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CONTROL AS AN INSTRUMENT OF MANAGEMENT AND INSTITUTION OF ECONOMIC SECURITY

Elvir M. Akhmetshin, Kazan Federal University Vladimir L. Vasilev, Kazan Federal University

ABSTRACT

1. Introduction. The paper is relevant due to economic security level recession of the Russian economy in recent years. It is proposed to provide the interaction of socio-economic development indicators of the country and established control measures in the policy intended to improve the economic security of the country. It is proposed to use the institutional approach to solve the problem.

2. Methods. The main methodological basis of the paper is an institutional nature of economic relations that is expressed through an interrelated sequence of the following stages: institutions – motivation – control. In the paper, such research methods were used as the institutional approach, analysis and synthesis of historical data, the laws of dialectics, and a method of cause-effect relationships.

3. Results. This paper represents the author's recommendations for the transfer of external (negative) manifestations of control to internal (constructive) forces of cooperation. Control is disclosed as an institution necessary to provide economic security and as a condition for the effective implementation of the socio-economic strategy. The current economic security of the country is assessed on the basis of study of current macroeconomic indicators for the Russian Federation. Threats and causes of low economic security are formulated. The measures to address them are proposed.

4. Discussion. The institutional approach is known as one of the modern successful methods to describe economic relations. The problem of increasing the economic security is not solved. Increasing the effectiveness of the control measures to ensure the economic security using the institutional approach is necessary. The paper describes the theoretical and methodological basis for the study of the institutional mechanism (system of institutions) of economic security in order to increase the efficiency of monitoring the implementation of the system of institutions. A study of the properties and the nature of the institutions as recognized, purposeful and repetitive activity of economic agents aimed at the implementation and monitoring of the strategy to improve economic security is carried out.

5. Closing statement. Features of the institutional environment to provide economic security are revealed. The measures to improve the institutional chain of ensuring economic security of Russia through the effective functioning of the control system are proposed.

Key Words: Management, Control, System of Control, Economic Security, Institution, Institutional Approach, Institute Of Safety, Institutional Mechanism

INTRODUCTION

The study is relevant due to an increase in external and internal threats to economic security of Russia. Many of the problems of the Russian economy are still to be resolved. They are primarily the low competitiveness of Russian enterprises, the lack of high innovation activity, the dominance of primary industries, and inefficient monetary policy. Growth of socio-economic threats is also confirmed by macroeconomic indicators. After the crisis of 2008, the recovery growth of gross domestic product (GDP) in Russia in 2013 has slowed and made 1.3% compared to 3.4% in 2012. By results of 2015, the downfall in GDP to 3,8% was generally noted (Interfax, 2016). It is necessary to replace short-term anti-crisis measures and economic growth based on the sale of hydrocarbons with the effective long-term strategy of strengthening the country's economic security (Vasilev & Akhmetshin, 2014). It is obviously necessary to investigate and improve the control institution in the Russian economy.

There is an urgent need in the formation of economic security institutions based on the successful tools of modern socially-oriented market economy, to revise the content and improve the efficiency of a number of management functions and methods. The paper deals with the control system as the management tool which is the most adequate for the Russian transformational economy that role increases in the period of economic crisis. At the same time, the emphasizes in control activities change and the work aimed at the retention of the established system of parameters of the organization activity becomes clearly insufficient.

METHODOLOGY OF RESEARCH OF CONTROL FUNCTION IN THE ECONOMIC SECURITY SYSTEM OF THE COUNTRY

We understand the economic security of Russia as such a state of the economy that maintains an adequate level of social, political, and military existence and innovative development, invulnerability and independence of its economic interests in relation to possible external and internal threats and influences (Vasilev et al., 2013).

The control as an institution of economic security allows us to evaluate fulfillment of tasks, the achievement of the stated parameters (macro-economic, social, budgetary, commercial, competitive, cooperative, and forecasting).

The formation of an economic security indicators complex is described in many scientific papers and official documents. For example, in terms of national economic security there can be considered a "Concept 20/20" or the annual messages of the President of the Russian Federation to the Federal Assembly which contain the planned targets for growth of gross domestic product, population size and per capita income, gold and foreign exchange reserves, exports, innovation product and activity, reduce of inflation, unemployment, the monopolization, the informal sector of the economy, government and corporate debt, and other external and internal threats (Vasilev & Akhmetshin, 2014).

To analyze and control regional economic security, for example, in the Republic of Tatarstan, we have used the following complex of indicators: gross regional product in absolute terms and per capita income of the population, average expectation of life, amount of fixed investment, amount of foreign direct investment, the share of non-primary products, the share of small innovative enterprises, the share of small and medium-sized businesses, the number of jobs

created, the availability of transport infrastructure, and housing per capita (Gapsalamov, 2013), (Shorikov & Korshunov, 2014).

To control and evaluate the economic security of enterprises, it is possible to use traditional methods of financial analysis based on the calculation of financial stability, liquidity, and profitability factors. It is possible also to calculate the integral indicators of a company bankruptcy risk. For example, the well-known "E. Altman Z-factor".

As a result, any level of economic security (of a company, territory, country) requires a certain system of indicators which must be constantly controlled to provide their effective management. It is not possible to provide quality implementation of a socio-economic strategy without the control. Moreover, the control is inherent in any repeating (institutionalized) economic transaction both on the market, and within the company (Vasilev & Akhmetshin, 2014).

If to address to the research scheme of N. Fligstein (Fligstein, 1996), it is possible to draw the following chain of institutional mechanisms to ensure economic security (Figure 1).

Figure 1 THE CHAIN OF AN INSTITUTIONAL MECHANISM TO PROVIDE ECONOMIC SECURITY



A. N. Nesterenko notes: "Institutions occur initially on the basis of the human instincts and simplest needs; contributing to their satisfaction, they become self-sustaining and form the stereotypes of thinking according to the principle of feedback" (Nesterenko, 1997). The scheme shows that being the embedded stereotypes of thinking institutions set the structure of operative motives of human interaction, and hence affects the functioning of the economic system making a clear sequence and subordination of actions and processes in it. Institutions are a combination of formal and informal rules that enable economic entities to organize and carry out their activities in the socio-economic environment (Vasilev, 2014).

If mechanisms for evaluation of the staff and departments on the results of control are available, the control system helps to develop an understanding of business processes and strategies of their own actions. An effective control mechanism is the guarantor of that individuals will execute the rules mandated to them and the adequacy of these rules to the expected results will be found (Vasilev, 2014). If upon the qualitative execution of the rules we do not get the expected result, such rules will certainly be revised. This is required by the principle of the organization of control activities: principle of evaluation based on the results (Mullakhmetov, 2015).

It is also fundamentally important to shift emphasizes from working for the elimination of deviations and their impacts on the detection and elimination of the causes of deviations as a prerequisite for avoiding reactive forms of management (Mullakhmetov et al., 2014). The costs of infringement of the rules must be greater than the benefits in their infringement. The stability

of the control mechanism operation allows the institutions to make as universally recognized and accepted by all to perform (Vasilev, 2006). Douglass North wrote that "institutions create the basic structures by which people have achieved an order and thus have reduced their uncertainty throughout history" (North, 1989).

Thus, we can say that the institutions affect economic agents' motives structure and jointly implemented by the establishment of control mechanisms.

RESULTS

Practical Approaches to the Use of the Control Function as a Factor of Strengthening of an Economic Safety Institution

A control function is necessary for efficient management of socio-economic systems in the conditions of limited resources and the possibility of opportunistic actions of the staff. The control is an integral part and one of the main functions of management that consists in the constant and systematic monitoring of objects and processes for compliance of their behavior and status (results) with the organization's management system policy and the current legislation. According to K. S. Mullakhmetov, today the role of control as the basic management function is still undervalued despite the presence of traditional control systems based on the evolution of the practice and theory of control and controlling systems as a result of the application of the system approach methodology to the organization of control activities. Globalization phenomena taking places in modern macroeconomics, creation of integrated organizations and corporate unions will inevitably cause the processes of decentralization of management and the need to improve the monitoring of decentralization (Mullakhmetov, 2013).

Control as a subsystem of an organization's management system involves all its system characteristics: thus, the state of the control subsystem is largely determined by the characteristics of the management system.

The general evolution trend of the management and control theory and practice indicates that the management processes become more "democratic": the amount of management actions and control procedures is reduced, and their content becomes more "soft". Control philosophy changes from centralized and rigidly formalized procedures to the decentralized control based on the results, the role of the creative control as the spread of good practice and learning effect grows. These changes allow the use in an administrative activity of social, psychological, moral and ethical instruments, culture of the organization, thereby increasing the efficiency of administrative activity and create a more comfortable environment for staff (Mullakhmetov et al., 2014).

K. S. Mullakhmetov allocates managerial and behavioral aspects of control where the behavioral aspects are:

- 1. Freedom restriction, an obstacle to the achievement of personal goals opposition to control;
- 2. The desire to preserve a well-established and satisfactory fitness of things the desire to maintain control over the situation;
- 3. Power, i.e., a system (procedures and actions) which allows the people and processes to keep within certain framework of "rules of the game", ensuring the required behavior (i.e. discipline) (Mullakhmetov, 2013).





As can be seen, the opposition to the control is a consequence of the very essence of people as psycho-physiological substances.

Laurie J. Mullins believes that the primary reaction of the people to control their activity is opposition, because they appraise control as an obstacle to the achievement of their personal goals (Mullins, 2003).

Some people oppose control because they understand that the control will reveal whether they do a good job. This creates opposition to control among the weakest performers. Even the good performers sometimes oppose to control because they are afraid of losing flexibility or freedom which, in their opinion, are necessary the elements of the high-level job (Porshnev, 2000).

The degree of personnel opposition to control depends on the nature of the control system, and the personal characteristics of the employees concerned. For example, Edward E. Lawler (Lawler, 1976) suggests that the opposition to a control system is most often seen in the following cases:

- 1. Control system restricts the expansion of the sphere of activity;
- 2. Control system replaces the established system into creation of which people have invested a lot of efforts;
- 3. Applied evaluation criteria were established without the participation of employees;
- 4. The results of the control were not disclosed to those employees the efficiency of which work has been estimated in this case;
- 5. Data of control system are transferred to the higher levels of a management and define the reward scheme;
- 6. Employees whose work falls within the scope of control are relatively satisfied with the status quo and consider themselves fully committed to the objectives of the organization;
- 7. Employees who are subject to control have no sufficient pride and self-confidence (Mullins, 2003).

