (+ 6.8%, up to 578.8 ths. tons), Tula (+6.0%, up to 187.3 thousand t.), Vologda (+5.6%, up to 469.4 ths. tons), Primorye Territory (+ 4.3%, up to 123.7 ths. tons), Leningrad region (+ 3.7%, up to 588.7 ths. tons), the Republic of Dagestan (+ 3.6%, up to 820.2 ths. tons) and the Ivanovo region (+ 3.5%, up to 154.5 ths. tons).

Figure 1
RAW MILK PRODUCTION DYNAMICS AND STRUCTURE IN RUSSIAN FEDERATION. SOURCE: DAIRY INDUSTRY -2015 (REFERENCE BOOK). /COMPILED BY A.S. BELOV, A.A. VORONIN, M.E. ZHEBIT. M: NATIONAL UNION OF MILK PRODUCERS, 2016. P. 12
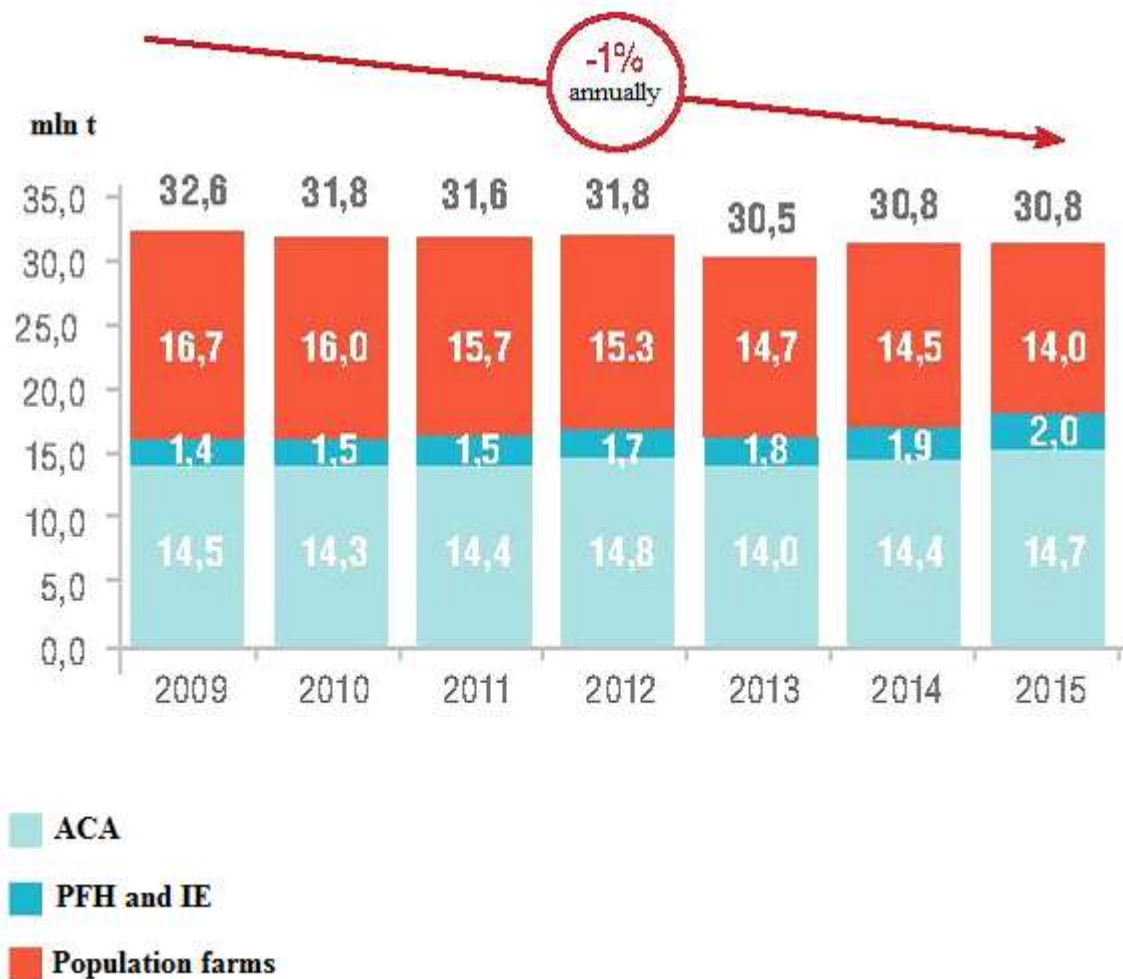
The positive fact is that the milk production increases in many leading regions within the terms of production, including the largest ones (the Republic of Bashkortostan, Tatarstan, Dagestan and Udmurtia, Krasnodar and Krasnoyarsk regions). The greatest decrease of production took place in 2015 (in relative terms) in the Republic of Crimea (-21.3%, up to 225.7 thous. tons), the Jewish Autonomous Region (-16.3%, up to 9.6 ths. tons), Kurgan (-15.9%, up to 252.6 ths. tons) and Murmansk (-13.4%, up to 19.1 ths. tons) regions, the Republic of Kalmykia (-10.5%, up to 78.8 ths. tons) and the Ulyanovsk region (-9.2%, up to 211.1 ths. tons).

Before the introduction of special economic measures a steady increase of demand for finished products was observed at the dairy market in August 2014 - 5-6% per year. At that the volume of raw material supply decreased steadily - the drop of milk production volumes made approximately 2 million tons for the last 7 years (Malova E.N., T.N. Zaitseva, Kurochkina T.I.,

2014). Thus, the deficit of raw milk took place at the market. The domestic production milk products (cheese, butter) reduced, which resulted in imports increase.

During the period from 2004 to 2013, the share of imports made 12-13% on the average of the total volume of produced commodity products sector and reached its maximum (16.1%) in 2009 (A.S. Belov, A.A. Voronin, M.E. Zhebit. M: The National Union of Milk Producers, 2016). Butter, milk powder, cheese and foods for infants were imported mainly. Thus, according to the Federal Customs Service of Russia, the volume of dairy product imports rose sharply in the first quarter as compared with the same period of 2013 and amounted to 80%, or $ 169.7 million, which makes 42.4 ths. tons in product equivalent (it is higher than the level of 2013 by 33%).

In total, the share of imported cheese and butter reached 50%, the share of milk powder reached 70% in 2013-2014 (Seyfullaeva M.E., 2016; Seyfullaeva M.E., M.G. Belenikina, 2016).

Before the introduction of retaliatory embargo for the supply of dairy products from the EU countries and the USA to Russia, the major importer of dairy products to the domestic market was the Republic of Belarus. The largest importers of milk in Russia during the pre-sanction period was also Finland (12.2 ths. tons), Estonia (5,8 ths. tons), Lithuania (2.4 ths. tons), Poland (2.4 ths. tons) and France (2.4 ths. tons). The remaining importers took no more than 8% of the total volume and supplied about 2,300 tons of dairy products. They were lost (25-27 ths. tons of milk in total) by the Russian market due to the imposition of sanctions. Due to the introduction of response embargo on the delivery from a number of countries by RF, the imports of dairy products decreased by 57% in August 2014 (Agrovestnik, 03.06.2016; Nikolaichuk V.E., Hamyadgaleeva V.I., 2016; Surovtsev V.N., Nikulina Yu.N., Payurova E.N., 2015).

At the end of 2015 the total import of milk and dairy products fell by 25% (it made 5985 thousand tons in milk equivalent or 1 772 million US dollars).

The regional structure of dairy products import changed significantly after the introduction of special economic measures in August 2014, however, the main country, ensuring the delivery of dairy products to the Russian Federation, is the Republic of Belarus. About 42% of all dairy products was imported from Belarus in 2013, 52% in 2014 and about 85% in 2015 (Sudnitsyn D.A., 2015; Day G.S., Wensley R., 1988; Hoffman N. P., 2000). Besides Belarus, Uruguay (about 3%, preferably butter), Argentina (about 3%, butter, cheese Cheddar, Gauda, etc.), New Zealand (2%, butter), Kazakhstan (less than 1%, milk and concentrated cream or sugar containing cream) and a number of other countries (Serbia, Armenia and others) supply dairy products to the Russian market nowadays (http://www.mcx.ru/news/news/show/53463.355.htm, Date of appeal 22.08.2016; http://www.mcx.ru/news/news/show/50734.378.htm, Date of appeal 22.08.2016; http://www.souzmoloko.ru/news/rinok-moloka/rinok-moloka_3419.html, Date of appeal 29.09.2016). In general, at the end of 2015 the import of so-called "non sanction" countries became higher by 4% approximately, i.e., a certain volume of imports "changed" not by domestic production but by the imports from other countries.

With the economic crisis, which is experienced by Russia nowadays, the purchasing power of population fell sharply, and the priorities and the needs of the entire model of consumer behavior in general also changed. Many people are forced to move from usual expensive and high-quality products to more affordable, cheap goods. The consumption of more expensive

types of dairy products such as cream, yogurt, fermented baked milk and various kinds of cheese decreases.

Economic and political conditions in which dairy market participant work, lead to the accelerated development of the trends negative for dairy industry. These conditions prevailed in late 2014 and strengthened in 2015-2016. The devaluation of the national currency led to credit resource cost rise, the freezing of investment projects, the increase of costs and to the profitability reduction among milk producers and processors. The participants of the dairy industry, starting the process of production efficiency restoration in 2014 after the years of stagnation (in which an important role was played by the change of state support mechanisms), were not ready for such a development of a new economic situation. Thus, they were forced to cut costs, which naturally affected the performance of industry as a whole.

The crisis of Russian dairy industry emerged on the market of whole milk powder and butter most severely. With the beginning of economics liberalization in Russia the pressure of imports increased dramatically on this market, which is related to the propaganda of a healthy way of life in Western Europe and to the reduction of fat product consumption. Thus, Russia imported up to 245 ths. tons of oil at dumping prices yearly during the period of 2007-2009, that was the main reason for more than 3 times decline of its production at country dairies (from 833 ths. tons in 2004 up to 212 ths. tons in 2013).

In current situation 2016 is characterized by the stagnation of raw material production, the increase of imports, as well as the competition increase in domestic market, including pricing one while maintaining the market trends at the dairy market of the country (http://exp.idk.ru/news/ceny-na-molochnye-produkty-budut-rasti/415223/, Date of appeal 22.08.2016).

The winners are mainly the producers of butter and cheese and cheese products, the growth rates of production in these segments reached tens of percent during the last 2 years. Also, Belarusian producers who were able to increase the volume of deliveries to the Russian market, as well as to strengthen the impact on the market in terms of pricing turned out to be the winners.

However, Russian producers have a high potential for production volume increase: the consumption of dairy products in the country makes 190 - 2502 kg according to various estimates at the rate of 300-330 kg per year.

The main problems of long-term competitive advantages development of Russian dairy enterprises

In our opinion, it is necessary to take urgent measures aimed at the development of dairy industry raw material base in the current situation that will contribute to the development and the retention of its product competitive advantages. At that one should understand that the rapid increase of the raw material base is impossible in dairy industry (https://person-agency.ru/salary.html, Date of appeal 22.08.2016).

There are major problems during the process of long-term competitive advantage development at the enterprises of Russian dairy industry. In our opinion the main problems are the following ones:
1. Low investment attractiveness of dairy farming in most regions.
2. The state support is uncertain, unstable and insufficient in most cases.
3. The growth of milk purchase price.

4. Milk purchase price volatility, when producers and processors operate in virtually unpredictable conditions. There are great difficulties in planning.
5. The difficulty of debt financing attraction, the lack of circulating assets
6. The absence of professional staff.
7. High rates of energy price growth, especially in respect of diesel fuel and electricity prices.
8. The absence of technologies, technological equipment manufactured in Russia.
9. The absence of effective state control concerning the compliance of product quality and technical documentation, thus forage quality, the quality of raw milk, etc. suffer
10. The absence of independent laboratories and the limited opportunities for various analyzes, the use of outdated methods for the analysis.
11. The pressure of retailers during supplied product pricing.

It seems to us that one of the most pressing issues affecting the competitiveness of domestic dairy products is its high cost.

Dynamics of prices for dairy products during economic sanction regime

It should be noted that since the imposition of sanctions and the adoption of the response to the import substitution by RF Government a consistent trend to dairy product price increase is observed. So, the rise of raw milk prices made 28.5% from August 2013 to August 2015. During the same period, the prices of industrial producer prices for pasteurized whole milk grew by 31.5%, the retail prices for whole pasteurized milk with 2.5 - 3.2% fat content grew by 31.4%. However, producer prices for hard cheese increased by 32.8%, cheese product prices increased by 49.5%, and cheese retail prices increased by 38.8% on the average. A similar situation is with butter. From August 2013 to August 2015 the retail prices of butter rose by 38.9% on the average, while producer prices rose by 30.3%. In general, dairy product prices rose by 13.7% in 2015 (Hollensen S., 2002; Prahalad, C.K., Hamel, G.,1990; http://base.garant.ru/12172719/ , Date of appeal 20.09.2016; http://milknews.ru/analitika-rinka-moloka/molochnaya_otrasl.html#ya1, Date of appeal 22.08.2016).

According to the National Union of Milk Producers (Soyuzmoloko) and Analytical Center Milknews, the price increase continued in the I-st quarter 2016, and the main role was played here by seasonal demand factors and devaluation risks. In comparison with the level of June 2015, the price of drinking whole pasteurized milk with 2.5-3.2% fat content was higher by 2.4% in June 2016. At that in the retail segment, this product is sold at 48.3 rubles/l on the average (without significant changes during the last month) and rose by 6.0% during the year. At the same time the prices of ultrapasteurized (and sterilized) milk decreased by 0.3% (to 36.9 rub./kg) on the average among industrial producers in July 2016, and retail price increased by 0.4 % (up to 65.9 rubles/kg). These prices are higher than the levels of the previous year by 17.7% and 5.4% respectively (See Figure 2).

Figure 2
AVERAGE PRICES FOR DRINKING MILK (PRODUCTION) AND WHOLE DRINKING MILK WITH
2.5-3.2% OF FAT CONTENT (RETAIL PRICES) IN JULY 2016. (http://milknews.ru/analitika-rinka-
moloka/rinok-moloka-v-Rossii/rinok-moloka-v-Rossii_290.html, date of appeal 10/04/2016)

Average prices for drinking milk in July 2016, rub./kg (retail - rub./l.).
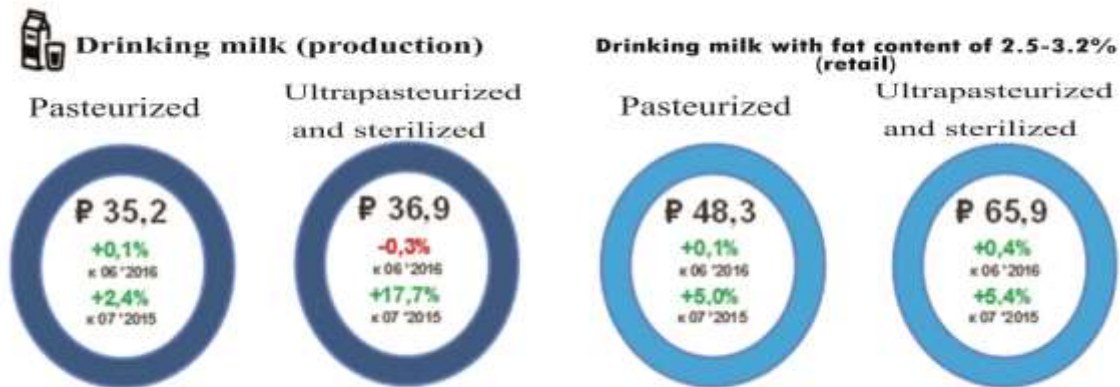
Prepared by "Soyuzmoloko" together with AC MilkNews according to Rosstat data

In August 2016 the prices for drinking milk continued to grow and increased by 7-13% as compared to August 2015. At that the average price of producers for drinking sterilized and ultrapasteurized milk increased by 13%, cream price rose by 7%, sour cream price rose by 8%, cheese price rose by 7%, yoghurts and other types of fermented dairy products (except for sour cream) rose by 7%. Also, the rise of prices for raw milk were noted, the cost of which has a direct impact on the final product price. Overall, as of 31 August 2016 the level of procurement prices for raw milk increased by 9% in August 2016, reaching the figure of 21.15 rubles per kg (excluding value added tax - VAT).

We explain such a significant price increase in the manufacturing and retail sector by the delayed effect from price increase for raw milk in 2013 - 2014 caused by the attempt of agricultural producers to provide the profitability level necessary for production modernization (which was not reached) within the terms of raw milk persistent shortage and the expansion of dairy product import volume(http://www.gks.ru/dbscripts/cbsd/DBinet.cgi; Date of appeal 22.08.2016).

However, it appears that the raw milk price growth will be diminished gradually due to consumer demand decline for dairy products and a high price competition with the Belarusian exporters of dairy products in Russia.

As raw milk determines the retail prices for all dairy products (in the structure of drinking milk price raw milk occupies over 40 per cent in curd price structure - 36% on the average, and over 50% in the structure of sour cream price), the upward trend is also observed at cheese and cheese product markets. In July 2016 the average hard cheese price from industrial producers continued its upward trend and added 2.1% (up to 320.5 rubles/kg.); the price growth made 8.3% during the year. At the same time the wholesale prices for cheese products rose by 4.0% on the average, up to 87.8 rub./kg. As for the retail segment, the price of hard and soft cheese decreased

slightly (-0.2%, down to 430.3 rubles./kg). At that the average price is higher than the corresponding previous year price by 6.8%.

Figure 3
AVERAGE PRICES ON CHEESE AND CHEESE PRODUCTS IN JULY 2016.(http://milknews.ru/analitika-rinka-moloka/rinok-moloka-v-Rossii/rinok-moloka-v-Rossii_290.html, date of appeal 10/04/2016)
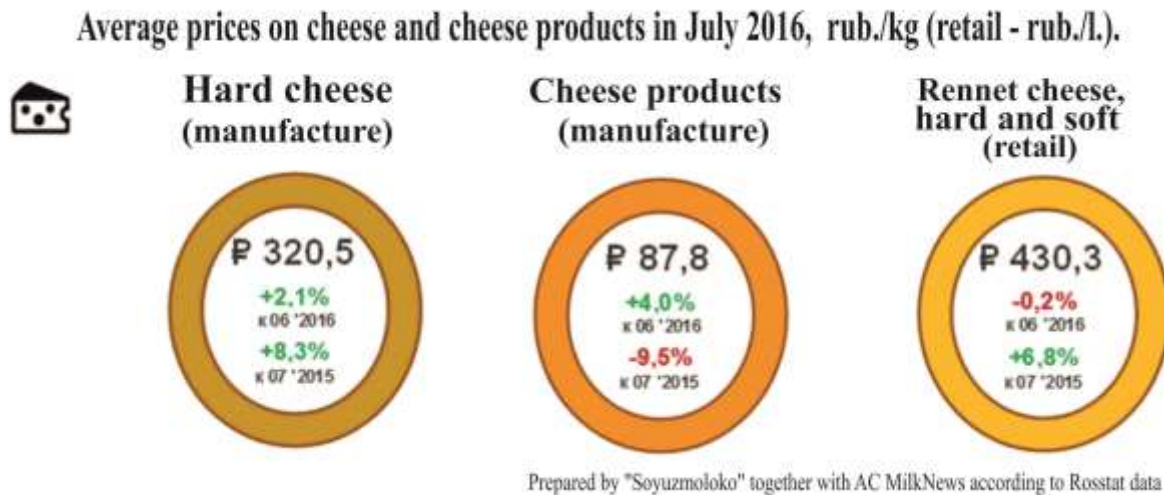
The price increase was also observed in butter segment. The growth of wholesale prices for butter led to the rise in prices in retail segment: in June 2016 butter cost increased by 0.6% in Russia on the average, up to 412.2 rub./kg (+ 6.9% per year).

Margarine prices also increased in July 2016: by 2.1% (up to 52.5 rubles/kg.) among producers, the retail price increased by 0.5% (up to 121.9 rubles/kg). (See Fig. 4).

**Figure 4**
AVERAGE BUTTER AND MARGARINE PRICES IN JULY 2016.(http://milknews.ru/analitika-rinka-moloka/rinok-moloka-v-Rossii/rinok-moloka-v-Rossii_290.html, date of appeal 10/04/2016)
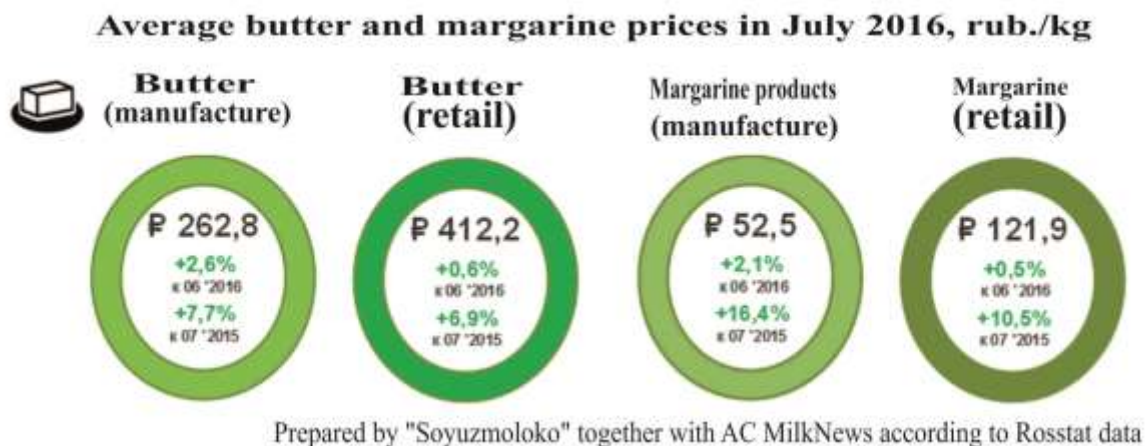
Thus, we must conclude that the imposition of sanctions in 2014 had a negative impact on pricing in the industry, causing the increase in the procurement milk prices, milk producer and wholesaler prices. Besides, the operating costs at all stages of production and the processing of milk increased due to national currency devaluation. And the production price growth has a direct impact on the growth of retail prices. As the trend of price increase in the retail sector will continue throughout 2016, in our opinion, it will not be able to influence the reaction of consumers   and   their   buying behavior(http://www.gks.ru/dbscripts/cbsd/DBInet.cgi/DBInet.cgi?pl=9000637, *Date of appeal: 05 10. 2016).*

Figure 5
MILK AND DAIRY PRODUCT CONSUMPTION DYNAMICS PER CAPITA, kg/year
(http://milknews.ru/analitika-rinka-moloka/molochnaya_otrasl.html#ya1, Date of appeal: 05 10. 2016;
http://milknews.ru/index/novosti-moloko_3437.html , Date of appeal: 05 10. 2016)
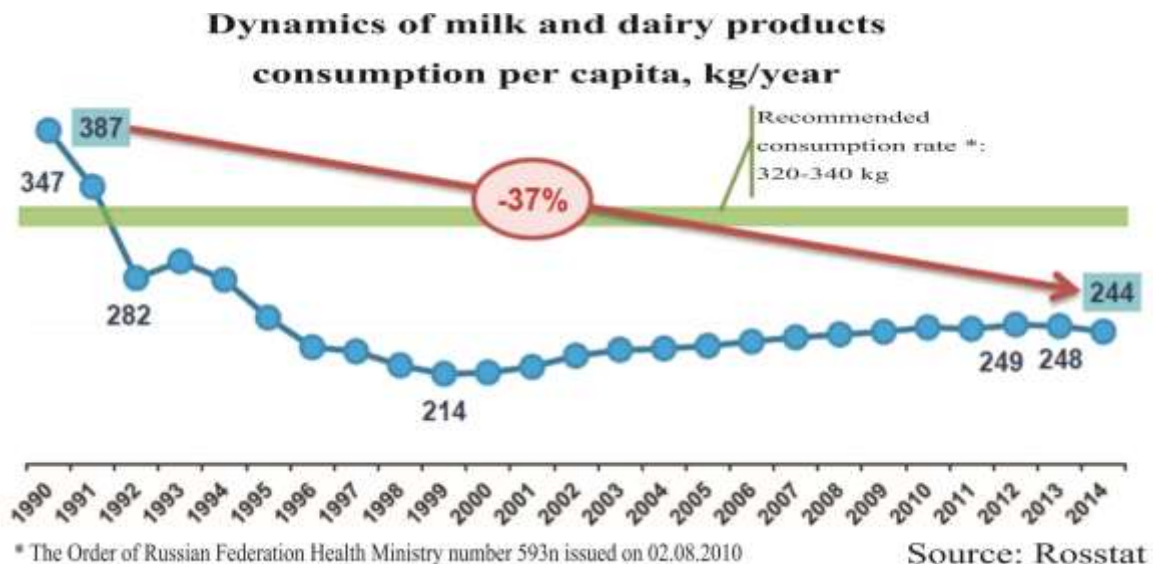
The experts from "Milknews" analytical center say that the consumption of milk and dairy products by RF population decreased over the past few years. The last time (statistically) the recommended norm consumption was provided in 1991, when the actual amount of consumption made 347 kg/men/year. Further, the volume of consumption decreased, reaching its minimum in 1999 (214 kg/men/year), after which a gradual growth was observed until 2012 (249 kg/men/year). In 2013, due to the economic crisis and the purchasing power decline there was a slight decrease (down to 248 kg/men/year), which continued in 2014 (down to 244 kg/person/year   -   74%   of   the   recommended   norm)(http://www.agroclub.ru/people/user/202/blog/2335/?sphrase_id=3476541,   Date   of   appeal 22.08.2016). And if in 2013, for example, the average consumer might buy 630.5 liters of drinking milk per month and 93.6 kg of butter, in 2014, he could buy 570.0 liters (-10%) and 82.1 kg (-12%), respectively. According to the Federal State Statistics Service (Rosstat), the consumption of milk and dairy products in Russia continued to decline during post sanction period by 1.6% per year. Currently, the amount of milk consumption per capita makes 244

kg/year in Russian Federation on the average, which is 36% below the recommended norm from Russian Ministry of Health (RF Health Ministry order number 593n issued on 02.08.2010).

RESULTS

The algorithm of competitive advantage development strategy for domestic dairy products in terms of import substitution

In this regard, we consider it is necessary to propose an algorithm for the development and the implementation of competitive advantage development strategy for domestic dairy products in terms of import substitution, which provides the basic stages in practice and the sequence of marketing activity implementation, contributing to the creation of competitive advantages for domestic dairy products.

In our opinion, the development of competitive advantage strategy for Russian dairy products must be economically, technologically and socially justified. However, its development, as it seems to us, is based on the key principles and the approaches used in marketing practice taking into account the specifics of dairy industry products. It should be noted that the maximum increase of competitive advantages is possible in a certain ideal model under the following conditions:

1) if the manufacturing companies have a new and an improved technology,
2) if there is a considerable interest on the part of consumers, i.e. a constant demand for products,
3) if the optimum product distribution channels are developed,
4) if there is no intense competition.

We consider it is necessary to distinguish four main stages in our proposed algorithm:

Step 1 - Analysis: This step determines key internal and external factors that prevent the formation of product competitive advantages in dairy industry;

In our opinion it is important to perform the following here:
a) the internal environment audit among major manufacturers (production capabilities, resource analysis, etc.)
b) to analyze the activities of competitors, using SWOT tool and PEST-analysis;
c) to conduct a survey / a questioning of consumers in order to identify their dissatisfaction factors;

2-nd stage - The stage of main features determination and the retention of the competitive advantages for dairy products.

In our opinion the following procedures should be used here:

a) The evaluation of quality as the basis of milk production competitive advantages and the implementation of its improvement measures, including the quality improvement through the use of a greater percentage of natural ingredients and fillers, vitamins, probiotics enrichment etc., the proposals to minimize the issue of milk product falsification;

b) the tightening of control by the state, and by an enterprise for compliance with standards and GOSTs;

c) State support aimed at the creation of new raw material sources, the increase of cattle number, the introduction of modern technologies and innovations, as well as equipment upgrades.

3rd stage - Marketing activity priority determination stage.

At this stage, we believe that the following measures are the most important ones:

a) Communication policy change. The stimulation of overall demand for milk and dairy products. "Time to drink milk!". The creation of multiple advertising messages with the general promotion of dairy products. Cross promotion;

b) Sales promotion: the performance of promotions and tastings;

c) Product package change (various packaging, travelling option, color change, etc.);

d) Flexible pricing policy;

e) Promotion through the Internet and social networks.

4-th stage - Monitoring stage concerning the implementation and the evaluation of strategy efficiency

The control over the implementation of marketing strategy includes:

a) the setting of target indicator values;
b) the evaluation of indicator actual values;
c) comparison;
d) the analysis of obtained results;
e) the development of measures to improve a company marketing.

At that they apply the control results and marketing audit. The task of result control is the check of marketing strategy correctness and effectiveness by the comparison of planned and actual values.

The study of the largest Russian companies producing dairy products, such as: "Wimm-Bill-Dann", "Danone", Novosibirsk Dairy Plant, "Milko", "Campina", OJSC "Hladocombinat", the agricultural company "ANK", the agricultural company "Partizan", the OJSC "Blagoveschensky Dairy plant", Zhulanka company allow to identify their competitive advantages, the main of which are the following ones:

1. Modern technologies that allow to reduce the production costs and improve its quality and increase product output;
2. Production volume;
3. Strict quality control at all stages of production;
4. Naturalness / Ecological compatibility, which is especially important for young children. It is expressed in the absence of additional components which are not completely natural, such as aroma similar to natural one, starch, various stabilizers, preservatives, etc. Also, this aspect is related to livestock food and the absence of antibiotics in milk;
5. Continuous supply of raw milk;
6. Storage \ Logistics;
7. High standards of production hygiene;
8. Developed dealer network;
9. Packing, which increases the shelf life and has a unique design / form;
10. The avaiability of brands;
11. The constant update of assortment;

12. Taste and texture;
13. Cost;
14. Centralised activities for product sales promotion.

In our opinion, one should highlight the key competences among the considered ones, which correspond to the basic properties of a key competence:

- they provide the access to new markets;
- they make a significant contribution to the value of a final product perceived by a customer;
- they are difficult to copy for competitors.