Results of control have effect on positioning of personnel activity, with respect to the goals and objectives of the organization and its subsidiaries:

- 1. Positive assessment: gives confidence in correctness of the actions,
- 2. Negative assessment points to the shortcomings and omissions, and on the available reserves to improve operating efficiency thereby creating a training effect.

DISCUSSION

Most people prefer effective performance and accept control what provides a consistent feedback allowing adequate assessment of the work done, but they oppose to control which is, in their opinion, inaccurate, despotic, or poorly organized, pursuing personal or group interests, and not the organization's goals (Akhmetov et al., 2014).

Effectively established control must be strategically oriented, focused on results, be timely, fairly simple, and understandable to all participants of the control process. The last requirement is particularly important in modern conditions where organizations seek to arrange their work on the principle of trust in people, and this leads to the necessity and possibility of a substantial reduction in the control functions performed directly by the managers. Under these conditions, control becomes less rigid and more economical; the conditions for self-control are created (Vasilev & Akhmetshin, 2014).

Economic security is understood by us as a system of interrelated institutions or rules of conduct the effective implementation of which is not possible without the control system adequate to existing management system. An important place in the research methodology on the system of economic security institutions is taken by indicators for which it is necessary to design a control function. In this case the economic security indicators should create a system that allows quickly influencing socio-economic policy in the country. This in turn requires embedding control measures in the strategic and tactical plans for the economic development of the country. Thus, system of economic security institution management must have an adequate control system for efficient achieving its objectives.

CONCLUSION

The control plays the important role in our daily life and professional work. In the capacity of a source of information, it largely determines the decisions taken, and in the capacity of a power factor it helps to regulate human activity and social processes in general. Development of social and economic development strategy of Russia, overcoming internal and external threats, establishment of high economic security indicators are not possible without the formation of appropriate control mechanisms.

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STATE CONTROL OVER SMALL BUSINESS DEVELOPMENT: APPROACHES TO THE ORGANIZATION AND PROBLEMS (EXPERIENCE OF THE REPUBLIC OF TATARSTAN, THE RUSSIAN FEDERATION)

Ekaterina Vladislavovna Krotkova, Kazan Federal University Khanif Sharifzyanovich Mullakhmetov, Kazan Federal University Elvir Munirovich Akhmetshin, Kazan Federal University

ABSTRACT

The paper presents some of the approaches to the organization of state control over mechanisms of implementation of programs to support small business in the Republic of Tatarstan (RT) of the Russian Federation (RF) and highlights the main problems arisen thereat. It is emphasized that the implementation of state programs to support small and medium enterprises is a strategic factor of sustainable innovation development of economy of the region. A prerequisite for success is an effective control system of the main processes of the state programs that allows adequately assessing their progress.

The carried out comparative analysis of the enterprises – residents and non-residents of the business incubator in the city of Naberezhnye Chelny, RT, through the issue of asymmetry of their performance indicators has allowed revealing the main shortcomings of mechanisms for the implementation of government programs to support small businesses, quality control instruments for implementing the program activities and the efficiency of use of budgetary funds, and offer reasonable proposals to improve the system of state control in this area.

The paper represents not only the shortcomings of the state control over the implementation of programs to support small and medium-sized businesses, but specific measures based on the results of the study has also proposed that can be considered as the first step in creating an effective system of control.

The authors believe that the implementation of programs to support small and medium enterprises have substantial reserves to increase its efficiency. A control system which meets the requirements of good practice to the effectiveness of control, covers all main processes of support programs, is a prerequisite for their successful implementation. In the Republic of Tatarstan the priorities of socio-economic development of the region and mechanisms for support of small and medium-sized enterprises are not consistent. Existing monitoring tools do not provide achievement of objectives of government support programs. The authors consider it necessary to develop a methodology for evaluating the operating efficiency of small and medium-sized enterprises of proposed by them asymmetry factors for the various groups.

Key Words: State Control, Small Business, Government Support, Monitoring Efficiency, Performance Evaluation Method, The Asymmetry of Development of Small Business, Business Incubator

INTRODUCTION

Development of small and medium-sized businesses in the region is a strategic determinant of sustainable economic development. Currently the Republic of Tatarstan accounts for 142,780 economically active small and medium-sized enterprises. The share of small and medium-sized businesses in the gross regional product (GRP) of the Republic of Tatarstan is about 25%.

One of directions of regional policy in the Republic of Tatarstan is to support small and medium-sized businesses. In countries leading in terms of innovation, small businesses supplying the market more than half of all new ideas. In economically developed countries, the rate of implementation of innovations in small businesses on average is one-third higher than in large ones (Duplenko, N. G., 2014, p.97). Therefore, at the present stage, an important task is to create prerequisites for the development of small innovative business.

However, it is necessary to take into account the asymmetry of regional small business, i.e. territorial disproportion in the number and activity of small innovative enterprises. The practical significance of the diagnosis of the regional asymmetry in innovative development of small business is related to the fact that it can be used to improve the efficiency of incentive programs to support small (innovative) entrepreneurship.

The problem of objective evaluation of the asymmetry in regional development was discussed in the works of C. Economidou and C. Kool who studied the asymmetry of economic development in the EU (Economidou and Kool, 2009, p.778), K. Behrens who studied the effect of the inter-regional markets on the asymmetry in economic development of the regions (Behrens, 2005, p.471), Y. Kim who has made a contribution to the study of asymmetric regional development in the North-East Asia (Kim, 2005, p.673). However, none of the researchers have consider asymmetry in development of small business, its relations with individual economic entities and sectors of their functioning on the sub-regional level.

Among domestic researchers, we may note, for example, M. Y. Belikov, M. V. Boyko, and S. S. Zheleznyakov who have studied issues of regional asymmetry regulation; D. N. Vorobiev who has studied the question of smoothing asymmetry at the subregional level; and M. V. Galdin who has developed the methodology for the evaluation of regional asymmetry.

To date, in the Republic of Tatarstan there have been created practically all types of infrastructure and economic and scientific activity: the special economic zone, the technopolis, industrial parks, technology parks, and business incubators. Residents of these innovation infrastructure subjects are predominantly small and medium-sized enterprises (Krotkova, 2014, p.79).

METHODS

A system of measures on state support of small business is actively formed in the Republic of Tatarstan at the expense of the republican and federal budgets, and extra-budgetary resources. The interest of the state in business activities is implemented through the tax, budgetary, and other kinds of the state policy (Mullakhmetov, 2009, p.31). Tools of federal and regional government control are used to assess the implementation of small business support measures.

Diagnosis of asymmetry indicator of small business development was carried out in five stages.

The first step is to collect the information needed for the study. (Statistical monitoring data)

During the second stage asymmetry of small business development was evaluated. Under asymmetry we understood the uneven development of the enterprises within the same municipal formation.

We have used such an indicator as labour productivity to evaluate the asymmetry.

Then two indicators of asymmetry have been calculated:

- Range of variability which shows the limits within which the indicator varies (defined as the difference between the highest and lowest values of the characteristic):

$$R = X_{\max} - X_{\min} \quad (1.1.)$$

- The asymmetry factor which allows determining of the asymmetry value, as well as answering the question about the presence or absence of asymmetry in the distribution of the characteristic in the general population:

$$As = \frac{\mu_3}{\sigma^3}, (1.2.)$$

where μ_3 – is the moment about mean of the third order:

$$\mu_3 = \frac{\sum (x_i - \bar{x})^3}{n}$$
(1.3.)

 σ – is a standard deviation.

At the third stage, a comparison of asymmetry factors was carried out: firstly, using the values of the respective companies (residents and non-residents of the business incubator in each branch). The results of the comparison made it possible to give a relative estimate of the level of asymmetry. Secondly, the factor of asymmetry was compared with its value in the previous period in order to analyze the dynamics of asymmetry. Forecast of development of the situation in each branch under consideration has made it possible to construct a range of factor values for several years.

In the fourth stage, signs of excessive asymmetry, as well as the deterioration of the situation were revealed based on the comparison conducted.

The aim of the fifth stage was a recognition and identification of problems which magnify the asymmetry of development of small business in the city.

To determine the operational effect of small businesses entities, let's consider the problem of asymmetry in the results of their activities through a comparative analysis of companies which are residents of the business incubator in the city of Naberezhnye Chelny and companies operating in similar sectors of the regional economy without the support of business incubators; let's consider the impact on operating efficiency of companies from the government support programs as well as the quality of the organization of monitoring the state support measures.

RESULTS

The considered method of small business development asymmetry assessment has been approved by the example of a business incubator in the city of Naberezhnye Chelny for the years 2010-2013. It was found that not only the average productivity of labor in general for each industry varies, but its individual value for each company included in the set considered varies, too (Table 1).

Table 1 THE RANGE OF VARIABILITY FOR CHANGES IN LABOR PRODUCTIVITY OF RESIDENTS AND NON-RESIDENTS OF THE BUSINESS INCUBATOR IN THE CITY OF NABEREZHNYE CHELNY, THS. RUBLES

Sector of Economy	2010	2011	2012	2013
Manufacture of transport facilities and equipment				
Residents	1296,75	1390,25	634,01	447,04
Non-residents	120,10	515,40	244,30	169,40
Metallurgical production and production of				
fabricated metal products				
Residents	424,71	160,00	973,89	677,03
Non-residents	308,85	756,63	932,35	676,89

The calculations conducted show that the range of variability of labour productivity for residents of the business incubator in the sector of economy "Metallurgical production and production of fabricated metal products" is more stable, but non-residents have a larger reserve of labor productivity growth, as in the event if all non-residents of the business incubator will achieve maximum labour productivity, the average value of the output will be significantly higher than that of residents.

A similar situation is also observed for the enterprises operating in the sector "Manufacture of transport facilities and equipment". Non-residents, in turn, have a small range of variability; hence their rate of labour productivity growth has slowed.

However, the range of variability does not consider variation of options within the studied population. The calculation of the asymmetry factor (Table 2).

Table 2ASYMMETRY OF LABOUR PRODUCTIVITY OF RESIDENTS AND NON-RESIDENTS FROM THE
BUSINESS INCUBATOR IN THE CITY OF NABEREZHNYE CHELNY

	Manufacture of transport facilities and equipment				Metallurgical production and production of fabricated metal products				
Asymmetry factor	2013	2012	2011	2010	2013	2012	2011	2010	
Residents	-0,129	0,323	0,006	0,272	0,286	0,388	-0,063	-0,707	
Non-residents	0,462	0,377	-0,445	-0,492	-0,17	0,15	0,83	0,37	

As can be seen, the factors of asymmetry are mostly positive, consequently, the enterprises have the predominant values of labor productivity that are higher than the average. At the same time, one can observe a tendency this figure increases for non-residents of the business incubator that operate in the industry "Manufacture of transport facilities and equipment". If the figure for these companies was negative until 2011, i.e., had a left-handed (negative) asymmetry, then in 2011 it has grown considerably, therefore, the companies are interested in increasing the productivity of its staff in comparison with residents.

Regarding the residents of the business incubator working in both sectors, the indicators of asymmetry are reduced every year. The asymmetry factor for non-resident enterprises in the sector "Metallurgical production and production of fabricated metal products" in 2013 was

negative indicating a decrease in productivity and the prevalence of values which are below the average. However, it should be noted that residents receive certain preferences, and at the expiration of the three year period staying in business incubator they start to work on their own and to carry out their activities without support. According to statistics, more than 50% of enterprises do not cope with the competition in their sector and are forced to close down.

State support of entrepreneurship (in 2014 funding for the business incubator in the city of Naberezhnye Chelny was 4.13 million rubles, in 2015 - 4.27 million rubles) does not guarantee the realization of the tasks in view:

- 1. An increase in the number of jobs;
- 2. A certain level of tax revenues;
- 3. Increasing the innovative activity of the enterprises and, accordingly, growing the share of innovative enterprises;
- 4. Increase the share of product innovation;
- 5. Improving the competitiveness of the economy of the city and the region.

CONCLUSIONS

Let's note, that in the legal documents issued by the Government of the Republic of Tatarstan, regarding business development, there were defined indicators (for example, "the number of small businesses per 10 thousand persons of the population", "percentage from the average number of workers of small enterprises in the average number of employees of enterprises and organizations", etc.) which characterize only the quantitative side of the question, but do not reflect the results of operations of small businesses. Thus, the established figures do not reflect the essence of the monitored process, and cannot ensure the effective achievement of the goals (Mullakhmetov, 2013). The lack of a structured and properly formalized "desired state" of the control object through a system of indicators makes it impossible to implement the main procedure and, correspondingly, monitoring of the object (Mullakhmetov, 2015, p. 128), (Mullakhmetov, 2005, p.3). It necessary to finalize the methodology for assessing and analyzing the effectiveness of small businesses for the purpose of effective management of the process.

In addition, accounting of the actual data on the number of newly created jobs, additional tax revenues to budgets of all levels as a result of state support measures is not carried out, so that it is impossible to determine the effectiveness of the use of budget funds.

As can be seen from this study, the implementation of programs to support small and medium-sized businesses has significant reserves of increase of its efficiency. System monitoring of all main processes of the programs adopted in this area, is a prerequisite for their successful implementation (Mullakhmetov et. al., 2014, p.237).

We believe that the state and municipal authorities should follow up the actually functioning enterprises also after their leaving the incubation period and determine the effectiveness of their activities and evaluate the impact of government support. In our opinion this is the main drawback of the mechanism of state control over the activity of business incubators. To eliminate it, the asymmetry factor calculation method can be applied allowing determination of the efficiency of enterprises and ensuring effective investment of budgetary funds.

Based on this study we can propose the following priority actions for the creation of effective system for control over implementation of programs to support small and medium-sized businesses:

- 1. Include in the systems for performance evaluation and promotion of activities of local government the performance indicators on small business development (job creation by small businesses, the turnover of small enterprises);
- 2. Define a clear procedure for monitoring the efficiency of the business support infrastructure; develop and bring to the innovation infrastructure subjects the methodology for calculating the performance indicators of their activities;
- 3. Tighten control over the use of budgetary funds provided to small businesses in the form of grants, over timeliness of reporting; to develop a clear procedure for monitoring the implementation of business projects.
- 4. Carry out evaluation of the economic efficiency of business projects which pretend to state support, on the basis of the developed procedure.

Small business support programs in the Republic of Tatarstan need a transparent structured control system adopted conceptually both by government agencies and by business entities. The control mechanisms and methods in use today do not provide solving of the basic problem: the effective use of budgetary funds allocated for the development of small enterprises.

The way out of the situation would be scientifically grounded, holistic methodology for evaluating the performance of small and medium enterprises on the basis of calculations of the asymmetry factors for the various groups that is proposed by the authors.

The authors believe that in current regulations of the Republic of Tatarstan there is stated a system for an innovative economic management through the mechanisms and tools of business incubators, technology parks, government support programs, the amount and structure of which at this stage are sufficient, but there is an urgent need of improving the quality of their implementation and application of technology.

Analysis of the monitoring state for implementation in of programs aimed to support, promote and develop small and medium-sized businesses has shown a number of deficiencies that have been reflected in our previous studies (Mullakhmetov et. al., 2015, p.1732) including that a control system is inadequate to management system, and as a result, that the socioeconomic development objectives (priorities) of the Republic of Tatarstan and the tasks of the state support of small business activity are inconsistent. Structured control system adequate to the existing management system that takes into account the purpose and objectives of small business development should be a base of sustainable innovation development of the Republic of Tatarstan.

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INFORMATION MANAGEMENT IN THE FIELD OF JOURNALISM: INFORMATION SELECTION PROCEDURE AND EVALUATION METHODS

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ABSTRACT

Economic trends determined by formation of information society in Russia and in the world, point to a large contribution of information and knowledge in an innovative progress of society. The key concept is "information" as data regardless of a form of their presentation. However, in the moment when the data are recorded on a physical medium, paper or in electronic form, they become documented information (documents). Only documents can be transmitted in the information and telecommunications networks, collected and used. However, the task on the analysis of these documents and making the decisions on their basis is solved only by a human. In journalism success depends on effective information and knowledge management what is a hot topic today.

The authors note that the information and knowledge management technologies in a company include the technologies of search and selection of information in accordance with the needs of the company.

It is indicated that a Russian consumer of information has a distorted view about the role of periodicals in business. Evaluation of reliability of the information in computer science is one of the most difficult problems. The authors emphasize the need to assess the reliability of a primary source.

Key Words: Information, Global Information Market, Information Management, Information Assessment Technologies, Information System

INTRODUCTION

The process of information management includes certain needs of the company in the data. Schemes of information support defined by information requirements may be either centralized or decentralized. Typically, such information is necessary for companies to make many administrative decisions; in this case, it is advisable to familiarize with new knowledge about the state of the art in the required fields. Information tends to become obsolete. For this reason, in the present conditions there is a need to constantly replenish the knowledge, and it is necessary to be able to quickly navigate within the rapid flow of scientific information.

Information resources management is performed in several stages: to set goals, to formulate information needs, to determine information resources, to select the desired data, then to organize access to information, and also its application. The stages end with the analysis of

costs incurred and their effectiveness.

Definitely, the current global information market is fully shaped. There are more than eight thousand news agencies in the world (Seletkov S.N., 2006, p. 410). Major news agencies are reliable sources of relevant and necessary information. This information does not require additional verification. For this reason, working with news agencies is beneficial to enterprises and to the media, because this makes it possible to obtain new information filling the existing database. "Agency first, and at the same time quite sensitively react to any changes in the media environment, whether fluctuations in the political climate, technological innovations, market conditions, or preferences of consumers of information. Agency actually creates and keeps professional standards in the handling of information; they are also the first to make changes to the standards when objective necessity in this becomes imminent" (Vartanova E.L., Viren G.V., Frolova T.I., 2013, p. 7).

An electronic component of the world information resources occur, it is professional databases and information resources of the Internet. Database content reflects the needs of users. Scientists say that if earlier the users requested mainly scientific and technical information, at the present time questions concerning business, trade and industry are key in queries. The same interest is the area of patent and legal information (Khoroshilov A.V., Seletkov S.N., 2004, p. 7).

The information is presented in libraries, professional databases, Internet business resources, and in digital libraries. The volume of information in professional databases is more than 10 billion records. In Russia, 150 thousand libraries contain more than a billion exemplars of publications and the number of e-libraries is only about 400. Currently, in the world there are published more than 200 thousand periodicals, of which two-thirds have no restrictions on their scope. Just over 10% of periodicals are represented in the Internet. 12% of 16 thousand journals and magazines in the field of business and economics are represented in the Internet in full. (Seletkov S.N., 2006, p. 410).

Free Internet resources fully operate in the market of information resources; as a result, web sites with free and professional databases complement each other.

As modern researchers recognize, state of information resources and information and communication infrastructure on the local, national, and regional levels show a decisive influence on the formation of a global information space. At the same time, it should be noted that the formation process comprise a threat to information space security and problems of unequal access to both the information and communication resources (Kozoriz N.L., 2013, p. 104). To prevent security threats, an inventory of assets is conducted in the course of which information streams are optimized.

Also, one of the unsolved problems in the field of information is considered to be the problem of assessing the reliability of the information despite the fact that there are approaches to the solution of these problems, but they are only general guidelines.

METHODS

The scientific and methodological basis of the study was legislative and other normative acts, the works of domestic and foreign scientists on information management, as well as works on management and economics.

The empirical base of the study was the legislative and normative acts of the Russian

Federation, official statistics, the sites of news agencies and databases.

Works of various authors were devoted to study of information management problems. However, the problems of formation of the information society are often reduced solely to information management problems. Common problems are the implementation and use of computer and telecommunication equipment which may not automatically lead to the innovative development of a company.

We believe that success in creating innovative projects depends on effective creative work of employees of the company with information sources. Therefore, a special attention also should be given to the information management technologies.

In the course of the studies and within their framework we have used different methods of research: logical analysis, systematic approach, expert evaluation method, retrospective analysis, and others.

RESULTS

We have interested in the question in what the management objectives are expressed.

First of all, they are expressed in increasing the effectiveness of the company activities, and this may be through the provision of appropriate and reliable information.

Information management tasks may be expressed in terms of the need to provide information for making management decisions, and also in the education and training of personnel, and as to companies producing media products they additionally appear upon creation of new media products and services.

Two levels of management should be differentiated: strategic and operational. Designing of the company activity is performed as part of the strategic management level (Romanova, A.I., Zagidullina, G.M., Afanasyeva, A.N. & Hkairetdinov, R.S., 2015, p.549), its results are specified in the form of a business project. Let's outline the information necessary to develop a business project: company specialists from the entire full database select the information which requires certain actions from the company management. In the case of strategic planning for a longer period there should be organized regular monitoring and tracking the changes in the company. In the case of significant changes, the strategy of the enterprise and business project is usually changed, and, respectively, transfer to the operational level of management should be achieved. As a result, decision-making will involve the total needs of these two information streams.