We decided to reflect them in the following table:

Table 1
KEY COMPETENCIES OF DAIRY PRODUCTS

	Access to new markets	They contribute to a final product value perceived by a client	Competitors find its simulation difficult
Modern technologies	+	+	+
Production volume	+		
Strict quality control at all stages of production		+	
Naturalness \ Ecological compatibility		+	
Uninterrupted supply of raw milk (own raw material base)	+		
Storage \ Logistics	+	+	
The highest standards of production hygiene		+	
Developed dealer network	+		
Packaging	+	+	
Brand		+	+
Constant update of assortment		+	
Taste and texture		+	+
Cost	+	+	
Centralized activities for product sales stimulation	+		

Source: developed by the authors on the basis of marketing activity analysis among Russian dairy market leaders

CONCLUSIONS

Thus, a sustainable competitive advantage of dairy products includes key competencies and complies with the following characteristics: a better set of skills and resources; they are invisible to a consumer, unique ones, valuable to an organization and a customer, and they can not be forged or copied. The development of competitive advantages in the dairy industry is an important task during economic crisis and sanctions.

SUMMARY

Thus, this study strongly suggests that the development of competitive advantages in Russian dairy production requires a large-scale implementation of technical, technological and marketing activities, which are the constant attributes of a competitive economy, which asserts a new vector of the dairy industry development, which is radically modernizes its technical basis, and marketing activities.

The regime economic sanctions against Russia imposed by Western countries gives a unique chance for the Russian dairy industry to implement the import substitution strategy and increase the competitiveness of its products.

However, the task of competitive advantages development in the domestic dairy industry shall be implemented as soon as possible, because sanctions cease to work sometimes, and then the world leaders in the production of milk and dairy products will return to the Russian market. And these leaders have competitive advantages. A strong initiation impulse towards the modernization of Russian dairy industry is necessary not to miss the chance to be among these leaders.

CONFLICT OF INTEREST

Authors confirm that the submitted data don't contain the conflict of interests.

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THE ROLE OF THE PUBLIC PRIVATE PARTNERSHIP IN THE INNOVATION CLUSTER DEVELOPMENT

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ABSTRACT

The article dwells on the problem of the innovation cluster development, analyses the existing trends, singles out the key factors that create the favorable conditions for the cluster formation and its further growth. In this aspect a special place is given to the mechanism of the public private partnership (PPP), which is considered to be an effective tool prompting the development of the national innovation system and the economic growth of the country as a whole. The authors of the article have undertaken the thorough research of the matter, including the analysis of the indicators of the innovation activity for the last years as well as the comparative analysis of the foreign experience of implementation of the PPP. The results achieved upon this analysis are used in formulation of the perspective trend in the innovation development – the PPP mechanism, which is viewed by the authors as the key element of the cluster development in Russia. The authors suggest that though the initial steps in formation of the PPP market in Russia have done, its further effective development depends on the initiatives of the state, its capacity and consent to run risks along with the private partner, and on the improvement of the current legislation. The adoption of the foreign models of cooperation such as subcontracting and outsourcing within the PPP are considered to be the efficient mechanisms in the innovation cluster development.

Keywords: public private partnership; innovation clusters; cluster policy; petrochemistry; subcontracting; outsourcing

INTRODUCTION

The necessity of Russia to find a way out of the stagnation trap set by Western countries requires the introduction of the effective tools prompting the economic growth in the country. In this respect the collaboration of the state and the business community in the form of the public private partnership (PPP) is the one of the most important conditions for the resumption of the economic growth and further development of the national innovation system.

The concept of the PPP in the innovation sphere consists in the coordination of the actions of the state and the business on the purpose of commercialization of the research and development sphere and implementation of the innovation into real sector of economy. It helps to direct the activity of the business entities from the resource-based economy towards development of the economy through the scientific and technological progress. And the efficiency of the scientific and technological progress and of its core – the innovation process – depends on the integrated efforts of the authorities, education, science, business, and their coordinated actions. This encourages the concentration of the investment from various sources within this or that form of the private public partnership in the priority spheres of implementation of the innovation projects.

According to the data of the international comparative analysis Russia has a relatively low percentage of the companies involved in the collaboration with the higher educational establishments and public institutions: merely 9% of the small and medium businesses as a fraction of all the innovative companies (for example, in China it is 19%), and two times less – the percentage of the big businesses (cf. Finland – 26%) [Ponomarenko, 2014].

THEORY

Much has been done on approaching the matter of the PPP in the home and foreign economic research works [Bareyev, 2012; Ponomarenko, 2014; Biermann, 2012; Klijn, 2013; Tang, 2010]. According to the statistic data, in the USA and Europe the PPP is the most commonly encountered in the spheres of industrial and social infrastructure: road construction, construction of communications, hospitals etc., the PPP in the sphere of innovation is widespread in Japan and China and the USA as well. In most cases the PPP is the collaboration between the public authorities of various levels and the private business within the innovation cluster policy.

In this connection it is important to define the economic matter of the innovation cluster. In the modern economic literature it is conventionally treated as the optimum form for the realization of the PPP mechanism (the models of the PPP in the cluster development is given in table 1).

Table 1
THE MODELS OF THE PPP IN THE CLUSTER DEVELOPMENT

Name of the model	Description of the model	Spheres of application
Operation model (contractual form, lease agreements)	The investor takes responsibility for the use of the object belonging to the state and receive compensation for it, and the state - the owner of the object - is responsible the performance of the public function before the consumers who pay for the services. The state invests own funds into formation of the industrial park and is its owner, and the functions of the developer consist in delivering services on formation of the infrastructure of the industrial park and its operation. Such organizational form is oriented on the reservation of the state's right to influence the policy of the internal decision making within the cluster. The use of the budget funds considerably restrains the development of this model.	Business incubators, educational centers of the shared use of technologies etc.
Concession model	The investor deliver services to the final consumers and is authorized to offset the expenses directly from the fee for the use of the object, and at that the responsibility is taken by the business entity (concessionaire) and the state (concession provider) preserve the functions of control. Such scheme allows to carry out large public-oriented projects without heavy budget outlay.	The objects of social and public significance (institutions of secondary and higher education)
Cooperation model	The public functions conferred on the joint enterprise created by the public partner and one or more private companies. The scheme of the implementation of the projects is based on the budget financing of its infrastructure and the provision of the land (facilities, objects) with performing other at investor's expense	Innovation and knowledge-intensive projects: technoparks, educational industrial clusters etc.

Considering the innovation sphere it is logically to mention the innovation clusters that create the effect of cooperation and this, in its turn, facilitates the cost savings.

Many foreign scientists studied the theoretical and practical aspects of the cluster formation and functioning: Bathelt, H. (2014), Lantu, D.C. (2015), Lee, J. (2013), Lorenzini, E. (2014), Tsertseil, J.S. (2015), Yun, S (2013). The works of Burger, P. (2014), Chen, L. (2011), Wonglimpiyarat, J (2010) are focused on the financing mechanisms of the innovation clusters. Chan A. P. C. (2014), Cooke P. (2013), Klijn E.-H. (2013), Marques R.C. (2014), Pattberg, P. (2012), Tang, L. (2010) dwelled on the problems of the PPP problems and its development in the innovation sphere.

Nowadays the problem of the financial provision of the innovation clusters is a hot-button issue. Therefore there must be several sources that in aggregate will create the most favorable conditions for the innovation cluster functioning process. The mechanism of financing of the innovation clusters in Russia is shown in Fig.1.

Among the investment sources of the innovation clusters seen in Fig.1. the PPP mechanism is carrying weight. Therefore it is worth of being examined and analyzed in order to bring out its advantages and prospects for development. Furthermore, it is expedient to consider the international experience of the financing of the innovation clusters.

In whole the project market with adopted PPP mechanism is characterized by positive dynamics. For instance, in 2011 the demand exceeded 100 billion USD (see Fig.2).

Reasoning from the diagram in Fig.2 we can suppose that in 2012-2015 the demand will increase due to the annually growing number of the PPP projects (see Table 2).

Table 2
THE PPP PROJECTS DYNAMICS IN 2013-2014

Year	2013	2014
Number of the PPP projects	131	595

According to Unified information system of the PPP in Russia in 2014 there were 595 projects, 124 of them – in the initial state, 89 – in the preinvestment state, 250 – in the state of investment, 108 – in operation and 24 projects are on the final stage.

In Russia the cluster policy is the element of the PPP, though often the interests of the business and the authorities do not match. It is noteworthy that the basis of the cluster policy is the partners' freedom in choosing the most efficient methods and ways to objectives, which stimulates the creative productive activity of the partners and thereby encourages the healthy competition and diversification of the economy as a whole.

Figure 1
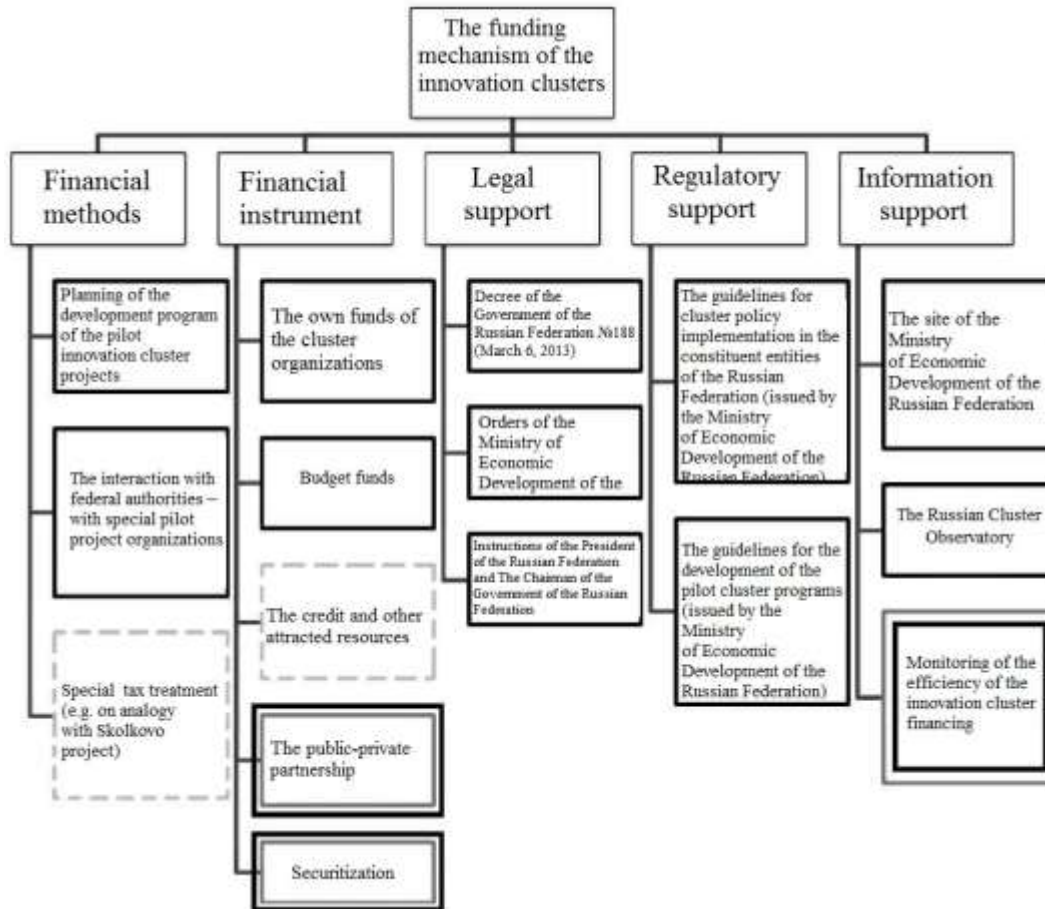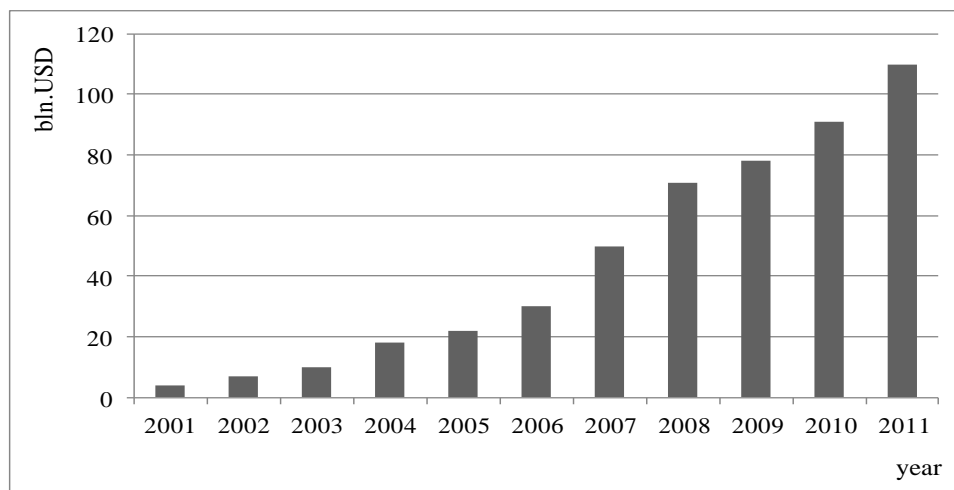**THE MECHANISM OF FINANCING OF THE INNOVATION CLUSTERS IN RUSSIA**

Figure 2
THE DYNAMICS OF THE DEMAND FOR THE PPP PROJECTS IN RUSSIA

The commitment of the state, in our opinion, is to eliminate the barriers in involvement of the business entities into innovation sector; it consists in reducing of the commercial risk and of the investment return period. This can be achieved via a number of forms and ways, such as: direct financing, direct participation financing, indirect financing of the project stages.

Conventionally the innovation clusters are associated by their geographic location. However, we do not consider this factor the determinant. In our view, the important condition is the presence of a lot of innovation projects with common information space that unite the representatives of different sectors of economy.

We share the opinion of A.I.Kotov and O.V.Lobachev who suggest the idea that "the basis of the innovation cluster lays in the intellectual capital of the R&D centers, higher educational establishments, design offices, which in whole constitute the pool of assets that can be used for the innovation activity development" [Kotov, Lobachev, 2011].

Each cluster (including the innovational ones) can be characterized by the following parameters [Bareyev, 2012]:

- the main directions of the implemented technologies in the production processes;
- the list of firms – the cluster members;
- the list of the scientific research and educational establishments – the cluster members;
- the main parameters of the cluster development (the volumes of investment and revenue etc.).

On the basis of the competitive selection held by the Ministry of economic development of the Russian Federation in 2012, 25 Russian innovation clusters acquired the status of pilot project. In general all the selected projects has comprehensive possibilities for development and growth (see Table 3 [Tingaev, 2014]).

Table 3
DEVELOPMENT OF THE PILOT INNOVATIVE TERRITORIAL CLUSTERS: THE KEY INDICATORS

Indicator	The current value, bn. roubles (for the given years)	The anticipated value, bn. roubles (for the given years)	Dynamics of the indicator (for the given years)	The average Russian value, according to the Ministry of economic development of Russia (for the given years)
The total value of the revenue from the sales of the non-resource products in the home and the foreign markets	1, 862,8 (2011)	3 810,6 (2016)	Growth rate – 105 %	The rate of increase of the industrial production at current prices –58 % (2011-2016)
The total value of the private investment into production, development and promotion of the new products in	644,5 (2009-2011)	1 574,2 (2012-2016)	The ratio of the average annual volume in 2012-2016 to the average annual volume in 2009-2011 – 146 %	The total volume of the private investment – 23, 800 bn. roubles (2009-2011)
The total value of the outlay on the	1, 110,0 (2007-2011)	968,8 (2012-2014)	The ratio of the average annual	2, 552 bn. roubles (2007-2011)

R&D	volume in 2012-2014 гг. the average annual volume in 2007-2011 – 145 %

Financial sustainability of the cluster members is determined by the competitiveness of the pilot clusters and the presence of their powerful potential production. This, in its turn, prompts the attraction of the material resources for the realization of the large-scale research and infrastructural projects.