Owner of the company plays a major role in the information processing, for example, in personnel and organizational issues, for instance, the authors write about examples where information processing services are spun off into a separate company. The owner is often involved in the operational management issues, as a rule, only in companies where management is the owner of the company. Despite the fact that in the world practice the management is hired, in Russia it is quite common that the company's owner is its head (Lukyanov O.V., Smirnov E.S., Hrapov I.V., 2011, p. 321).

Companies which develop new media products have a little different, specific information needs. In the market and competitive conditions they have to work continuously to improve the produced goods, and therefore, it is advisable to mediagroups to perform constant monitoring of all the information which relates to the production of such media products.

In the course of selection, organization of personnel development and training in the company, needs should be agreed not only with the management, and also with specialists of the

given department of the company. (Shuvaev A.V, 2015, p. 149)

Separately, it should be noted that the list of mandatory sources should include both domestic and foreign sources.

Let's discuss issues of selection of information sources.

The main part of the information resources is often purchased by information users on a subscription basis, i.e. preparatory work is performed on selection of periodicals and databases. This selection is based on the criteria of importance of publications.

The number of magazines increases every year: if in 1800 there were about 100 scientific journals, 150 years later their number has increased in 1000 times. Currently, about 100 thousand of magazines are published in the world (Literature search and bibliography, date of the application 150.05.2016).

In special circumstances, when there was a planned economy, for 70 years a Soviet consumer has become to an appropriate understanding of the role of the media in the business; it was thought that such publications mainly intended for scientists and specialists of narrow sectors. Due to the conditions of market relations in Russia these publications were forced to change their content and, respectively, the scope.

Modern periodicals publish materials about the companies and their products and services, and new technologies. Media review the market conditions. Advertising is also a staple of a large number of periodicals. Release and regular distribution give the media the opportunity to provide the target audience with fresh information, thereby satisfying their needs. Also it should be noted that over the past decade the Russian periodicals approach by their quality to the journals commonly used by entrepreneurs of leading countries in various sectors. In addition to the Russian version of "Forbes" and "Harvard Business Review" magazines, such periodicals as "Business Magazine", "RBC", "Business and Society", weekly journals "Money", "Expert", and others successfully work in Russia.

Some authors consider such periodicals "media for impact" which main task is to ensure the impact on public opinion and behavior patterns of the population (Jozef Dzyaloshinsky, 2014, p. 89).

The following method of selection of periodicals may be of interest for businesses: evaluation is based on a grading system grounded on data on the application of those periodicals by information centers to provide them to consumers (Kirilova O.V., 2004, p. 61). Ulrich's Periodicals Directory guide can be used to obtain such an estimate. The guide is published under Bowker brand since 1932. According to the Internet, it contains information on more than 300 thousand periodicals. The guide includes such information for each periodical as basic information about the periodical, about its distributors, and also its inclusion in the process for the preparation of specific information products and in funds of the largest document delivery services.

When classifying a magazine there should be taken into account the number of publications which in some way participate in processing of the magazine, and of course, delivery services in which funds the magazine is listed. Such information can characterize the degree of recognition of the periodical in the world.

Besides, it should be remembered about other important indicators such as a scientific rigour of the periodical, availability, except the printed form, of a website or other forms of publication, the ability to review the accepted papers before they would be published.

"Impact factor" is now used as an indicator of the value of the magazine. It is calculated based on the data about citing the journal. Despite the fact that the "impact factor" can be used as a verifying technique, its high value is not always a guarantee of the quality of the journal.

We turn your attention to approach for clarification and definition of agencies with which the agreements are made for access to their professional bases (Feldman, S., 2004, March, p. 2). The guide "Gale Directory of Databases" is the most important in this area.

At first, the selection of the bases should be carried out under the subject index. Next, it is necessary to consider the description of bases and ultimately to select the relevant requirements of the company. According to them, generators should be clarified that provide bases, then following by the descriptions of generators suppliers offering information of these bases is defined. If there are several options, naturally, the supplier with the lowest cost information will be chosen.

Timeliness, reliability and cost are the three main indicators used in the evaluation of information (7th Synthesis Report of the Sectoral e-Business Watch, 2010, p.178). If timeliness is broken, then guilty is either the agency-generator which has reflected the information in the system with a delay, or the supplier which has allowed the delay in the transmission of information to the user.

Allowable delay time should be noted in advance in the contract drawn up between a supplier and a generator.

It is necessary to consider that some delay may be due to the work of the search engines.

Another complex problem is the reliability or falsity of the information: how much information about the object in the information system corresponds to real life.

The process of evaluation of truth for the information provided is difficult, because it is an analytical process that depends on several factors. When estimating, the basis should be knowledge possessed by the person conducting the estimation (Kolosova O.Y., 2016, p. 72).

At the same time it is necessary that he/she should know how and through which channels, and from what source, information was received. This will allow an estimation of the reliability of the source to perform. Also, we must remember that after the primary source during transmission of information in chain order, other sources can make their updates, corrections, and also distortions in the information.

The following techniques can be used to assess the reliability of information: a comparison with the information provided by other sources, such as news agency LexisNexis being the owner of the unique information about the various companies in the world. After its creation in 1973 in New York, the agency serves companies in 100 countries.

The criterion for reliability may be both a rating and ranks of sources; upon that, preference will be given to those who have the highest rating.

In extreme cases, companies may apply to the independent auditors monitoring the reliability of information.

Finally, if it is possible to verify data by experiment, the reliability of such information will certainly rise.

CONCLUSIONS

So, information management is a direction that regulates the activity on dealing with information. It includes information technologies, information security, for sure, as well as

advertising and marketing, and finally, the use of the information by its users.

To date, the material and technical basis is mandatory component of information process control.

RESUME

As mentioned above, the purpose of information management is improving the efficiency of a company. It is proved that this happens only in the case if the company receives true and reliable information. For example, a company engaged in the creation of new media products, needs to constantly monitor the information which relates to the production of such media products.

Information management consists of two levels: strategic and operational, and a major role in the information processing belongs to the owner of the company.

Currently, there is a problem of reliability of the information received that may be resolved by different methods.

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TOURISM AND SUSTAINABLE DEVELOPMENT

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ABSTRACT

This paper presents the problem of interdependence and interconditionality of the concepts "sustainable tourism" and "sustainable development of tourism". The relevance of the topic chosen is associated with the problem of sustainability of tourism development in the conditions of global instability as the modern tourism is a rapidly developing social and cultural phenomenon which dynamics is based on a system of human interaction with the world. Being in the center of the research field, tourism is related to the modern global processes and is hardly exposed to their influence that is reflected in the change of its qualitative and quantitative characteristics. The tourism being one of the steadily developing branches of the world economy is the industry almost in all countries that has valuable potential opportunities in terms of creating a different kind of economic interests, and attracts more and more attention. The potential opportunities of tourism include: improving balance of payments, access to new investment resources, the increase in state revenues, creation of new jobs, development of public utilities, and others. The paper provides an overview of the literature on the issue of sustainable development of tourism. We give the principles and indicators for sustainable tourism development. The carried out analysis allowed us to determine some of the basic principles of sustainable tourism development taking into account the conceptual arguments in favor of development, sustainable development, and sustainable tourism development.

Key Words: Tourism, Sustainable Tourism Development, Sustainable Tourism, Indicators and Principles of Sustainable Tourism, The Program "World Sustainable Tourism Criteria", World Tourism Organization

INTRODUCTION

Sustainable development in its now classical sense is possible (Shimova O.S., 2014, p.158) under condition of achievement of the economic, social and ecological purposes, compliance of social and economic systems of different levels with three key criteria: economic efficiency (cost recovery by revenues); environmental sustainability (ensuring long-term viability of ecosystems); social well-being (equal satisfaction of cultural, material, and spiritual needs of society). Example of tourism is indicative in this context.

The problem of sustainability of tourism development in the conditions of global instability is highly relevant since modern tourism is a rapidly developing social and cultural phenomenon which dynamics is based on a system of human interaction with the world (Lysikova O.V., 2009, pp. 38 - 111). The tourism being one of the steadily developing branches of the world economy is almost the industry in all countries which has valuable potential opportunities in terms of creating a different kind of economic interests and attracts more and

more attention. The potential opportunities of tourism include: improving balance of payments, access to new investment resources, increase in state revenues, creation of new jobs, development of public utilities, and others.

MATERIALS AND METHODS

Since the late 1980s, the theory and practice of sustainable development are in the focus of researchers. The term «sustainable development» is widely used in scientific discussion. In 1992, according to the results of the UN conference in Rio de Janeiro there was approved the policy document, "Agenda for the XXI Century" ("Agenda 21"), there was adopted the Declaration on Environment and Development, there has been prepared a package of documents on sustainable development, definitions having over seventy interpretations, and in 1995 jointly by the World tourism organization, the World Council of Travel and Tourism, and the Earth Council have developed the document "Agenda 21 for the Travel and Tourism Industry " (Novikov V.S., 2007, 208 p).

This paper analyzes the strategic and economic importance of tourism, gives the numerous reports of excessive influx of tourists, the loss by some territories of their former glory, destruction of local culture, transport problems, and the growing resistance of the local population to influx of tourists. The principles of sustainability refer to environmental protection, economic and socio-cultural aspects of tourism development, and an appropriate balance should be set between these three aspects in order to ensure long-term sustainability of tourism (Novikov V.S., 2007, 208 p).

In 2000, the well-known tour operators in cooperation with UNEP (United Nations Environment Programme), the United Nations Commission for Education, Science and Culture Organization (UNESCO), and the World Tourism Organization have created a voluntary non-profit partnership "Tour Operators' Initiative for Sustainable Tourism Development" (TOI) (Quebec, 2002). Members of the partnership define sustainable development as a basis of their business activities and work together to promote practices and methods that are compatible with sustainable development. In 2002 UNWTO in cooperation with UNCTAD have developed the program "Sustainable Tourism as the key to the eradication of poverty" (STEP).

Now a variety of international programs on sustainable tourism are implemented. One of them is the Integrated Coastal Zone Management which has the status of the Code and adopted by most European countries; it is intensively developing in America, and is relevant for Russia. However, it should be noted that to date the general definition of "sustainable tourism" does not exist.

RESULTS

The sustainable tourism should be considered as the paradigm of adaptation which is one of the central concepts of development and sustainable development. In other words, a sustainable tourism development "should be understood as all types of tourism development that make a significant contribution to the observance of the principles of development, or at least do not contradict it for an indefinite time stimulating the ability of future generations to meet their own needs and desires" (London: MacMillanEducation Ltd. – 1989).

The definition of sustainable tourism given by the World Tourism Organization (WTO) (Whitton T., 2002, p.62; http://internetfiji.com/tes/warwick,html, accessed March26, 2003; Journal of travel research, 1993, p.3; world Tourism Organization, 1993) focuses on three main

points that must include sustainable tourism: optimizing the use of resources in order to preserve the environment, respect for local communities and division of profits from tourism among all stakeholders. In addition, the definition emphasizes the necessity to meet the needs of tourists within the interaction of non-governmental organizations and businesses. (Byrd E. T., Cárdenas D. A., Greenwood J. B., 2008, p. 192)

One of the initiatives aimed at making the definition of sustainable tourism more practical was a program of Global Sustainable Tourism Criteria launched in late 2008 by Association for the development of criteria for the global sustainable tourism. The Association's mission is to build a "set of basic criteria arranged around the four linchpins of sustainable tourism: effective sustainability planning; maximizing social and economic benefits for the local community; reducing negative impacts on cultural heritage and reducing negative impacts on the ecological heritage" (Goulet D., 1971). The purpose of this program is to serve as a guide for the practice of sustainable development in tourism. (Hart M., 2000)

Nevertheless, the concept of sustainable tourism has been sharply criticized. For example, McKercher (McIntosh R. W., Goeldner C. R., Ritchie J. R., 1995, p.87) points to that the combination of sustainability with tourism does not seem flexible due to the nature of tourism as an activity. At the conceptual level Sharpley (Rubtsov, V.A.,Gabdrakhmanov N.K., Mustafin, M.R., Arzhantseva, N.V., Trofimov, A.M., p. 673) agrees with McKercher's opinion and concludes that sustainable tourism is far from reality. He argues that, although the principles relevant to this area remain important, and tourism can be a significant factor, it should develop further "without hiding for politically acceptable, albeit only in the tourism context, but inappropriate banner of sustainable development".

According to Hall C. (Gunn C. A., 1994, p.25), sustainable development, as well as the previously used term "protection", is obviously an attempt to reconsider the attitude to the opposite value positions in relation to the environment. Liu (Lansing P., De Vries P., 2007, p.77) identified several weaknesses in the studies on the sustainability of tourism, but given the likely growth of tourism, he called for a more action-oriented research to avoid the risk of idealizing a sustainable development.

It is interesting to note that some authors (Lai P.H., S.K. Nepal, 1995, p.28) call for the further development and use of existing standards in order to more clearly define what is meant by sustainable tourism, stressing that it is important to first clarify what is sustainability, and then try to measure it.

R. Sharpley raises the question of whether sustainable tourism refers to the qualities associated with sustainable development, or to the most stability of the industry.

Reflections and original author's ideas connected one way or another with the problem of sustainability of tourism development in the conditions of global instability is also found in the writings of contemporary sociologists.

W. Beck (Beck U., 2000, p. 7) introduces into the scientific discourse the concept of "risk society" the genesis of which goes back to the industrial society. The threat and danger have not protected areas, selectivity and differentiation in the modern world, its dynamics indicates a danger to everyone.

Z. Bauman (Bauman Z., 2008, p. 8) uses the word-semantic structure "fluid modernity" which he identifies with the mobility, impermanence, uncertainty, relativity, drawing a parallel with the tourism practice: "The lighter load in travel, the faster we move".

Peter L. Berger (Sapova V.V. ed. M. M. Lebedeva, 2004, p. 9) notes the wide variety of emerging global culture, "Davos culture" of the world's business and political elite, club culture

of literati, globalizing popular culture, the perception of a global culture with significant local variations and modifications. Sustainable tourism development has also been extensively studied by a number of other researchers, such as Bramwell and Lane (Bramwell B., 1993, p.1), Owen (Owen R. E., Witt S. F., Susan G., 1993, p.463) Murphy (Murphy P.E., 1981), Harris and Leyper (Hall C.M., 1994, p.27), Tosun (Todaro M. P., 1994), Maufort and Mantes (Miller G., 2001, p. 351), etc.

Despite all these differences, thanks to the launch of the project of the Association on development of the global sustainable tourism criteria, the real situation in tourism matches up to that the researchers propose (Dolnicar S., 2006, p. 235).

Thus, the definition given by Butler (Butler R. W., 1998, p. 25) for sustainable tourism development becomes an essential contribution to combining the sustainable tourism development concept with its initial terms. Butler argues (Butler R. W., 1980, p.5): "... we may consider sustainable development in the context of tourism as tourism which develops and persists to a certain area (community, environment) in a manner and to such an extent that it remains viable for an indefinite period of time, does not cause damage to the environment (human and natural), where it exists, and does not change the environment so that it ensures the successful development and prosperity of other activities and processes. This is not the same as sustainable tourism what can be thought of as the tourism having the form which can maintain its viability on a certain territory for an indefinite period of time".

It should be emphasized that Butler (Butler R. W., 1993, p. 26) distinguishes between sustainable tourism development and sustainable tourism. Although, it seems that this difference is not significant, however, it is a very important point.

CONCLUSIONS

Thus it is possible to specify some of the basic principles of sustainable tourism development taking into account the conceptual arguments in favor of development, sustainable development, and the sustainable development of tourism (SDT). These principles can be expressed as follows (Getz D., 1994, p. 15; Skinner E., Font X., Sanabria R., 2004, p. 121; Lanza, A. Markandya, F. Pigliaru., 2005, p. 225):

- 1. SDT should contribute to the satisfaction of basic and tangible needs of those who up to now had been deprived of them in local popular tourist centers.
- 2. SDT should reduce inequality and absolute poverty in the local popular tourist centers.
- 3. SDT should contribute to the development of the necessary conditions in the popular tourist centers that will enable local people to acquire self-esteem and feel free from the shackles of need, ignorance, and poverty.
- 4. SDT should accelerate economic growth not only on a national scale, but also at regional and local levels. This growth should be fairly distributed across the entire social spectrum.
- 5. SDT must achieve the above objectives and meet the principles for an indefinite period of time taking into account the ability of future generations to meet their own needs.

RESUME

The aforementioned principles of sustainable tourism development suggests that "the sphere of sustainable development of tourism is so wide that includes the role of tourism in sustainable development in the wider sense". In this case, sustainable tourism should be seen as a paradigm of adaptation that can cover a wide range of situations and formulate different

objectives. This implies that the sustainable tourism development as a paradigm of adaptation is multidisciplinary and covers a wide range of issues such as politics, economic development, environmental issues (Holcomb J. L., Upchurch R. S., Okumus F, 2007, p.461), social factors, the structure of the international tourism system, etc.

Nevertheless, in our opinion, there are several constraints to the movement towards sustainable tourism development. Priorities of the national economy, the lack of modern approaches to the development of tourism, arrangement of the administrative system, emergence of environmental issues and excessive commercialization, the structure of the international system of tourism are those factors which can be called "obstacles to the sustainable development of tourism" in the context of the developing world.

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FORMATION OF THE HUMAN CAPITAL ASSESSMENT QUALITY MODEL AT THE PRESENT STAGE OF DEVELOPMENT OF INNOVATIVE ECONOMY

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ABSTRACT

Human capital becomes more sensitive factor of production in the innovation economy when the situation related to its under-provision in quality or quantity can be critical for production. At the meso- and micro levels of the economy human capital is considered as a necessary production resource the quality and quantity of which depend on the effectiveness of management systems. In turn, the formation and development of human capital of the necessary quality and purpose strengthens the organization management mechanism and thereby allows more successfully solving the problems associated with increasing the competitiveness of production, the use of innovative technologies, increasing production efficiency and labour productivity.

The authors have developed a model for estimation of the level of human capital development at the micro level. This model is based on human needs in the capacity of a participant in the production process.

Such models can become the basis for revealing of "bottlenecks" in the development of human potential and improving its quality.

Key Words: Human Capital, Innovation Economy, Micro-Level, Economic Development, Human Resources

INTRODUCTION

A human capital shall be understood as the knowledge and skills embodied in a person that play an important role in determining the labour productivity and the ability to familiarize with new knowledge and develop new technologies and innovations (Schultz, T. W., 1961, p.5). The level of human capital growth has a positive effect on the rate of labour productivity growth (Hanushek E.A., Schooling, 2000, p.1184). Undoubtedly, there is an objective need to measure the quantity and quality of accumulated human capital in order to effectively manage the organization and to activate innovative development of the enterprise. Expert assessment of the quality characteristics is an important component in the human evaluation methods system, as it provides the most objective evaluation of the qualitative components of human capital among all the existing models.

RESEARCH METHODS

The research methodology is presented by graphical methods of analysis, synthesis, relation between historical and logical matters, normative and positive analysis, economic and mathematical modeling, as well as expert evaluation methods.

RESULTS

We have proposed a mechanism to evaluate the level of development of human capital at the micro level. This model is based on human needs as a participant in the production process.

As seen in Figure 1, the parameters for evaluation of human capital development level are classified with separation by two areas: economic and social development. The three-level monitoring system makes it possible to determine the level of accumulation of human capital, the possibility its use in economy, to evaluate the impact of human capital on economic growth. Human capital development evaluation mechanism allows its structural components to display.

Table 1 shows the indicators for human capital development evaluation concerning the block "Economic development" with specific statistics. The list of indicators is formed taking into account the availability of the information base developed within the framework of the Federal State Statistics Service, and has the ability of practical application.

An array of indicators includes the most informative parameters with a high degree of personal indicative ability precluding their cross-correlation. Evaluation of human capital development can be carried out at individual enterprises and innovative industrial complexes.

Figure 1 STRUCTURAL MODEL OF MONITORING THE DEVELOPMENT OF HUMAN CAPITAL IN THE INNOVATION ECONOMY



Analysis of the dynamics and the current state of human capital is realized through a set of direct indicators (quantitative representation of the labor force, the human capital cost) and indirect indicators which indirectly affect the quality of human resources (level of innovation activity and technological infrastructure of human capital operational environment). Analysis of
the cross-correlation of indicators excludes unwanted non-informative elements and allows only operating with statistically significant elements.