And this is the reason why the volume of the total revenue from the sales of the non-resource products in the home and the foreign markets was assumed as one of the key indicators for evaluation of the economic and financial capacity of the pilot cluster projects. As it is seen from the table above, the total value of this index in 2011 amounts nearly 1, 9 bn. roubles. The majority of the cluster members expect to increase the sales volume: by 2016 it is supposed to be 3,8 bn.roubles (with the growth rate equaling to 105%). Consequently, the dynamics of the industrial production on the territory of the pilot cluster projects is to exceed the corresponding average value in country as a whole 1,8times (it' is 58%, according to the forecast of the Ministry of economic development of Russia).

There are altogether 4 main economic sectors notable for the active projects based on the PPP mechanism that can be singled out among the whole range of existing programs (see Table 4).

Table 4
THE PPP PROJECTS IN THE ASPECT OF THE SECTORIAL BELONGING [UNIFIED INFORMATION SYSTEM OF PUBLIC-PRIVATE PARTNERSHIP IN RUSSIA]

Sectors	Housing and community amenities	Transport	Energy sector	Social services	Total
Number of projects	194	72	163	166	595
Amount of investment (bn. roubles)	88	350	46	387	871

The cross-sector overview shows that the clusters with the most influential investment possibilities are those that belong to the group "Chemistry and petrochemistry": for the period 2009-2011 the amount of private investment equaled to 501,8 bn. roubles (on average 125,5 bn. roubles per cluster of this economic sector), and in 2012-2016 the investment is planned to increase upto 1,2 tln. roubles [Tingaev, 2014].

Furthermore, the extent to which the programs in the sphere of the PPP are spread considerably varies from region to region (see Table 5). As it is seen from the table the leading regions in this aspect are Central Federal District and Volga Federal District (145 and 176 programs respectively). North Caucasian Federal District is noticeably behind other regions – only 8 PPP-projects. Crimean Federal District has a vast experience in the PPP sphere, despite the lack of the statistical data for this region up today.

Table 5
DISTRIBUTION OF THE PPP PROJECTS IN THE FEDERAL DISTRICTS OF RUSSIA

Federal district	Social services	Transport	Energy sector	Housing and community amenities	Total
Central Federal District	43	30	19	53	145
Southern Federal District	2	4	1	13	20
Northwestern Federal District	42	9	8	13	72
Far Eastern Federal District	11	1	9	36	57
Siberian Federal District	17	5	30	23	75
Ural Federal District	6	3	5	10	24
Volga Federal District	46	15	65	50	176
North Caucasian Federal District	5	2	0	1	8
Crimean Federal District	0	0	0	0	0

The leading regions include six federal subjects of Russia where the PPP mechanism is widely spread. Within them the leading positions are taken by Moscow, Saint-Petersburg, Leningrad Oblast and the Republic of Tatarstan (see Fig. 3).

The Republic of Tatarstan is one of the most dynamically developing regions in the Russian Federation. Far back in 2011 «Forbes» magazine recognized Tatarstan the most favorable region for business. According to the annual rating of the economic attractiveness of the regions based on the six criteria (labour force, demand for fast moving consumer goods, for durable goods, dynamics of economic growth, infrastructure, tax policy), suggested by the Russian magazine "Director General", in 2015 Tatarstan acquired the 6th place, being viewed as one of the most perspective regions of Russia.

Figure 3
THE LEVEL OF DEVELOPMENT OF THE PPP IN THE REGIONS OF RUSSIA
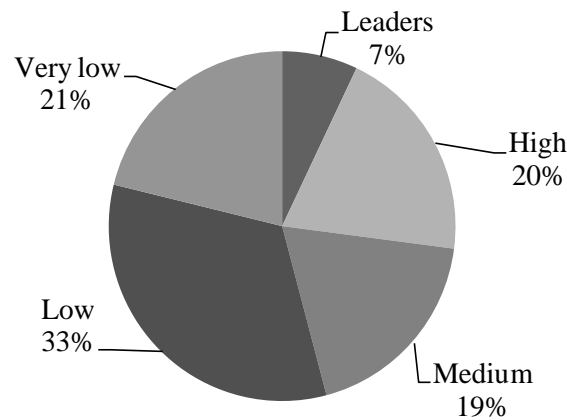
The Republic of Tatarstan in a remarkable manner combines nearly all factors of the investment prospects. According to the rating given by The National Rating Agency (NRA), Tatarstan ranked among the regions with high level of investment prospects. This rating is based on the 7 factors and in every respect Tatarstan is among the top 12, that favored the active position of Tatarstan in development and support of the PPP projects.

Realization of the PPP projects is recent phenomenon for the Republic of Tatarstan. Figure 4 illustrates the quantity of the PPP projects in various spheres, underway and already accomplished. Thus, the PPP projects in multitude are being realized in the field of education and science and in the sphere of integrated territorial development. The latter implies formation of the special economic zones, technoparks, industrial parks, innovation centers and clusters.

Figure 4
NUMBER OF THE INVESTMENT PROJECTS IN THE SPHERE OF THE PPP IN TATARSTAN
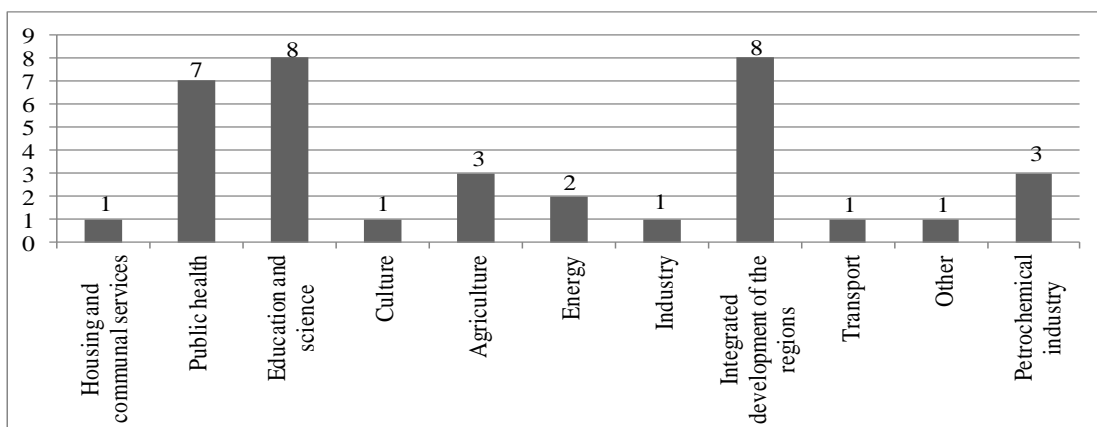
Within this aspect we may dwell on the case of Kama innovative territorial production cluster in the Republic of Tatarstan. The main parameters of the cluster are given in the Table 6.

Table 6
THE MAIN DEVELOPMENT PARAMETERS OF KAMA INNOVATIVE TERRITORIAL PRODUCTION CLUSTER IN THE REPUBLIC OF TATARSTAN ON JANUARY 1, 2014 [DEVELOPMENT PROGRAM "KAMA INNOVATIVE TERRITORIAL PRODUCTION FOR THE PERIOD UP TO 2020"].

Development parameter	Parameter value
Investment volume, tln. roubles	40,7
Revenue volume, tln. roubles	600,0
R&D expenditures, tln. roubles	41,9
Increase in R&D expenditures, %	130,5
Increase in investment, %	770,1
Increase in revenue, %	86,9

Despite the high development potential of the cluster enterprises the growth rates of their main parameters characterizing their activity are restrained. Chiefly, the restrictive factors are as follows:

- The difficulty of raising funds necessary for the project realization (the investment volumes and sources of the development program "Kama innovative territorial production cluster for the period 2012-2020 are given in Table 7).

- The long-term economic return of the project due to its dimensions;

- The deficiency in highly qualified personnel necessary for the existing and greenfield high-tech productions;

- The deficiency of the unified development strategy.

Table 7
THE INVESTMENT VOLUMES AND SOURCES OF THE DEVELOPMENT PROGRAM "KAMA INNOVATIVE TERRITORIAL PRODUCTION CLUSTER FOR THE PERIOD 2012-2020 [DEVELOPMENT PROGRAM "KAMA INNOVATIVE TERRITORIAL PRODUCTION CLUSTER FOR THE PERIOD UP TO 2020"], TLN. ROUBLES

Source of financing	Total	Federal Budget	Budget of the Republic of Tatarstan	Extrabudgetary funds
2012	242,2	25,7	14,5	202,0
2013	196,4	26,7	16,0	153,7
2014	197,1	24,7	11,5	160,9
2015	167,6	12,6	6,6	148,4
2016	59,2	7,2	6,1	45,9
2017-2020	29,3	0,7	3,8	24,8
Total value for the Program	891,8	97,6	58,5	735,7

The solution of these problems becomes possible only with the assistance of the public authorities and institutions of local governing and by means of PPP mechanisms. Moreover, the main supporting measures of the cluster activity include the development of the regulatory acts in addition to the regional legislative act about the PPP. And in our opinion, it is expedient to use the experience of Voronezh oblast in related to creation of the Center of the cluster development,

the main purpose of which is realization of the cluster policy with innovative direction and attraction of federal, regional and private financial resources.

Nowadays the development institutions of the macro level that practice the mechanism of the public private partnership, raise finance for the innovation business undertakings and focus on formation of the clusters, are as follows:

-        Industrial production, technical innovation and tourist recreational special economic zones (SEZ);

-        The Investment Fund of the Russian Federation which on a competitive basis provide funding for the infrastructural projects of national and interregional value;

-        The Venture Innovation Fund, The Russian Venture Company, The Russian Investment Fund (PBK), The Russian Investment Fund for information and communication technologies (Rosinfocominvest), the regional venture funds.

The institutions of the micro level are:

- corporate venture projects and funds;

- business angels, their network and alliances;

- nearly 60 domestic and foreign funds for R&D financing;

- more than 150 big financial companies and commercial banks;

- 34 domestic grant-making foundation, more than 200 foreign funds and financial organizations.

Petrochemistry is undoubtedly the sector with great perspectives for the PPP mechanisms. The development strategy of the chemical and petrochemical industry in the Russian Federation up to 2015 stipulated the use of PPP mechanisms for development of the chemical and petrochemical complex. [The development strategy of the chemical and petrochemical industry in Russia for the period up to 2015]. However it is noteworthy the emphasis in this sphere should be laid on the development of the large infrastructural projects with self-maintained economic effect or those that provide backing for development of the huge industrial objects and whole zones (clusters) [Sultanova, 2007].

The form of the partnership should be chosen in accordance with the specific purpose, the terms of the project, its members, the share of the state in the projects and many other criteria. Consequently, the chosen form of partnership determines the ownership conditions. The optimum distribution of property in its turn creates conditions for the efficient functioning of the partnership objects, for their optimum management and efficient allocation of resources.

In practice, nowadays the most common form of the public private partnership in Russia is concession, it is due to the Federal Law № 115-FZ " On concession agreements " (July 21, 2005).

Figure 5
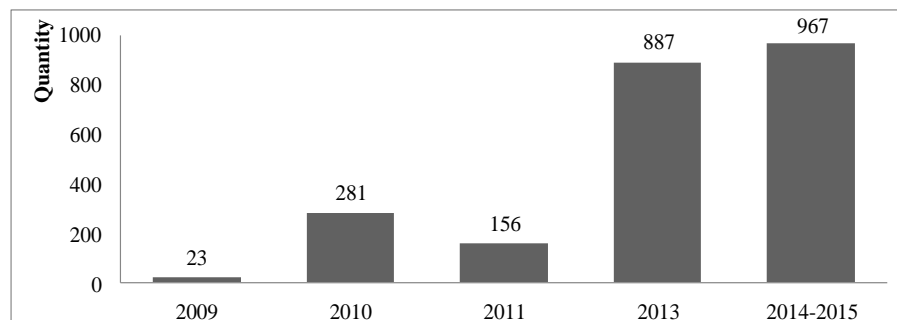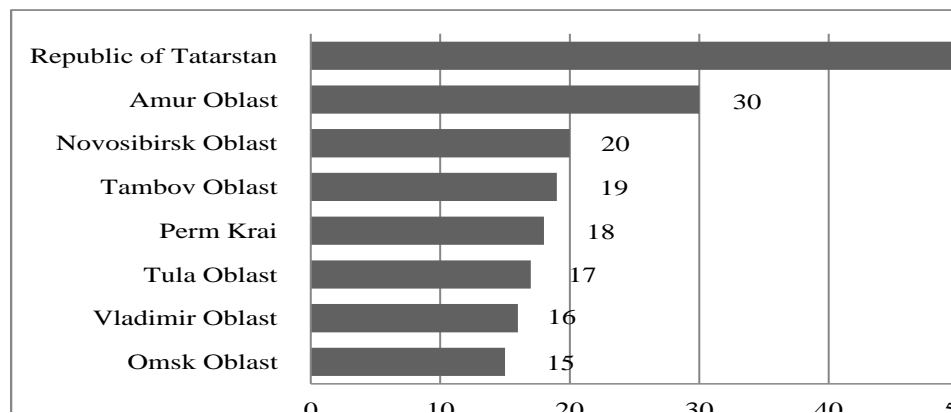**THE GROWTH DYNAMICS OF THE CONCESSION AGREEMENTS CONCLUDED**

Figure 6
THE NUMBER OF THE CONCLUDED CONCESSION AGREEMENTS IN THE REGIONS OF RUSSIA

According to the analytical reports of the Chamber of Commerce and Industry, 2013 and 2014-2015 show the take-off in concession agreements (See Fig.5).

The diagram above (Fig. 6) marks the regions, leading on the number of the concluded concession agreements.

CONCLUSION

Thus upon analysis of the materials on the PPP projects in Russia we may conclude on the positive dynamics in development of the collaborative interaction between the state and the private business, especially active this process is in Volga Federal District, Central and Northwestern Federal District.

It's noteworthy that the initial steps in formation of the PPP market in Russia have done and its further effective development depends on the initiatives of the state, its capacity and consent to run risks along with the private partner, and on the improvement of the current legislation, in particular passing the normative acts regulating the public private partnership in Russia.

As for the cluster development, in our opinion, the adoption of the foreign models of cooperation such as subcontracting and outsourcing would be helpful. Particularly these PPP mechanisms would be effective in the innovation clusters development.

Subcontracting represents the broad network of the subcontractors and is ministrant to the considerable reduction of the production profundity and to the possibilities of the quick renovation of the lineup by the industrial companies (contractors). Subcontracting is based on the specialization, the rational use of production capacities, the optimum use of the resources.

As for the outsourcing, the main peculiar feature of this agreement consists in that the employer recruits personnel, pays salaries, makes other proper payments under labor law, and then provides other company with these employees for participation in the production process, the production management and for performing other related functions.

In such a way, the public private partnership within the development of the innovation clusters contributes to reduction of the business risks associated with investment into the innovation technologies that helps to define the priority ways of investment attraction for their further effective application. Moreover, it stimulates the development of the brand new services and products, and also ensures the profitability of the innovation technologies, products and services. But for all that as the major irreversibility factors of cluster formation we should recognize the growing innovation receptivity of the business and its involvement into the cluster construction; development of the "triple helix" model - the interrelation of the science, the business and the state, who as the main cluster members gain competitive edge consequent upon the joint effects of scopes and synergy.

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HAPPY INDEX AS AN ALTERNATIVE MEASUREMENT METHOD OF GROSS DOMESTIC PRODUCT

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ABSTRACT

In economics, as well as in any science, the modeling verbal, graphic and mathematical – is of inestimable importance.

There exist various procedures for evaluation of joint social welfare: the use of standard evaluation methodology by means of national accounts and its modification, as well as measurement using composite indicators. Over a considerable time period the GDP has occupied the leading position as a social welfare evaluation indicator. However, it currently becomes obvious that the natural and the human capital will constitute the basis for the new structure. Despite the fact that the global economy changes are forming the new economic structure, the growth of social welfare still remains the main task of every economy.

Thus the conceptual difference is that the capital strengthening and growth of public welfare shall go on in connection with stability retention and natural systems' quality maintenance. Within the context of this scientific view the new economy – the happiness economy is being formed. Within the frame of this article we are trying to compare the GDP and various happy indices' interpretations.

Keywords: gross domestic product, happy index, domestic regional product, happiness.

INTRODUCTION

As of today the economy is using the broad range of necessary measuring tools, including the GDP, the indices of consumer prices, interest rate, monetary aggregate, exchange rate and unemployment level. While the general public may consider these tools to be the view of the current economic reality, the economists admit that they are in fact the approximate, estimated indices, developed in order to represent the economic reality rather than exactly measure it.

RESEARCH BODY

The GDP (or the real national income) was for the first time mentioned in the works of Hicks (1940) and Pigou (1962). The national income or GDP has two interpretations: that of production possibility frontier and the level of economy's social wealth. In the interpretation of GDP social security, the nation is viewed as a person.

The gross domestic product and related concepts (such as real GDP, per capita GDP, GRP etc.) are incomplete because they do not consider a lot of production activity types, not included into the GDP (for instance, shadow markets are not taken into account).

Though the GDP and related concepts are useful in the process of cross-country comparison, they are not the ideal indicators for welfare measuring. The GDP does not consider such essential constituents as recreation, environmental protection and human health. Let's

consider the simplest questions: Are the expenditures on armaments equivalent to investments in education or health care services? Are the additional units of income for the richest individuals equivalent in value to the unit of income earned by the representative of the poorest? Is the cost of 100 roubles of renewable energy equivalent to the cost of 100 roubles of non-renewable fossil fuels? According to GDP, the answer to all these questions will be "yes" (Jacobs and Slaus, 2010).

One should not forget that the GDP was developed as a market activity indicator during the Great Depression and as a planning tool during the World War Two, when the primary objective of the Government was to encourage the industrial production. Further, during the war, it has become the official instrument of the US economic policy. Further on (in 1946) the index, initially planned to be used as a production growth index started to be considered the synonym for promotion of economic activity, national health and public welfare, quantity and quality of growth, short and long waves (http://www.oecd.org/site/progresskorea/globalproject/41684236.pdf).

At the beginning of the 1970s William Nordhaus and James Tobin have again reminded us that the GDP has never been intended to serve as welfare criterion. In one of his last speeches the Senator Robert F. Kennedy spoke about the GDP as follows: «We can not measure national achievements in terms of GDP, as the GDP does not include air pollution, cigarette advertising and the value of ambulance cars, clearing our main roads after the war. It includes door locks in prisons for law breakers. The GDP grows with the increase of nuclear warheads production. It does not include the health of our families, the quality of their education; it is indifferent to the safety on our streets… In a word, the GDP measures everything, except for those things which make our life meaningful» (Henner, 2008). Though this point of view was ignored and at present the measuring is actually done with regard to quantity, which leads to concealing and distorting rather than showing and explaining.

Table 1
DISADVANTAGES AND ADVANTAGES OF THE GDP

Disadvantages	Advantages
1. The GDP makes no distinction between the factors, contributing to social progress and the factors, which can in fact make it worse. The GDP considers the acts of God, divorces, crimes and wars as economic benefits, for example, mass expenses for humanitarian assistance and for infrastructure rehabilitation after hurricane Katrina.	1. The GDP gives clear objectives for policy development and decision-making.
2. The GDP, the measure of flow activity, is erroneously treated as a measure of wealth.	2. The GDP gives estimation of the wide range of business activity in the context of common denominator. After price-level adjustment on account of inflation, it is possible to compare it in the course of time. After adjustment of differences in the cost of living in different countries, it allows for comparison between the countries.
3. The GDP includes some forms of economic activity which consume more capital than they produce (E.g., the non-renewable resources consumption).	
4. The GDP does not differentiate between stable and unstable activities.	3. The GDP is based on data, which can be easily collected on the national level, which permits to reduce the time of data collection and endure its proper and timely performance. Simplicity, universality, simplicity of use and timeliness are the obvious advantages of the GDP.
5. The GDP ignores the influence of unemployment on human safety and welfare.	
6. The GDP does not account for profits distribution.	
7. The GDP does not manage to differentiate between the speculative gains in the financial markets and the real income from increase in employment, production and personal	4. Due to the GDP it is easy to exactly specify changes in the base areas, such as

consumption. 8. The GDP measures only those products which are produced and sold in the legally registered markets. 9. The GDP and other price indicators on its basis are understating the real improvements in the living standards of the population, because they measure only the cost of goods and services, while ignoring real and often substantial improvements in the sphere of product quality and life quality.	consumer expenditures, housing expenses, expenses for electronic products, transport and telecommunications. 5. The GDP serves as an indicator of short-term changes in economic activity.

One of the GDP's serious critical advantages is the blatant disregard of income distribution. Over the recent decades the income inequality has increased, in many cases rapidly, in most countries all over the world. According to the IMF, in October 2014 the Russia's per capita GDP amounted $ 8447, which corresponded to 72nd place in the world, that was a bit lower than Turkey (64th place, $ 9 2901) and a bit higher than the CIS countries (e.g., Byelorussia – 81st place, $ 6583); Bulgaria (82nd place, $ 6582). The leading positions were occupied by Luxembourg (1st place, $ 103187), Switzerland (2nd place, $ 82 178), Qatar (3rd place, $ 78 829), Norway (4th place, $ 76 266), the USA (5th place, $ 55 904) (http://www.imf.org/external/pubs/ft/weo/2016/01/weodata/).

However, there exist explicit differences between the so called subjective indices and the GDP index. At the same time, according to the Happy Planet Index (World Happiness Report), Russia is on the 64th place, Turkey – on the 76th, Qatar – on the 28th (Helliwell et al., 2016).

Perhaps, the GDP growth was fully functional in the industrial economy as the indicator of pursued policy soundness, but in terms of postindustrial economy it can no longer be such an efficient indicator. Anyhow, the mathematical abstractions of the economics, traditionally pursued by governments of most countries, have nothing to do with the life of the real people, and more and more scientists currently tend to think that the countries should compare the happiness of their people rather than strength or wealth (Shmatova and Morev, 2015).

Scientific studies of subjective well-being appeared in the 1960s in psychological studies (where the focus was on measuring and explanation of «happiness» category as a state of mind) and in economics (where the focus was on making welfare function, including weight assigning).

The term Gross National Happiness was introduced by the fourth king of Bhutan Jigme Singye Wangchuk in the 1970s. This concept implies that sustainable development shall adopt coherent approach to the concepts of progress and attach equal importance to non-economic aspects of welfare. The term GNH is based on sustainable economic development, environmental protection, propaganda of national culture and efficient management (Frey and Stutzer, 2003).

In the years since, these branches were increased by nine subbranches, in order to develop the broader understanding of the GNH and cover the complete range of meanings of the GNH. As of today, the GNH is a multivariate index, built on the basis of reliable multivariate methodology, known as Foster Method, consisting of 33 indicators in nine spheres, aiming to emphasize various welfare aspects and various ways to satisfy the fundamental human needs. These indicators are statistically significant and normatively important, the weights in different spheres are the same. Inside of each sphere, the objective indicators have more weight while the subjective ones are given less weight. The nine domains: psychological wellbeing, health, education, consumption, cultural diversity and sustainability, efficient management, viability, ecologic diversity and sustainability, living standard. The domains are one of constituents of

Bhutan's population welfare, and the term «welfare» is here related to «good life» conditions fulfilment, according to values and principles, set forth in the Gross National Happiness Concept.

In the course of survey conducted in 2010 (involving 7142 respondents) the following key results were obtained:

- The men are on the average happier than women.
- In urban areas 50% of people are happy; in rural areas this indicator reaches 37%.
- The level of happiness is higher among people with elementary education or higher, than among those, who have no formal education, though higher education does not have too much influence upon the GNH.
- The happiest people are by profession civil servants and monks. It should be also noted that the unemployed are happier than corporate employees, housewives or farmers.
- Unmarried people and young people are among the happiest.

Besides, one shall take into account the numerous indices published by domestic scientists. Due to the fact that these are regional peculiarities that are of greatest value during happiness studies, their research shall be more thorough.

The considerable contribution to the welfare problem studies was made by the Soviet scientists – A.G. Aganbegyan, T.I. Zaslavskaya, V.F. Mayer, G.S. Sarkisyan, B.M. Sukharevskiy, S.G. Strumilin, Ye. I. Kapustin, P.S. Mstislavskiy, N.M. Rimashevskaya, V.M. Rutgaizer, S.P. Figurnov and others. It is worth emphasizing that the Soviet scientists focused more on public welfare, rather than on individual. In doing so they proceeded from the fundamental economic socialist law – promotion of the greatest measure of welfare and all-round development of all the members of society.

One of research lines currently lies in the sphere of adequate city planning. But these ratings and indices of cities and constituent entities of the RF measure only separate spheres in the context of sustainable development; include other research targets or have other objectives. In particular, the ecological rating of Russia's cities, made by the RF Ministry of Natural Resources, covers the environmental issues only; the rating of socioeconomic status of the RF constituent entities, made by "Ria Rating" rating agency evaluates the situation in the RF regions, not in the towns, and covers mainly the economic indicators, and the limited number of social indicators. The rating of the urban living environment' attractiveness, established by the Russian Union of Engineers, despite the broad coverage of the various aspects of urban life, uses, among other, the secured data sources, which complicates work with it. The closest (from the point of view of ideology) integrated rating of Russia's hundred largest cities, made by the "Urbanika" Institute together with the Russian Union of Architects, evaluates the quality and cost of living and records the status as of the current date.

It is obvious that just as the GDP does not give a view of the current situation, so the regional indices can not detect this relationship. We tried to establish the correlation relationship between the GRP and the happy index (the data was taken from the "Happy Index of Russian Cities" survey, conducted by News Effector together with "Russia's Regions" Regional Studies Fund). The survey involved 26 900 respondents from 100 biggest Russian cities. Respondents answered the following questions: «Are you satisfied with your material standing? Are you satisfied with the city's ecology? Do you feel safe in your city? Are you satisfied with your city's development dynamics? Are you satisfied with the level of city's public amenities provision? Do you feel happy in your city?». It turned out that the happiest people live in Grozny, Tyumen, Kazan, Surgut, Krasnodar, Sochi, Nizhnevartovsk, Novorossiysk and Belgorod. According to

survey results, Moscow occupied the 52nd position, St. Petersburg – the 16th, Yekaterinburg – the 49th.

The analysts came to a conclusion that the level of material welfare is the essential but not the determinative factor, influencing the happiness of Russia's citizens (fig. 1). The equally important criteria are such indicators as ecology, safety level and feeling of turn for the better. For this very reason, taking into account good ecology and citizens' high estimate of city's development dynamics, Grozny came out on the rating's top. And Moscow, despite of high income level and good level of city's public amenities provision, has shown quite a low result against such parameters as ecology, feeling of safety and dynamics of development, which all in all negatively influenced the sensation of happiness. (http://www.grossnationalhappiness.com/SurveyFindings/Summaryof2015GNHIndex.pdf)

Figure 1
THE CORRELATION BETWEEN GDP AND HAPPY INDEX
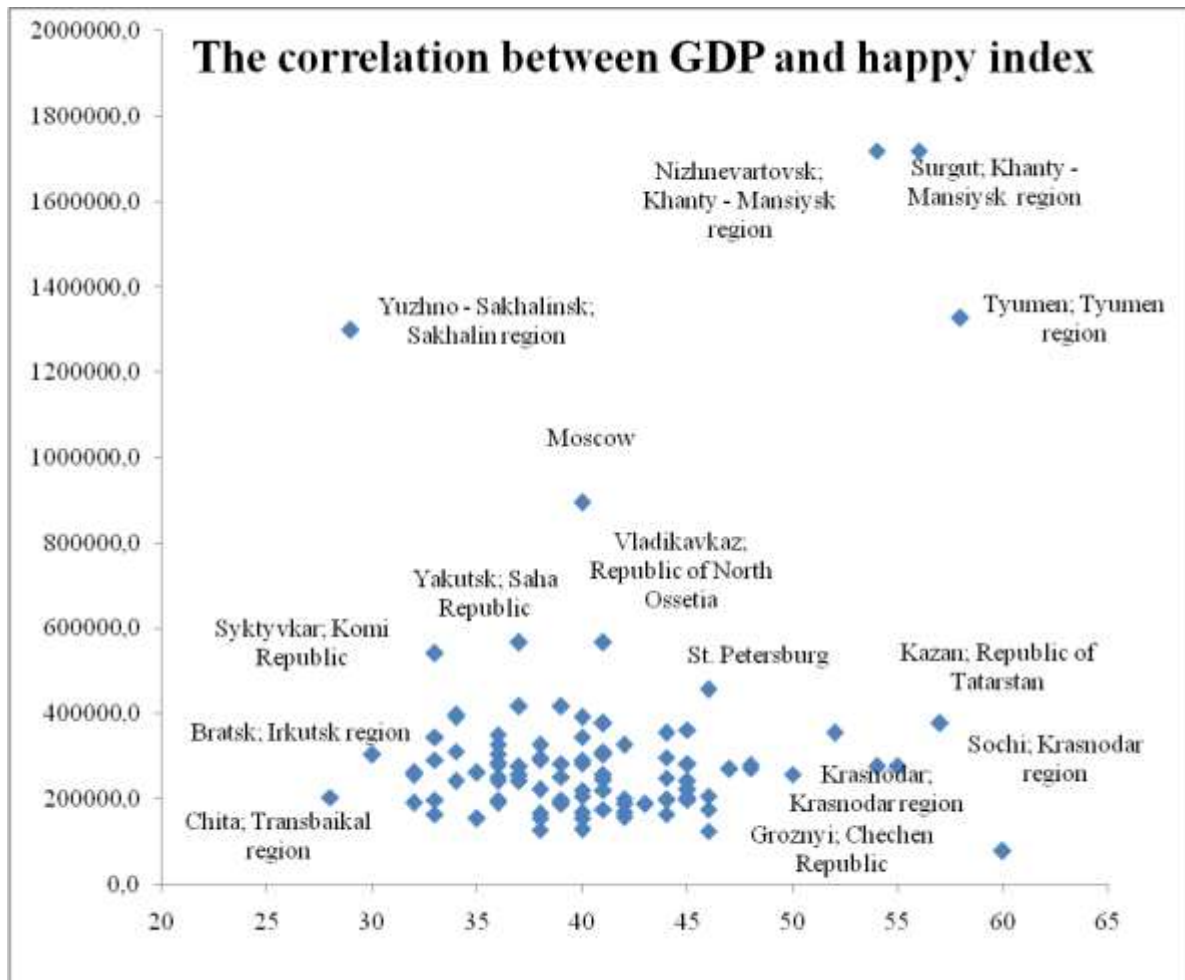
Thus, the "engine" of social processes and economy is the gap between the current and the desired living standards, and this "engine" is "started" by establishing the new consumption standards or their dissemination in social groups and territories (Zubets, 2007).