Table 1 THE SYSTEM OF INDICATORS FOR HUMAN CAPITAL DEVELOPMENT EVALUATION CONCERNING THE BLOCK "ECONOMIC DEVELOPMENT"

Direction of human capital development	Parameter for evaluation	
	Number of persons employed in the economy as a percentage of the economically active population	
the economy	Number of employees in organizations, thousand persons	
	Number of job vacancies (required workers) as a percentage of the number of employees	
	Average monthly salary of employees, rubles	
Cost of human capital	Growth rate of the average monthly salary of employees in the percentage to the previous year	
	Ratio of average salary of 10% employees with the highest and of 10% employees with the lowest wages, times	
	Share of innovation-active organizations, percent	
Level of innovation activity of	Investments in intangible assets of organizations, million rubles	
the human capital operating environment	Number of personal computers per 100 employees, units	
	Commercial exchange of technologies with foreign countries, units	
	Wear rate of fixed assets, percents	
Technical equipment of the	Fixed assets renewal factor, as a percentage of the available ones	
operational environment of the human capital	Fixed assets writing-off factor, as a percentage of the available ones	
	Fixed assets suitability factor, percents	

Block of indicators "Economic development" includes the parameters to evaluate the following aspects of the development of human capital.

1. Amount of human resources in the economy. This block of indicators describes the quantitative composition of the labor forces, their dynamics, as well as the need of the organization in the respective personnel. The number of economically active population accounts for migration flows, the phenomenon of labor push-pull migration. The degree of availability of human resources and entrepreneurial potential determines the nature of the economic performance, the rate, structure and scale of economic development. The accumulation of human capital is the basis for economic growth.

During the period from 2008 to 2015, the dynamics of the number of employees at enterprises and organizations of the Republic of Tatarstan had a diverse character. In periods of crisis of 2008-2009 and 2014-2015, by a decline in production volumes the number of employees at the enterprises of the republic was reduced to certain levels. Accordingly, the number of positions or employees required in those periods was minimal. In the post-crisis period of 2011-2012, the growth of the economy was based to a greater extent on resource rent, rather than on the technological development and was accompanied by a sharp increase in the demand for human resources (Gotsulyak I. F. a, Ignatjeva O. A., 2015, p. 177).

2. The cost of human capital. This directly includes the indicators of salary level for employees, and payroll history. In addition, this block includes an assessment of the differentiation of the labor force by salary level the value of which in many ways characterizes the functioning of the human environment and socio-psychological climate. The number and gain of created jobs with wages higher than the set threshold characterize the level of progressivity of the organization and its innovativeness. Moreover, the processes of innovation and formatting sectors of the economy, as a rule, begin with changes in its industrial complex. Also, the process of creating high-performance workplaces must begin with production industries. The impact of industrial growth in the rest of the economic complex will continue to provide a certain multiplier effect.

Figure 2 SYSTEM OF INDICATORS FOR EVALUATION OF HUMAN CAPITAL DEVELOPMENT IN THE BLOCK "ECONOMIC DEVELOPMENT"



The payroll history on workers at enterprises of the Republic of Tatarstan depends on the general economic situation. (http://tatarstan2030.ru, date of the application 03/2016) The labor market is the main source of capital and wealth accumulation in the country, and therefore an incentive for the interest of investors and the entire innovation development (Zubakov V.M., Mustafin A.N., 2015, p. 270). In times of crisis in 2008 and 2014 and in the post-crisis periods wage increase is reduced to 2-6% that in the context of inflationary impacts reaching 10 percent or more, leveled to negative levels. Thus, the rate of decline in real salary amounted to 96% in 2015. Low wage level does not stimulate a person to active actions, intensive labor, and even more so, to self-improvement.

Stress level in labour collectives increases in times of crisis due to workers differentiation by the level of salary. During the crisis of 2008-2009 excess of the level of salary paid to highest paid employees over the salary of the lowest paid workers has reached 16 times or more on the average in Tatarstan. In 2015, this option has already surpassed a twelvefold excess. This situation is caused, first and foremost, by a faster decline in salary of the lowest paid unskilled workers or employees whose work has no direct impact on the final results of activity of the economic entity (Ignateva O. A., Abdullin I. I., 2015, p.345).





In the case of building a technological development model for the economy of Tatarstan where the main profits will be brought by the knowledge, technology and human intelligence, the growth rate of salary of enterprises in the republic will increase at a slower pace, and according to optimistic forecasts, by 2018 will reach 108.2%. The basis of salary growth will be an increase in labour productivity. A clear chain of achieving economic growth should be formed where the primary link will be a human capital and highly productive work. This requires the establishment of appropriate environment for building intellectual capital. At the same time increasing the profitability of a human capital will be observed only in the process of accumulation of its intellectual potential.

3. The level of innovation activity of the environment for functioning of a human capital. Human capital development is directly related to the intensity of innovative activity of the organization enabling employees to raise the educational level and the performance of creative initiatives. In turn, the innovation potential of the organization is evaluated on the basis of sufficiency in the enterprise of all kinds of resources and intellectual capacity to implement innovation, thus without significant loss of rate of current production activity.

Economic activity of companies in the Republic of Tatarstan from 2008 to 2014 has increased by 35%. In 2014, every fifth company of the Republic bore costs on innovation and released innovative products. At the same time, investments in intangible assets the result of which should be the inventions, utility models, new technologies and software products do not have a stable dynamics and, furthermore, decreased in 2014 compared to 2008 by 1.7 times. The positive effects of these investments could be noticeable for several years and may bring significant income with appropriate returns.

Of course, investing in intangible assets may be performend only by investors with a relatively high level of capital. Therefore, most organizations use **c**ommercial technology exchange with foreign countries. As can be seen from Table 2, the propensity of enterprises of Tatarstan to import technologies for the period from 2008 to 2013 was tripled. In 2014, in connection with the sanctions and the difficult geopolitical situation, the acquisition of foreign technology was reduced by 15%.

Scientific and technological progress is the development of information and communication technologies in the sectors of the economy. Sure, it has a direct effect on the innovation activity of organizations.

Table 2 THE MAIN PARAMETERS OF THE INNOVATIVE ACTIVITY OF THE ENTERPRISES AND ORGANIZATIONS IN THE REPUBLIC OF TATARSTAN

	2008	2009	2010	2011	2012	2013	2014
Share of innovation-active organizations, percents	14,3	14,5	14,9	18,1	19,1	19,8	19,3
Investments in intangible assets of organizations, million roubles	1066,0	200,6	348,5	110,9	392,0	519,6	620,6
Number of personal computers per 100 employees, units	26	31	32	35	38	54	67
Import of technologies, units	45	55	55	64	122	135	115

Cross-sectoral integration achieved through information networks, enables enterprises to operate within the infrastructure of a new quality that expands the boundaries and scope of business, promotes the active dissemination of innovations. Computerization of enterprises in sectors of Tatarstan's economy from 2008 to 2014 increased by 2.6 times. In 2014, 67 computers accounted for every 100 employees responsible for processing documentation and other related functions. In the future, this figure will increase and eventually reach the absolute coverage of employees of this category by personal equipment. This contributes to cost reduction, intensification and labour productivity growth, stimulates a person to raise his/her the educational level.

4. Technological infrastructure of environment for functioning of the human capital. An important prerequisite for innovation development is the technical level of production equipment. Not all enterprises are able to develop new technologies independently. Organizations being in critical financial condition are unable to carry out the modernization of their production. Potential or "degree of readiness" of an economic entity to innovation activity is determined by the state of fixed assets, their movement and the degree of suitability.

Figure 4 THE STRUCTURE OF INVESTMENTS DISTRIBUTION OF A FIXED CAPITAL BY TYPE OF FIXED ASSETS AND DIRECTIONS OF THEIR RECONSTRUCTION AT ENTERPRISES OF THE REPUBLIC OF TATARSTAN IN 2014, PERCENTS



Figure 4 clearly demonstrates that human capital development in the upgraded production environment is accelerated. New equipment and technologies require appropriate qualification of the maintenance staff. Permanent investments are directed both to the new construction and the modernization and purchase of fixed assets. In Tatarstan, in 2014 enterprises used 62.4% funds to purchase equipment, and 21.5% to purchase vehicles. More than 70% of the investments for new construction have been directed to the construction of buildings and structures. Modernization of machinery and equipment is performed to a lesser extent; mainly the

acquisition of new equipment is carried out. This positive trend should lead to the minimization of quantity of obsolete equipment, improving the quality of the working environment for functioning of a human capital.





An employee of an innovation enterprise must operate in an environment with permanent changes and uncertainty. (Soifer V., 2011, p. 56) The trend in the quality of the working environment at enterprises of the Republic of Tatarstan is negative. As seen in Figure 5, from 2008 to 2014 the share of workers employed in harmful or dangerous working conditions have increased by 1.4 times. Every third employee engages in labour activities at an unsafe workplace. However, only 57.7% of workers in this category receive cash or any other kind of compensation. The dynamics of this indicator is positive, but the average growth rate is no more than one percentage point per year. Since 2008, the number of such citizens increased by only 11%.

The poor quality of the production environment is directly correlated with the general technological infrastructure and technological level of production development. As hardware upgrades, and permanent assets update, working condition of workers will improve. The slow development of this process is now caused by the general economic situation, and deficiency of the financial resources.

Industrial risks and physical development of human capital. The consequences of noncompliance of a human functioning environment to required standards are injuries, and increase in the number of occupational diseases. High probability of industrial risks discourages workers to be engaged in intensive labor, to improve the quality of work, and to develop their competencies. In turn, the deterioration of health of workers, partial or complete loss of functionality brings the physical and material damages to the employee him/herself, has an impact on the overall climate in the team, and reduces the company's financial performance.

Let's consider trends in the physical state of human resources as a result of industrial risks on the example of the Republic of Tatarstan:

Table 3TRENDS IN THE PHYSICAL STATE OF HUMAN RESOURCES AS A RESULT OF INDUSTRIALRISKS AT THE ENTERPRISES OF THE REPUBLIC OF TATARSTAN

	2010	2011	2012	2013	2014
The number of cases of temporary disability (per 100 employees), units	60,8	62,7	60,9	57,0	55,9
Persons recognized as disabled ones because of work-related injuries and occupational diseases (per 10,000 population), people	0,8	0,7	0,7	0,7	0,6

Table 3 shows that in the last five years at the enterprises of the Republic of Tatarstan there is maintained a positive trend on reducing the number of cases of temporary disability from 60.8 in 2010 to 55.9 in 2014 per 100 workers. On average, every second employee of an enterprise has received a sick leave during the year in case of illness.

The number of the facts of permanent disability owing to employment injuries and occupational disease also decreases. Providing for employees around the world with comfortable and safe working conditions is one of the main criteria for the success of the development of production and business in general.