CONCLUSION

The high level of inequality is related to the wide range of social ills. The studies conducted in the USA demonstrated that countries with high level of inequality in income distribution also had higher unemployment figures, high rate of imprisonment, higher percent of welfare- and food stamps recipients, and higher percent of persons without medical insurance. It is the difference between the rich and the poor, rather than the average income in the country, that is the best predictor of these problems, as it was proved above. Besides, in the countries with high income distribution inequality less number of people invest in education thus having lower figures of completed formal education, poorer performance, a considerable number of children with low birth weight, higher rate of serious crimes including murders, crimes of violence, higher number of the disabled employees, as well as high percent of inactive population.

At the same time, the income inequality is considerably lower in the developed countries, such as Germany and Japan, Finland and Switzerland – the countries with the highest happy indices. On the international stage the high inequality level is also connected with the lower level of economic growth, decrease of life expectancy, academic performance decrease, crime rate increase, high corruption rate and economic instability increase, as well as low level of human capital development (Arrosa and Gandelman, 2016). Wilkinson and Pickett have found out that social and health problems were higher in the countries with higher inequality level. Countries with the same level of per capita income differ in level of health care services and social problems due to differences in income distribution. Income inequality is the more exact problems' predictor than the actual income level (Talberth et al., 2006).

Besides, neither of existing happy indices does not take into account the ethnocultural peculiarities of national values of rating-included countries, and in the meantime, the nations' concepts of happiness can not develop out of the cultural context.

One more problem is that all these alternative indices can not be calculated as promptly and regularly as the GDP indicator, generally accepted as of today. The common and generally accepted happiness research methodology does not yet exist, and it will hardly sometime appear, as: many men – many minds. How can the happiness be measured if nobody yet knows what it is. According to one of the researchers' estimate, there currently exist … scientific definitions of this concept!

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ANALYSIS OF THE STABILITY OF THE RUSSIAN BANKING SECTOR

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ABSTRACT

According to the results of the conducted research the banking sector of Russia is experiencing an acute need for large-scale processes, namely, the consolidation and the consolidation of existing commercial banks. Hence, one of the main requirements consolidation of commercial banks, would be carry out mergers and accessions, which, in our opinion, remain one of the main instruments of development of the banking sector and its structural changes.

Keywords: banking sector, indicators of sustainability, commercial banks, structural changes.

INTRODUCTION

The issue of creating a sustainable banking system is of particular importance in conditions of the crisis phenomena in the Russian economy: decline in world oil prices, fall of ruble, imposition of economic sanctions against Russia, etc.

THE MAIN PART OF THE STUDY

The stability of the banking system is considered according to several criteria in accordance with which there are the following kinds: financial; economic; political; moral; activities; operating; time; personnel; organizational (Banking system in modern economy, 2012).

We are interested in the necessity of statistics indicators of financial stability which was recognized by the international community as a result of bank and savings crises of the 1980s and beginning of 1990-ies in the United States (Borio, 2003). In 1999 the international Monetary Fund and the World Bank initiated the development of such indicators in the Financial Sector Assessment Program, the so-called FSAP. In addition, the IMF conducted a survey of central banks and other regulatory authorities of different countries to determine the indicators, the most important and tracked in the monitoring of systemic risk in the financial system and banking sector. These indicators are called "financial soundness indicators". (FSI's). (Carson and Ingves, 2003; Compilation Guide on Financial Soundness Indicators, 2004; Evans et al., 2000) In a further survey conducted by the IMF on the preparation, use, and dissemination of indicators of financial stability among the 142 States, showed that all respondents attached a high importance of indicators of capital adequacy,asset quality and profitability. (http://www.imf.org/external/index.htm) Indicators of liquidity and sensitivity to market risk considered less useful, particularly the respondents from industrialized countries, because of their ambiguity or the complexity of the calculation. The list of financial soundness indicators meets the following criteria: focus on major markets and institutions; analytical significance;

revealed usefulness, reflected in high ratings on the results of research; availability. (Sundararajan and Luca, 2002)

According to a study by the bank for international settlements, on formal grounds we can distinguish four broad categories of system diagnostics of financial stability: 1. rating system of banks, 2. system financial ratios and group analysis 3. comprehensive system of assessment of banking risks, and 4. the statistical model. (Sahajwala and Van den Bergh, 2000)

The policy of the bank of Russia dated 16.01.2004 No. 1379-У "On assessing the bank's financial stability to recognize it sufficient for participation in system of insurance of contributions" is one of the main techniques used in Russia and allowed to generalize the result based on operational data analysis in the form of bank statements. [9] There are following main groups of indicators of evaluation of financial stability of bank: the group of indicators for assessing capital, assets, quality of management of the bank, its operations and risks, profitability, liquidity.

At the same time scientists and researchers focus on internal and external factors affecting the stability of the banking system. So, scientists Koltsova N. V. and Savderova A. F. refer to the key factors - the quality of banking supervision; the level of creditworthiness of the enterprises of the real sector of the economy; the low liquidity of bank assets; the banks holding risky credit policy; economic condition of the industry; stability of the national currency and economic policy. As a significant factor of sustainable development of credit institutions allocated their perfection of legal regulation. Hence, in their opinion, increasing the sustainability and stability of the banking system should occur primarily through the creation of a number of legislative norms, contributing to the overall economic security. (www.cbr.ru)

In the opinion of O. I. Lavrushina, the stability of the banking system, the paramount influence is rendered by internal factors to be considered in the context of the expansion and modernization of economic activities of banks. These include: the choice of strategy, priorities in the development and forecasting of financial resources; increases in both the qualitative and quantitative parameters of banking activities; the ability to mobilize financial resources; the ability to avoid risks; cost savings; marketing and quality management; a guide to the development of modern banking technologies; the organization of the bank. (Banking system in modern economy, 2012)

A significant number of modern foreign researchers estimate the impact of various socio-economic factors on the financial stability of the banking system. For example, the predominant influence of the quality of financial reporting and disclosure in banking contracts on the stability of the banks considered in the study Acharya V. V., Ryan, S. G. (Koltsova and Savderova, 2013)

The impact of policy decisions on the stability of the banking system in the U.S. is studied by Rousseau P. L. Here we prove the adverse role of populist ideologies and relevant political solutions as the main causes of banking instability. (Acharya and Ryan, 2016)

We will analyze the stability of the Russian banking sector for the period 2010 - 2014 using the following groups of indicators: group of indicators of asset valuation; group of indicators for assessing capital, group of indicators of an estimation of profitability; group of indicators for assessing liquidity.

To calculate these metrics we use a number of formulas that appear in monographs of Gerasimova E. B. (Rousseau, 2016) Performed calculations of the dynamics of assets, capital and profits of the banking system displayed in table 1.

Table 1
FINANCIAL SOUNDNESS INDICATORS OF THE BANKING SYSTEM OF RUSSIA, TRLN.RUB
(www.cbr.ru)

Indicators	Period					Absolute changes		Relative changes, %	
	2010	2011	2012	2013	2014	2014 to 2013	2014 to 2010	2014 to 2013	2014 to 2010
Assets	45,58	49,01	49,51	57,40	58,90	1,50	13,32	2,61	29,21
Capital	5,41	5,48	6,09	7,60	7,81	0,21	2,40	2,76	44,27
Credits	34,51	34,34	34,00	27,70	24,55	-3,15	-9,96	-11,37	-28,86
Loans	0,92	0,97	1,00	0,90	0,94	0,04	0,02	4,44	2,01
GDP	60,73	61,35	62,60	66,70	71,23	4,53	10,50	6,79	17,28
Assets to GDP	1,33	1,25	1,26	1,16	1,21	0,05	-0,12	4,07	-9,23
Profitability of assets	2,02	1,98	2,02	1,57	1,60	0,03	-0,43	1,78	-21,05
Profitability of capital	17,02	17,70	16,42	11,84	12,04	0,19	-4,99	1,64	-29,29
Share of credits in assets	75,71	70,06	68,67	48,26	41,68	-6,58	-34,03	-13,63	-44,95
Profitability of credits	2,67	2,82	2,94	3,25	3,83	0,58	1,16	17,85	43,40

The table shows that most indicators of financial stability in the banking sector tend to rise. Thus, the total assets of the Russian banking sector increased during the study period in absolute terms by 13.32 trillion rub. in relative by 29.21 % and amounted at the beginning of 2015 of 58.9 trillion rub. It is due to the fact that the Russian government realizes measures for financial assistance to the Russian banking sector. For example in 2014.The Russian government has allocated for the recapitalization of the banking system 1 trillion rub. The Prime Minister D. Medvedev noted that support could be provided to banks whose capital is not less than 25 billion rub. However, in the Russian Union of Industrialists and entrepreneurs has proposed to set a minimum value of banks ' assets to 10 billion as the capital base of 25 billion rubles has only four or five financial institutions. (www.raexpert.ru)

The increase of the financial sustainability indicators cannot serve as proof of the stability of the banking system due to the possibility of low quality assets. Practical experience shows that low or questionable quality of assets is the most common cause of bankruptcy of the commercial banks, therefore, it is necessary to continuously assess the quality of assets, the main attention is paid to the lending transactions and investments in securities. Then it is possible to predict the stability of the bank and in a timely manner to mitigate key risks.

Relative to the forecasted values for 2016 it is assumed a very modest growth of assets of the Russian banking sector only for 2%, excluding exchange rate changes and a decrease of 3%. (www.raexpert.ru)

Total capital of banking sector increased during the study period in absolute terms by 2.4 trillion rub. in relative to 44,27 % and amounted at the beginning of 2015 for 7.81 trillion rub. The growth of bank capital was accompanied by a decline in capital adequacy and profits and funds are main source of growth of total bank capital.

Total credits of the banking system of the Russian Federation have decreased during the study period in absolute terms by 9.96 trillion rub, a relative by 28.86 % and amounted at the beginning of 2015. 24,55 trillion rub.

The dynamics of indicators of financial stability of the Russian banking system during the analyzed period is presented in figure 1.

Figure 1
DYNAMICS OF INDICATORS OF FINANCIAL STABILITY OF THE RUSSIAN BANKING SYSTEM, TRILLION RUB
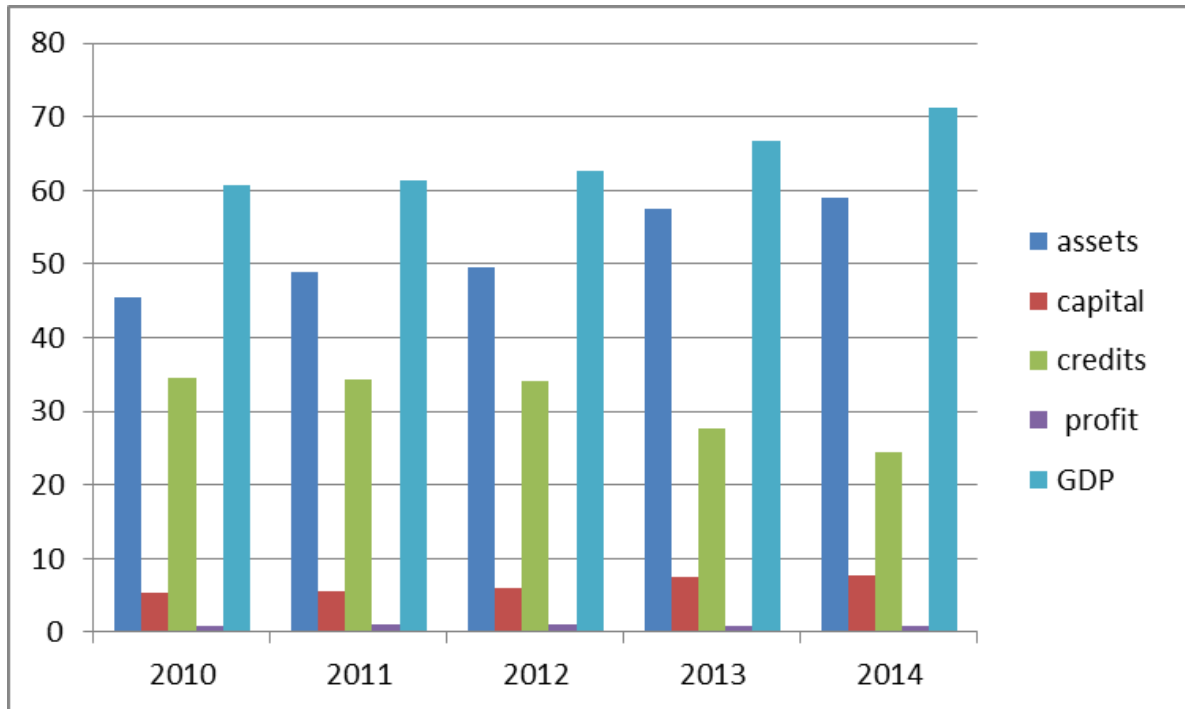
Dynamics of profitability indicators is presented in figure 2.

Figure 2
DYNAMICS OF INDICATORS OF PROFITABILITY OF THE BANKING SYSTEM OF THE RUSSIAN FEDERATION, %

This figure shows that the capital profitability index has decreased over the study period by 4.99 %, driven by higher growth of the aggregate capital of the banks in comparison with the growth rates.
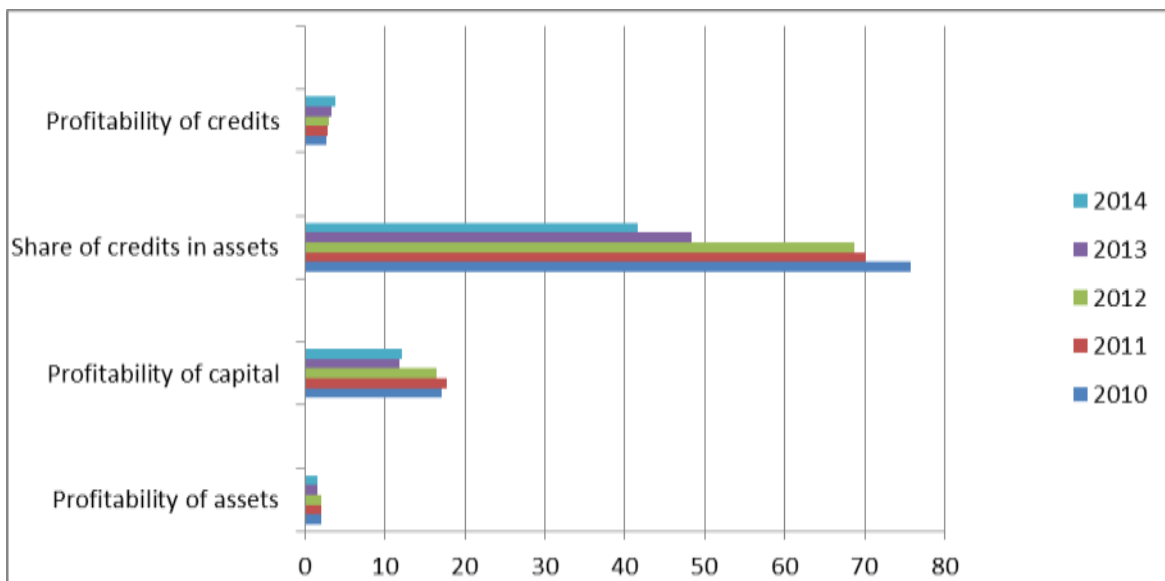
Return on assets also decreased at the beginning of 2015 of 1.6%. The reason for this was the higher growth rate of total assets of banks compared to the growth rates. Accordingly, the growth of assets made during the study period of 29.21 %, and earnings growth is 2.01 %.

In turn, the profitability of loans increased by 1.16 % and amounted at the beginning of 2015 3,83 %. This was influenced by negative growth rates of loans, but rather the decline in total bank loans from 34.51 billion rub. in 2010 to 24.55 trillion rub in 2014, compared to positive earnings growth is 2.01 % for 2010 – 2014.

Thus, the total asset of the banking sector of the Russian Federation for 2010 - 2014 has grown by 29.21% and 58.9 trillion rub.

The slower growth of bank assets in 2014 is due to the general slowdown in economic growth. Firstly, it is the deterioration of the creditworthiness of the borrowers and poses a threat of accumulation of bad debts on banks ' balance sheets, both retail and corporate sectors. Secondly, the slowdown of economic dynamics and reduction of population's savings, which in turn limits the growth of banks ' liabilities.

Policy of the Central Bank for "clearance" of the banking sector generates nervousness in the market, contributes to the flow of funds from medium and small banks to large banks, primarily in the state.

The tense situation in Ukraine also has a negative impact on the largest Russian systemically important banks that have Ukrainian subsidiary banks (Sberbank, VTB, Vnesheconombank), either directly lend to Ukrainian borrowers (Gazprombank).

Further, in table 2, consider the distribution of the assets of the largest banks. This table shows that by the end of 2014 in the five largest banks, namely Sberbank, Bank VTB,

Gazprombank, Rosselkhozbank, VTB-24, concentrated more than half (54,32 %) of total bank assets.

<p style="text-align:center">Table 2
DISTRIBUTION OF THE ASSETS OF THE LARGEST BANKS, % (http://bankirsha.com)</p>

Indicator	Period					Absolute changes	
	2010	2011	2012	2013	2014	2014 to 2013	2014 to 2010
The assets of 5 largest banks (Sberbank, VTB Bank, Gazprombank, Rosselkhozbank, VTB-24)	50,99	50,49	51,00	51,40	54,32	2,92	3,33
Assets of other banks	28,47	28,50	29,08	30,05	28,20	-1,85	-0,27
Assets of banks occupied 6 - 20 positions	18,43	19,40	20,00	19,20	18,90	-0,30	0,47

Thus, the increase by 2015 the share of the largest banks in the assets occurred at the expense of smaller banks. In this period the bank of Russia has intensified the process of clearing the banking sector and revocation of licenses. The meaning of the process, as claimed in his interview the Deputy Chairman of the Bank of Russia M. Sukhov, the increase of confidence in the banking sector by maintaining market sustainable and fair players. The aim is not simply the elimination of the market do not meet the definition of institutions, but also increasing responsibility of their management and owners to ensure the normal functioning of the banks.

Analyze the net income and expenses of the banking sector in the structure and dynamics for 2010 – 2014 are displayed in table.3.

<p style="text-align:center">Table 3
NET INCOME AND EXPENSES OF THE BANKING SECTOR IN THE STRUCTURE AND DYNAMICS, TRILLION RUB</p>

Indicator	Period					Absolute changes		Relative changes, %	
	2010	2011	2012	2013	2014	2014 to 2013	2014 to 2010	2014 to 2013	2014 to 2010
Income from operations with foreign currency	0,14	0,15	0,15	0,11	0,11	0	-0,03	0	-23,63
Income on operations with securities	0,38	0,37	0,38	0,37	0,35	-0,02	-0,03	-5,41	-6,95
Commissions	0,3	0,3	0,31	0,32	0,39	0,07	0,09	21,88	31,01
Interest income on operations with physical persons	0,5	0,56	0,58	0,61	0,68	0,07	0,18	11,48	35,7
Interest income on operations with legal persons	1,22	1,26	1,25	1,26	1,23	-0,03	0,01	-2,38	0,44

Other income	0,11	0,12	0,12	0,13	0,13	0	0,02	0	21,59
TOTAL income	2,65	2,76	2,79	2,8	2,89	0,09	0,24	3,21	9,03
General and administrative expenses	0,75	0,76	0,77	0,86	0,85	-0,01	0,1	-1,16	12,77
Reserves for possible losses	0,65	0,67	0,68	0,69	0,76	0,07	0,11	10,14	16,39
Other expenses	0,33	0,35	0,34	0,35	0,34	-0,01	0,01	-2,86	2,12
TOTAL expenses	1,74	1,78	1,79	1,9	1,95	0,05	0,21	2,63	12,09
Financial result	0,91	0,98	1	0,9	0,94	0,04	0,03	4,44	3,2

Thus, the retail lending sector is the main driver of growth in banking income in 2014. Total net interest income on operations with individuals is 0,682 trillion rub. and has grown by 11.48% compared to the previous year. The growth of this index is associated primarily with the growth of interest rates on loans offered to individuals.

Net interest income on operations with legal entities totaled 1,256 trillion rub. thus, in 2014 declined by 0.03 % in comparison with 2013. Decrease due to the decrease in the activity of legal entities on loans from banks, which in turn is due to the instability of the economic development and financial crisis in the country.

Net income from operations with foreign currency has not changed in 2014 and was 0.11 trillion rub. Invariance of this index is due to a stable demand for foreign currency.

Thus, the formation of reserves for losses and organizational management costs became a major factor in the decline of financial result of the banking sector in 2014 compared with 2012.

The volume of provisions for losses in 2014 amounted to 0,763 trillion rub. 0.07 per cent higher than in 2013. Reason for the increase of the provision for losses was the increase of the financial result of the banking sector in 2014 by 4.44 % (to 0.94 trillion rub.) in comparison with 2013 year (0.9 trillion rub.).

Currently, the financial stability of the Russian banking sector has a number of serious problems, despite some progress. The main reasons for reducing the financial stability and liquidity of banks are the following: low level of capitalization of the banking sector; a small proportion of long-term resources; the desire of banks to maximize profits to the detriment of financial stability; a decrease in the efficiency of banking risk management. (Gerasimova, 2014)

The basis of the financial stability of the banking system in general and the commercial bank in particular is private capital, the regulation of which must be in accordance with international requirements. It is impossible to analyze the sustainability of individual banks without identification of the dynamics of development of the banking sector as a whole.

The increase of financial results of the banking sector directly depends on growth of capital. Therefore, the sustainable dynamics of growth of capital is the most important factor in increasing banking sector resilience.

CONCLUSION

Thus, the banking sector of Russia is experiencing an acute need for large-scale processes, namely, the consolidation and the consolidation of existing commercial banks. At the beginning of 2015 the capital adequacy of credit institutions ranged from 10.5% to 27.6%, with the average for the banking system is 12.6%.

Hence, one of the main requirements consolidation of commercial banks, would be to carry out mergers and interconnections, which remain one of the main instruments of development of the banking sector and change its structure.

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FORMATION OF THE ORDER STRUCTURES IN THE NON-EQUILIBRIUM ECONOMIC SYSTEMS

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ABSTRACT

The purpose of this article is to define the types of order, referred to as the order structures formed in the non-equilibrium economic systems, to identify the relevant factors and to assess the prospects of development of the non-equilibrium systems. The study is based on the use of methods and tools of the nonlinear dynamics theory and the comparative analysis method. The analysis is carried out on the example of the Russian economy compared with the economies of Poland and the United States. It is shown that the fundamental difference between the order structures formed in the non-equilibrium systems and the states of general or partial equilibrium is determined by the differences in the behavior of economic entities, which is usually not rational in practice, as it is supposed by the equilibrium approach, but limited-rational. We built the phase trajectories of the economic systems of the aforementioned countries. We identified and characterized all types of existing and emerging order structures here. The conclusions emphasize: the objective nature of the formation process of the order structures in the non-equilibrium systems; the transient nature of these structures defined by the type of the existing non-equilibrium; the presence of a combination of factors that impede a transition of the Russian economy on the trajectory of sustainable development.

INTRODUCTION

Most of the possible order in the economic system, as we know, corresponds to the state of general economic equilibrium according to L. Walras, which is characterized by the total balance of all markets of finished goods and factor markets. It shall occur simultaneously in all markets as a result of cumulative actions of economic entities, behaving rationally. As part of the equilibrium approach it is also considered that any economic system, regardless of its initial state, which can be characterized by a set of any non-equilibrium prices, will gradually approach to the position of general equilibrium. For this purpose the prices shall be recalculated at every stage and the transactions carried out on the non-equilibrium prices shall be canceled and re-concluded until the system comes in the desired state. Under these conditions, the approach process is convergent (Valras, 1954). In addition, the economy efficiency is maximum in the state of general equilibrium, as it follows from the researches of V. Pareto (Pareto, 1971) and P. Samuelson (Samuelson, 1947).

However, it is slightly different in the real economy system, unlike its model, where both the convergence parameters and the stable equilibrium conditions are established. Firstly, there is a large number of fatal factors preventing an achievement of the equilibrium state by the system: imperfect competition; information asymmetry; various forms of unemployment; inability to instant price changes; uncertainty of the utility functions, etc. Secondly, the key position of the general equilibrium theory and one of the baseline model conditions - the rational behavior of

market participants - is rare in practice. It is most often applied the limited rationality investigated by G. Simon (Simon, 1959), when the economic entity seeks not to maximum, but acceptable outcome. The ideas of G. Simon were developed by R. Selten, having showed that the economic entities were usually guided not by the maximization principle in the decision-making, but by the habits, imagination and logical reasoning (Selten, 1990), and were strengthened by H. Leibenstein, having established that the rational behavior was variable in general, depending on the physiological and social human nature (Leibenstein, 1976).

A major role in the study of this problem was played by the views and approach of J. Keynes (http://cas.umkc.edu/economics/people/facultypages/kregel/courses/ econ645/), which actually marked the beginning of a new direction in the study of the state of equilibrium in the conditions of imperfect competition economy and enabled to better understand the relationship of equilibrium and non-equilibrium in the economic development. On the basis of this approach, J. Hicks developed "IS-LM" model (http://la.utexas.edu/users/hcleaver/368/ 368hicksVCdemand.pdf), which made it possible to use the tools of IS curves, reflecting all valid options for partial equilibrium on real commodity market, and LM curves, characterizing all possible options of partial equilibrium in the money market, to analyze the state of macroeconomic equilibrium.

Thus, we can say that if the rational behavior of all economic entities provides a state of general equilibrium, corresponding to the maximum possible order of the system, then the limited-rational one leads to the formation of other types of order, which are intermediate compared to the state of general or partial equilibrium studied in detail by A. Marshall in due time (http://files.libertyfund.org/files/1676/Marshall_0197_EBk_v6.0.pdf), not excluding the possibility of the latter. The study of these types is relevant not only from the theoretical, but also from a practical point of view as it is directly related to the issues of economy efficiency. The importance of research is particularly increased in the conditions of transition to the market of Eastern European countries, including Russia, whose economic systems are very far from the general equilibrium.

METHODS

As a research method of order types (or order structures), which are formed in the non-equilibrium systems, it is used the methods and analytical tools of nonlinear dynamics theory. They are based on the provision that the development of any known processes, which take place in the socio-economic systems, can be described and analyzed in time with the help of relevant (generally nonlinear) differential equation system of the form:

$$\frac{dx}{dt} = F_i(x_1, x_2, ... x_n)$$,(1)

where x_i – variables that characterize the system state at the time t; i = 1, 2, …, n; n – number of variables (Milovanov, 2001; Milovanov, 2015).
However, because of the huge number of variables, the resulting equation systems cannot be analytically solved in most cases. Therefore, they firstly undergo a special production process, that is, a decrease in their dimension. Secondly, it is applied the methods of their qualitative analysis by constructing their phase portraits without a direct solution of the equations. The phase portrait is a graphical representation of any possible changes in the system expressed in the form of a set of trajectories on the phase plane, where the values of selected variables are laid off on the axes (https://www.youtube.com/watch?v=mc4573sjGxQ (2015)). In most cases such

portrait gives an indication of the order form, which develops in the system.

The equilibrium and non-equilibrium systems have correspondent different phase portraits. For example, it is more common for the first to have a stable node or focus in the portrait, representing a trajectory converging to a fixed point. And for the second - stable and unstable limit cycles in the form of a set of, respectively, unwinding or twisting trajectories and other (Figure 1).

Figure 1
EXAMPLES OF TYPICAL PHASE TRAJECTORIES
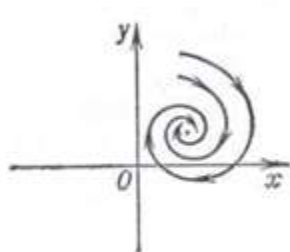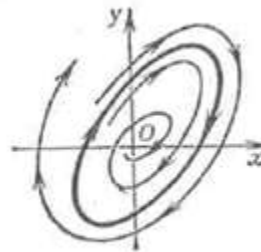
a) stable focus   b) unstable limit cycle

The phase portrait of any system, by virtue of the simultaneous action of a large number of factors, some of which cannot be accounted for in the model, can significantly differ from the standard and combine elements of different order structures. Therefore, to analyze them, it is important to isolate the individual further irreducible topological structures in the portrait and to compare them with the actual socio-economic processes, taking place in the system. There are also cases where the portrait analysis cannot give a unique solution or is controversial.

It should be noted that in many cases it is possible to make conclusions on the order type not only under the phase portrait, but also under the individual phase trajectories. Such trajectories are built in the phase plane under two key variables, which are taken in this article as the indicators of the gross domestic product and economic growth rates. (http://www.be5.biz/makroekonomika/gdp/gdp_russia.html; http://www.vestifinance.ru/articles/67006)

RESULTS

Taking into account the above, we will consider and compare the order types, emerging now in several countries with the significantly different economic and social characteristics, on the basis of analysis of phase trajectories.
We will receive the following picture for the Russian economy (Table 1, Fig. 2).