CONCLUSIONS

In order to make purposeful and effective decisions on management of the development of human capital both at the micro and meso levels there is a need in objective information basis and analytical tools for the analysis of the current situation and planning for further actions. However, this mechanism works effectively when employees have an incentive to work qualitatively, and an employer has an incentive to adequately compensate for employees their quality efforts in the production (Mustafin A.N., 2015, p. 104). Programs including the measures on promoting the development of human capital should be economically and informationally substantiated. Such models can be the basis for the identification of "bottlenecks" in the development of human potential and improving its quality.

SUMMARY

Transition from a resource-based economy to an innovative path of development requires substantial investments to modernize the economy. However, due to budget limitations there is a problem of financial support and the development of the projects of innovative nature and mechanisms for investment in innovations and improvement of human capital quality (Akhmetshina E.R., Mustafin A.N, 2015, p.35). Causes and effects hindering an innovative development of organizations should be determined objectively, be quantified and have the possibility of economic and mathematical modeling.

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STANDARD APPLICATION PECULIARITIES FOR SUBSIDIARY INCOME TAXES

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ABSTRACT

1. In modern Russia, a growing number of companies apply international standards in order to present their financial statements. There is the problem of two formats of financial reporting standards simultaneous application for these companies - Russian and international ones.

The purpose of this paper is to analyze the practical application of the accounting provision "The accounting of settlements on profit tax" by a Comapny (AP 18/02) and the correlation of the methodology and generated values with IFRS standards (IAS) 12 "Income taxes".

2. In this paper we estimated the application practice of AP 18/02 "The accounting of settlements on profit tax" based on comparison methods, the system and logical-semantic analysis and synthesis, the comparison of methodology provided by Russian standard with international standard regulations.

3. The estimation of corporate methodology for the application of AP 18/02 "The accounting of settlements on profit tax", the main problems of the parallel use of Russian and international accounting standards were determined for company financial reporting.

4. The Company has the developed method of accounting standard application regulating the indicators of a financial reporting related to the income tax calculations.

5. The application of IFRS 12 for the preparation of corporate accounting with the subsequent consolidation purposes in international format requires a significant amount of parallel accounting work from a Company. The provision of compliance with IFRS requires the reforming of internal corporate finance management system, the creation of a new information flow logistics, and the increase of accounting process automation level, directed at responsible personnel training.

Key Words: Temporary Difference, Taxable Temporary Difference, Deductible Temporary Difference, Tax Base

INTRODUCTION

The presentation of information about the calculation of income tax in financial statements is intended to disclose the relationship of accounting and taxable income (loss) indicators and the differences between these indicators of a company activity. In Russian (financial) accounting such information is submitted in accordance with the Regulations on accounting "The accounting of settlements on profit tax" (AR 18/02) (Russian newspaper, 2003), which establishes the rules of development in accounting and the order of information disclosure about income tax calculations. In international practice, the accounting of income tax settlement is regulated by IFRS 12 "Income Taxes" (Russian newspaper, 2011).

The basis of AP 18/02 development has been taken The International Financial Reporting Standard IFRS (IAS) 12 was taken as the basis of AP 18/02 development. The basic principle of this standard is reflected in the financial statements of tax consequences in order to obtain more transparent, complete and reliable information about the economic status of an organization.

The scope of IFRS (IAS) 12 application is wider than the AP 18/02. The scope of IFRS (IAS) 12 includes other taxes; their calculation basis is a company profit. The principal difference between AP 18/02 and IFRS (IAS) 12 is the method of deferred tax assets and liabilities calculation.

METHODS

IFRS (IAS) 12 is based on the method of tax assets and liabilities calculation within a balance sheet. Deferred tax assets and liabilities are calculated on the basis of differences between the book cost of an asset or a liability and its tax base (balance method) (Deloitte and Touche, 2013, p.116; 9. The Future of UK Financial Reporting, 2011, p.16).

AP 18/02 uses the calculation method applied in the previous version of IFRS (IAS) 12. This is the calculation method, based on the indicators of financial result report (deferral method). The specified differences in difference determination distinguish significantly the practice of standard application for the provision of information on tax profit. Quite a long period of AP 18/02 action in Russia led to the formation of distinct corporate methods of its application. However, the companies which, for various reasons, also present their reports in IFRS format, due to the specified fundamental differences in standard norms have the problem of transformation concerning the relevant articles of the Russian reporting in IFRS reports. It seems necessary to provide the assessment of the current corporate practice reporting payments for income taxes in accordance with AP 18/02 and the related IFRS reporting issues.

The analysis is based on the practice of calculation accounting concerning the profit tax in a major Company performing the main activity in the field of truck leasing. The Company has been applying AP 18/02 since its establishment in 2005. Due to the fact that the company makes the part of the holding, it is also obliged to submit its individual IFRS reporting to the parent company in order to develop the group consolidated statement.

According to the accounting policy of the amount of the current income tax is determined according to accounting data on the basis of conditional expense (theoretical income) value for income taxes, adjusted by the amount of permanent tax liability (asset), the increase or decrease of the deferred tax asset and deferred tax liability within a reporting period. During the drawing up of information about temporary and permanent differences the comparison of data on the amount of income and expenses for accounting and taxation is performed. At that the difference are reflected by the appropriate entries during the calculation of income tax according to the types of fixed and deferred tax assets and liabilities. Deferred tax assets and liabilities are reflected in detail within a balance sheet (Karagod V.S., 2012, p.310).

To summarize the information about the settlements with budgets on income tax the appropriate sub-account to the account 68 "Taxes and Duties Calculations" is used.

The Company accounting uses the following registers for the calculation of income

tax:

- 1. Register for taxable temporary differences;
- 2. Register for deductible temporary differences;
- 3. Register for the calculation of differences in accounting and taxation at depreciation accrual;
- 4. Register for the calculation of differences at depreciation accrual arising at full repayment of fixed

asset value for tax purposes;

5. Register for the calculation of differences in depreciation accrual arising from the full repayment of fixed assets in accounting.

The composition of the applied accounting records demonstrates that a significant amount of appearing differences follows from different rules of depreciation recognition, and it requires the separation of the information in separate registers.

In accordance with AP 18/02 on the basis of accounting data on the financial result of the period, taking into account the tax rate the amount of the conditional expense (benefit) for income tax is determined. Further, based on the identified permanent and temporary differences the adjustment of the conditional expense (income) is performed according to the sum of permanent tax assets, permanent tax liabilities, deferred tax assets and deferred tax liabilities of the period. By adjustment the amount of the conditional expense (benefit) for income tax is brought to the sum of current income tax equal to the amount of income tax according to a tax return (Krylov S.I., 2010, p. 36).

Permanent differences of the reporting period are recorded in the accounting records of the Company separately (in the analytical account of the corresponding account of assets and liabilities accounting, with a constant difference at their evaluation). The list of permanent differences in the accounting of the Company revenues and expenses includes about thirty items. The recognition of permanent tax assets in the company are based on such most significant permanent differences as the amounts of income from the investments in other companies and the incomes of previous years.

The recognition of permanent tax liabilities in a company result are represented by such most significant permanent differences as the reserve sums for the impairment of financial investments, the difference in reserve amounts concerning doubtful debts for accounting and taxation purposes, the write-offs of fixed assets, representation expenses above standards, the costs related with a joint venture, etc. In IFRS 12 the concept of permanent differences is not used, but according to used concepts in a standard this is the difference between the accounting profit multiplied by the applicable tax rate and the tax on income (Improvements to financial reporting standards, published by Accounting Standard Board in November, 2010, p.41).

These differences, qualified as permanent in accordance with AP 18/02, may influence or not influence on the book cost of the related assets or liabilities. This cost is used to determine the differences in accordance with IFRS 12. If the difference between the book cost and tax value of an asset or a liability does not affect the profit of the following periods (it is a constant one according to AP 18/02), then its tax base is accepted as accounting one in accordance with IFRS accounting.

When the balance sheet method is used the difference is not developed in this case. Hence, no deferred taxes do not appear. Thus, the adjustments concerning the reflection of permanent difference influence in statements require the identification of such differences based on the balance method and the exclusion of their impact on deferred taxation (Wong, N., p.55).

In practice, the transformations of individual Company statement in IFRS format the tax balance is not drawn up. In order to identify the differences the book cost of an asset or a liability is used determined in accordance with RAS, which is adjusted to the tax base in the amount of differences that appeared as the result of the different revenues and expenses recognition rules in accordance with RAS and RF Tax Code. It is unlikely that such an approach may be regarded as a fully compliant one with IFRS; however, the transformation procedures are not regulated and are being developed by companies independently. The list of Company incomes and expenses according to which the temporary differences are developed is less detailed. It includes fifteen items, including four items concerning the differences due to different depreciation on fixed assets, leased, rented, withdrawn from the lease and own fixed assets. Other temporary differences appeared in respect of wage payment, social security and welfare (first of all, these are the expenses for the payment of holidays falling on two reporting periods for income tax), foreign currency exchange differences in conventional units, insurance and other expenses.

The deductible temporary difference arises from:

- 1. The depreciation of fixed assets which are leased. This difference appeared due to the establishment of fixed assets useful life in a tax statement longer than in accounting. Therefore, when you use a straight-line method in tax accounting and accounting, but at different useful lives, the amount of fixed asset depreciation will be different in accounting and tax accounting.
- 2. The depreciations of fixed assets, which were withdrawn from the lease. Different useful lives were also the reasons for the difference between tax accounting and accounting. In tax accounting the useful life of a fixed asset is greater than in accounting;
- 3. The costs of reserve creation for the payment of upcoming holidays in accounting. In accordance with the accounting policy for taxation purposes the reserve for the payment of upcoming holidays is not developed;
- 4. Foreign exchange difference costs. In accounting and tax accounting they are different due to the different periods of their recognition.

The revealing of temporary differences and the recognition of the related deferred taxes assumes the control of appearance, maturity and the write-off of deferred tax assets and deferred tax liabilities (Cutting through UK GAAP, 2013, p.309).

The algorithm of current tax calculation corresponding to AP 18/02 in respect of accounting data registers is reflected on Figure 1.

Figure 1 THE PROCEDURE OF CURRENT INCOME TAX CALCULATION CONCERNING THE SUBSIDIARY ACCORDING TO THE ACCOUNTING DATA



The absolute values of indicators (in thousand rub.) for the calculation of Company current income tax are reflected on Figure 2.

It should be noted that the calculation includes the balanced performances of temporary differences and deferred taxes, taking into account the ones occurred, canceled and written off during the reporting period.