Table 1
**GDP OF RUSSIA IN 1990 - 2015 IN THE PRICES OF 1990**

Years	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
GDP in the prices of 1990, bln. USD	570.4	541.9	463.3	423.0	369.3	354.1	341.3	346.1	327.6	348.4
GDP growth rates in % to the previous year	-3.0	-5.0	-14.5	-8.7	-12.7	-4.1	-3.61	1.38	-5.35	6.35

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
383.4	402.9	422.0	452.8	458.3	516.2	558.3	606.0	637.8	587.9	614.4
10.05	5.09	4.74	7.25	7.15	6.39	8.15	8.54	5.25	-7.8	4.5

2011	2012	2013	2014	2015
640.6	622.6	671.3	675.3	649.6
4.3	3.4	1.3	0.6	-3.8

Note: compiled by the authors based on

Figure 2
THE PHASE TRAJECTORY OF RUSSIA ECONOMY IN 1990 – 2015
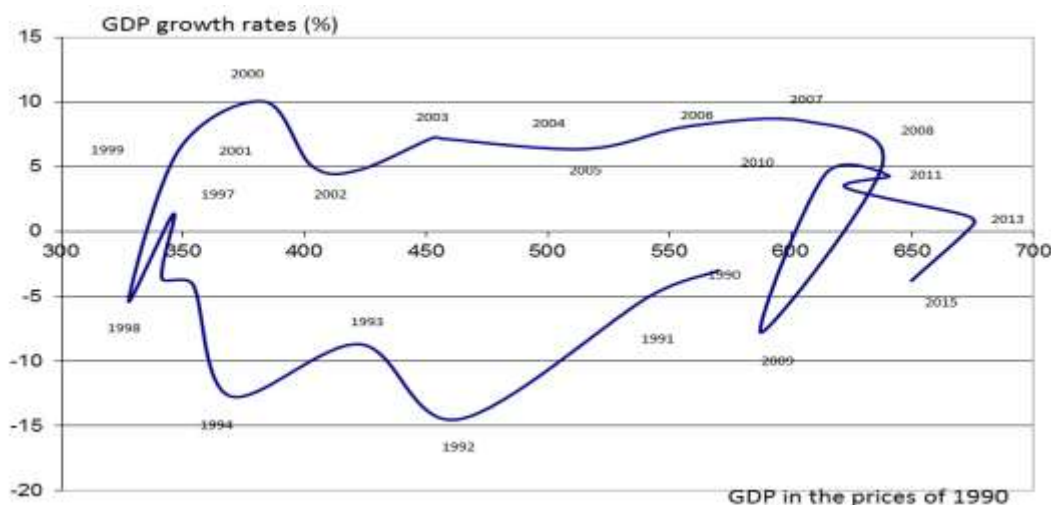
According to Table 1, it is built the phase trajectory of economic system of the Russian

Federation. A topological picture of the figure shows that during the analyzed period, the country's economic dynamics is ambiguous and contradictory in nature. The periods of the GDP indicator decline, for example, from 1990 to 1998, are followed by the periods of relatively strong growth, for example, from 1999 to 2008. At the same time both a decrease and an increase in the gross domestic product takes place at the same time expressed by the continuous fluctuation in the rate of its growth with large amplitude. (http://www.be5.biz/makroekonomika/gdp/gdp_usa.html; https://yandex.ru/images/)

It is advisable to select a number of different segments on the trajectory. Firstly, it is the segment from 1990 to 2003, which corresponds to the most difficult years of transition from the planned-centralized economy to the market one. Most of all it looks like a part of the unwinding trajectory of the forming unstable limit cycle. This cycle usually occurs in a system with the contradictory trends of development, for example, in a transition economy, which has actually taken place. In this segment there is most pronounced fluctuation of the economic growth indicator, varying from -14.5 to 10% with the sharp ups and downs, such as in the segment from 2006 to 2008, corresponding to the crisis of 1998. (http://www.be5.biz/store/wmr2013.html; http://www.tradingeconomics.com/poland/gdp)

The next segment is the part of trajectory from 2003 to 2007, which can be considered as a gradual passage of the system to a more balanced and sustainable development.
The third segment is the part of trajectory from 2007 to 2015, which resembles in its layout the branch of a stable limit cycle, which has begun to form, inherent, as a rule, to the market system. However, we see at the graph that since 2007, the beginning of the global financial crisis, and to the present time, it has been seen a distinct trend towards a slowdown in the economic growth in the Russian economy once again. Namely the trend, which is emerging more and more clearly, puts us on guard. Moreover, it is accompanied, as the statistical data analysis shows, by a deterioration of the industry structure, a decline in the production of investment purpose products - machinery, equipment, etc., as well as an increase in the economic dependence on the extraction and export of raw materials. One of the main internal reasons for the slowdown, as the analysis shows, is still weak sensitivity of the economy to the innovations (Khalabuda and Nikolaev, 2014; Postalyuk and Akhmetshina, 2014).

So, the overall picture of the phase trajectory, supported by the actual macroeconomic indicators, enables to suggest that the Russian economy has managed to overcome the most negative consequences of the transformation period and is gradually evolving to a more balanced market structurein the conditions of two financial crises. But this development is unstable. Thus, in 2015 Russia fell from the 45th place to the 73rd one, that is, for 28 positions, compared to 2014 in terms of the GDP indicator (in USD) per capita. These negative phenomena are determined, firstly, by the nature of today's raw export-commodity model of the Russian economy, and secondly, by the negative factors in the world politics and economic conjuncture. Their combined action will determine a specific new type of economic non-equilibrium and the nature of structural ordering of the economic system of the country in the future.

We construct and analyze the phase trajectory of the economy of the Republic of Poland, the transformation which was carried out in the transition period according to the scenario, which was significantly different from the Russian one (Table 2, Fig. 3).

Table 2
GDP OF THE REPUBLIC OF POLAND FOR 1970 – 2015

Years	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
GDP in the prices of 1970, bln. USD	27.7	29.8	31.2	32.5	34.8	36.9	39.8	42.6	44.9	46.6
GDP growth rates in % to the previous year	0	7.6	4.7	4.2	7.1	6.0	7.9	7.0	5.4	3.8

1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
43.8	39.5	37.6	39.7	41.9	43.4	45.3	46.2	48.1	48.1	42.6	39.6
-6.0	-9.8	-4.8	5.6	5.5	3.6	4.4	2.0	4.1	0	-11.4	-7.0

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
40.6	42.1	44.3	47.4	50.4	54.0	56.6	59.2	61.7	62.5	63.4	65.6
2.5	3.7	5.2	7.0	6.3	7.1	4.8	4.6	4.2	1.3	1.4	3.5

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
69.0	71.4	75.9	81.3	84.5	86.8	90.0	94.2	95.9	97.5	101.0	88.0
5.2	3.5	6.3	7.1	3.9	2.7	3.7	4.7	1.8	1.7	1.8	-1.6

Note: compiled by the authors based on (http://www.be5.biz/store/wmr2013.html; http://www.tradingeconomics.com/poland/gdp).

Figure 3
THE PHASE TRAJECTORY OF THE POLISH ECONOMY IN 1970 - 2015
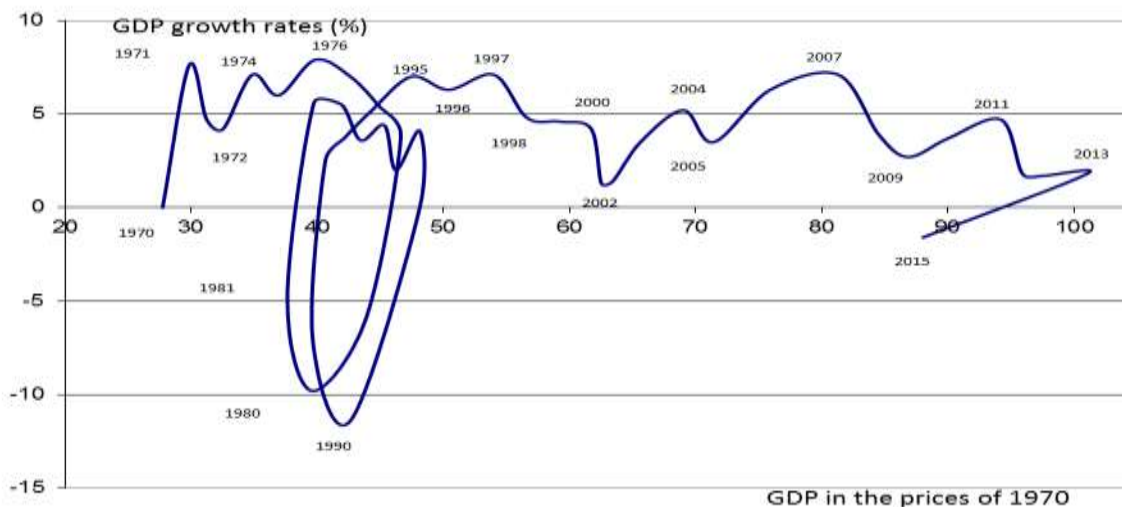
It is seen from Fig. 3 that even in 1975 – 1976, i.e., long before the transition to market, the Poland economy began to form an unstable limit cycle, which indicated some serious problems that it faced in these years. However, since 1997 the country has begun to come on the regime of sustainable economic growth with the cyclical rate fluctuations near the equilibrium trend that enables to suggest the market nature of development. The similar thing appeared in a phase picture of Russia only in 2003 - 2004.

This difference is due, firstly, to the fact that the transition to market has taken place here as part of the same state, while in Russia - against the backdrop of the collapse of the USSR and the unprecedented destruction of existing economic ties. Secondly, Poland has never had so rigid administrative-command system as in the USSR, and the Privatization Office has already been established in October 1989, i.e., almost immediately after coming to power of the non-communist government of Tadeusz Mazowiecki and by early 1994 the most important stage of the property reforming - the small-scale privatization - was almost complete. Thirdly, the privatization took place using the significantly different methods in comparison with Russia - commercialization and liquidation of enterprises.

We consider the phase trajectory of the US economy, which is the classic market system in contrast to Russia (Table 3, Fig. 4).

Table 3
GDP OF THE USA FOR 1970 – 2015

Years	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
GDP in the prices of 1970, bln. USD	1075.9	1111.4	1169.8	1235.9	1229.5	1227.1	1293.1	1352.7	1428.0	1473.3

GDP growth rates in % to the previous year	0	3.3	5.3	5.7	-0.52	-0.2	5.4	4.6	5.6	3.2

1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1469.7	1507.8	1479.0	1547.5	1659.9	1730.2	1791.0	1853.0	1930.9	2002.0	2040.4	2038.9
-0.24	2.6	-1.9	4.6	7.3	4.2	3.5	3.5	4.2	3.7	1.9	-0.074

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
2111.4	2169.3	2256.9	2318.3	2406.3	2514.3	2626.2	2749.2	2861.7	2889.6	2941.2	3023.8
3.6	2.7	4.0	2.7	3.8	4.5	4.5	4.7	4.1	0.97	1.8	2.8

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
3138.3	3243.2	3329.7	3388.9	3379.1	3285.3	3368.5	3422.4	3501.8	3579.6	3718.5	3836.1
3.8	3.3	2.7	1.8	-0.29	-2.8	2.5	1.6	2.3	2.2	2.3	2.3

Note: compiled by the authors based on [17].

It is possible that the information provided by the phase trajectory is not enough to make an unambiguous conclusion about the behavior of such a complex economic system as in the USA, but at a first approximation to the chosen variables, it is visible a picture of sustained economic growth in the figure (from 1970 to 2015 the GDP of the USA has increased in 16.7 times) in a continuous cyclical fluctuation near the equilibrium trend.

Figure 4
THE PHASE TRAJECTORY OF THE USA ECONOMY IN 1970 – 2015
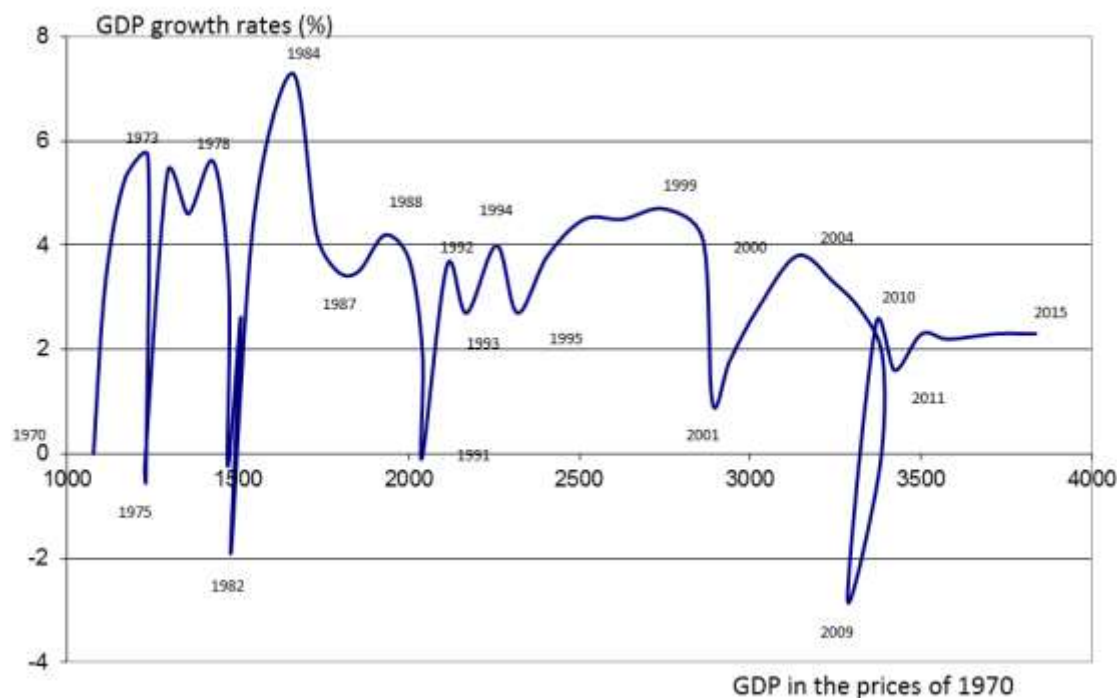
These fluctuations were the most pronounced in 1970-1990, where there was a deterioration of the reproduction conditions in a number of other developed countries. And the policy of "conservative wave", aimed at the structural and technological restructuring and weakening of direct government intervention in the economy, was carried out as a reaction to thisdeterioration(http://www.samomudr.ru/d/Rej%20R.%20%20_Ekonomika%20SShA%201970 -1980%20gg.%20i%20ekonomicheskaja%20programma.pdf1). As a result of these reforms, the economic growth was stabilized, which was easily visible on the phase trajectory for the respective period.

SUMMARY

This study enables to make the following conclusions.

1. In any economic system, there are formed their own unique qualities and order types (order structures) under the influence of the internal self-organization mechanisms, which are predetermined by the trends of preceding development and equilibrium, corresponding to this type. Thus,there are visible signs of the formation of an unstable limit cycle in the phase trajectory in the Russian economy in the period of 1990 – 2000, which is the most difficult stage in its development, associated with the collapse of the country.

2. Any existing order structure exists as long as the accumulation of quantitative changes in the system related to the organizational and economic changes and various reforms will not lead to a non-compliance of the form of this structure with the current non-equilibrium mode. For example, we see at the phase trajectory of the Russian economy that starting from 2003 - 2004 (after deepening of reforms and transformation of property relations), its picture is changed and there are the signs of emergence of the new order structures, corresponding to a market

system.

3. The Russian economy overcame the negative trends in 1990-2000 and the effects of the global financial crisis of 1998 and 2007-2009 not without difficulty, though it started to come to a more balanced mode of development, as evidenced by the new types of order, which started to form on the phase trajectory from 2003, but they were unstable and contradictory, and took place against the background of the trend towards the growth rate slowdown. This is due, firstly, to the operation of unpromising export-commodity model, preventing the processes of economy innovatization and improving its institutional structure, and secondly, the unfavorable factors of world politics and economic conjuncture. Namely this complex set of factors will determine the near-term prospects of the Russian economic system development, the nature of the emerging non-equilibrium type and economic order.

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