In particular, the negative values of the deductible temporary difference and deferred tax asset shown in the calculation reflect the situation of amount exceeding repaid during the reporting period of differences over the amount of occurred ones, i.e., the situation when deductible differences are deducted actually by the implementing the economic benefit of deferred tax assets. The negative value of permanent differences, developed contrary to traditional notions of the relationship between accounting and tax income and expenses, reflects the excess of permanent tax assets in comparison with permanent tax liabilities during the considered period. This means that tax revenues, leading to permanent differences were less than accounting ones and tax expenditures were more than accounting ones. The indicators presented in the calculations were reflected in the relevant articles of accounting (financial) statement forms of the Company - in a balance sheet and an income statement.

CONCLUSIONS

The definitions of temporary differences are different in Russian and international standards. We do not aim to analyze all the features of this category in two reporting formats, we pay your attention to the fact that the existence of differences for temporary difference identification, for the recognition of deferred taxes, and for the assigning them to an asset, liability or equity, for the registration of tax rates and other differences leads to the fact that the transformation of reporting articles associated with the calculations of income tax by adjustments is virtually impossible. During the preparation of individual IFRS reports the Company reverses these articles and calculates parameters anew in accordance with international standards (Brovkina N.D., 2012, p.155).

SUMMARY

Thus, the Company applying AP 18/02 in accordance with Russian accounting legislation, has a developed method of emerging difference identification and classification, the accounting of deferred taxes repayment and cancellation, the calculation of the current income tax according to the accounting ledgers, the presentation of parameters concerning the estimation of tax profit in the accounting (financial) statement. The use of IFRS (IAS) 12 to prepare the

corporate accounting for consolidation purposes in the international format requires a significant amount of parallel accounting work from a Company. The provision of compliance with IFRS involves the creation of new information flow logistics, the increase of accounting process automation level, directed at responsible personnel training and the reforming of internal corporate finance management system as a whole.

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CONCEPTUAL BASES FOR CREATION OF LOGISTIC INNOVATIVE CENTERS FOR AGRICULTURAL PRODUCTION

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ABSTRACT

The current economic and political situation has raised a topical issue of food sovereignty and creation of import-substituting production of agricultural products in Russia. It is supposed to support the construction of logistics centers for Russian agricultural products. Although many of the existing and being created logistic centers were declared to be innovative, they have no such modern logistics innovation as the integration. The conceptual basis for the creation of a logistics center is integration with transformation of a center according to the business concept of Supply Chain Management (SCM).

The paper presents a number of main possible ways of cooperation between enterprises for the organization of inter-firm integrated logistics:

1. Conducting joint business following the example of the experience of Japanese firms which create the so-called "keiretsu": a group of companies working together, but without a formal partnership.

Analysts argue that the concentration of production, capital, and modern technologies in a functionally-integrated conglomerates "keiretsu" helps to reduce costs by increasing productivity and achieving economies of scale; groups intensively compete in all areas that stimulates the desire to penetrate in new markets.

2. Creation of syndicates which is a form of alliance business related mainly with products sales.

The main purpose of the syndicate is to expand and hold position in markets, adjust the volume of output within the syndicate and the price of external market outlets. As a rule, a syndicate organizes a single selling service to which the members of the syndicate must hand over at a predetermined price and quota their products for joint sales. In some cases management of the syndicate arrange the purchase of raw materials and other products for the members of the syndicate at the expense of incomes raised from the sale of their products. Creation of innovative logistics centers for agricultural products will:

- 1. contribute to addressing the issue of food sovereignty and the establishment of import-substituting production of agricultural products;
- 2. provide low-cost, environmentally friendly agricultural products of own production;
- 3. create more jobs;
- 4. collect additional tax revenues to the budget;
- 5. receive a powerful stimulus to revive and support domestic agricultural producers.

Key Words: Logistics Center, Supply Chain Management, Inter-Organizational Logistics Organization

INTRODUCTION

Currently, the need for creation of logistics centers is not in doubt. There are several reasons for that.

Firstly, the problems in agriculture which had accumulated over the past 20 years. In particular, the production of local manufacturers of food products often do not meet the requirements of retailers in their assortment and quality characteristics, delivery stability and times, and marketing support. Transaction costs of local producers are also high (Baker Peter, Croucher Phil, Rushton Alan., 2010, p. 664). In local markets there are also disintegration of enterprises in various fields of activity related to the production and sale of food products, and being units of a material supply chain, and fragmentation of material and information flows (Christopher M., 2016, p.310). All this hinders wide penetration of local production into the large retail chains. Existing logistics centers are not able to solve this set of problems as they are originally focused by their functions to other tasks far from the use of modern methods and approaches used in logistics, marketing, and management.

Secondly, the current economic and political situation caused by the events in Ukraine, raised the topical issue of food sovereignty and establishment of import-substituting production of agricultural products.

Logistical centers of agricultural production are now created in many regions of the Russian Federation. However, although many of them are declared to be innovative, they have no such modern logistics innovation as the integration.

Thirdly, the Russian agriculture is in complete technological dependence: agricultural machinery, plant protection products and many more are mainly imported.

The conceptual basis for creation of a logistics center is the integration with its transformation according to the business concept of Supply Chain Management (SCM). Integration involves formation and management of through-flow of food products from raw materials sources to end consumers, i.e. management of the entire supply chain from a manufacturer of agricultural products including their processing and storage in the logistics center up to final consumers, retail customers (Harrison A., Remko Van Hoek, 2008, p.343). Thus all parts of the supply chain appear as a single entity, without competing with each other, but co-operating and working according to demands of final consumers.

Results expected from creation of an innovative logistics center for agricultural products: solving the question of food sovereignty and establishment of import-substituting production of agricultural products, provision with a cheap, environmentally friendly agricultural products of own production, additional jobs; additional tax revenues to the budget, and a powerful stimulus to revive and support domestic agricultural producers.

METHODS

We used the following methods in the work:

1. Analysis and comparison of the operation of logistics centers in the Russian Federation (Table 1).

Table 1
THE PLANNED LOGISTICS CENTERS FOR AGRICULTURAL PRODUCTION IN THE RUSSIAN
FEDERATION

Construction site	Project scope	Project cost
Republic of Tatarstan, city of Kazan	Logistics center for agricultural products "Agromir Kazan"	9 billion rubles
City of St. Petersburg, Krasnoselsky District	Logistics Innovation Center for agricultural products LLC "Agropolis Sever-Zapad"	15.2 billion rubles
City of Penza	Logistics center for agricultural products	1. 5 bln. Rubles
Voronezh region	Logistics center for agricultural products	15 billion rubles
Omsk region	Logistics Distribution Innovation Center	10 billion rubles
City of Vladimir, microdistrict "Yurievets"	Logistics center for agricultural products	200 million rubles
Smolensk region	Logistics center for agricultural producers	112 million rubles

Analysis of ways on collaborating companies for the organization of inter-firm integrated logistics:

- 1. Joint business following the example of the experience of Japanese firms which create the so-called "keiretsu": a group of companies working together, but without a formal partnership.
- 2. Create syndicate or a form of alliance business related mainly with sales and widespread mainly in the extractive industries, agriculture, and forestry.
- 3. The Russian experience of integration in agricultural production, or consumer cooperation. In the 90s the main operator on harvesting and processing of agricultural products and wild plants, and servicing the rural population was cooperation, which in today's environment has lost its position.

RESULTS AND DISCUSSION

Currently, great attention is paid to the creation of logistics centers for agricultural production. On behalf of the President, the Government of the Russian Federation (Decree No. 1421 dared 19/12/2014) has amended the "State program of agricultural development and regulation of agricultural products, raw materials, and food markets for 2013-2020" which provides for a new subprogram "Development of wholesale and distribution centers of social catering system infrastructure" (www. pravo. gov. ru., date of the application 03.2016).

In Tatarstan, there will be erected a unique, and largest in Russia logistics center for agricultural products "Agromir Kazan" with area of 148 hectares (http://www.logisterra.ru/news/view/krypnejshij-v-rossii-logisticheskij-centr-postroyat-vtatarstane, reference date 18.04.2016). The project will be fully implemented by 2021. The complex will comprise pavilions for wholesale trade of fruits and vegetables, meat and fish, warehouses, areas for long-term storage and processing of agricultural products, parking for cars and trucks, a trade and exhibition center with offices, restaurants, and a hotel complex. The logistics center will serve not only Tatarstan, and also neighboring regions of the Volga River basin. Launch of the first stage of the project "Agromir Kazan" will commission more than 117 thous. m² of commercial space, create more than 650 jobs. In general, in the construction site

there will be created 357 thous. m^2 of retail space and more than 2 thousand jobs.

In St. Petersburg, LLC "Agropolis Severo-Zapad" has received permission to build in the Krasnoselsky district a logistics innovation center for agricultural production. The company will invest 15.2 billion rubles in the construction of a complex of the buildings intended for reception, storage, processing and marketing of agricultural products.

Near the city of Penza there will be a logistics center for agricultural production. The distribution center will occupy an area of 40 thousand m^2 . It is planned to invest in the project about 1.5 bln. rubles.

In the Smolensk region there will be built a logistics center for agricultural producers. It will make possible to solve the key problem of Smolensk agricultural producers, namely, the problem of marketing. Now most of the farmers are forced to sell their products to resellers as the market is very difficult to break in, and processors refuse to work with small-scale enterprises.

Moscow JSC "Prigorodnoye" intends to build in the Voronezh region a logistics center for the agricultural products for 15 billion rubles by 2017. The investment project includes: construction of class "A" and "B" warehouses on 950 thousand m^2 , class "B+" office spaces on 20 thousand m^2 and shopping spaces on 25 thousand m^2 , the hotel complex with area of 5 thous. m^2 and a gas station. Experts are convinced that the implementation of such a project will require the participation of the state capital.

In the Omsk region there will be built a logistics distribution innovation center for processing and marketing of agricultural products. Investor of the project is LLC "S-Fruit Alliance". The volume of investments is 10 billion rubles (http://mcx. Ru, reference date 18. 04. 2016).

This list can be continued. It shows the importance at the present stage of creation of logistic centers for agricultural production.

It should be noted that the logistics centers previously created or being under construction at the moment are not an innovation as such in the full sense of the word. Although many of them are declared to be innovative, but they cannot be referred to a modern logistics innovation consisting in an integration.

Integration of logistics activities consists in uniting together the efforts of the company's supervision manpower, its business units and logistics partners ("three parties" in logistics) for end to end management of main and accompanying flows in an integrated business structure: "design - purchase - production - distribution - sale -service".

Now, the concept of integrated logistics in the Western business has been transformed into an innovative business concept of Supply Chain Management (SCM).

Designed and created logistics centers are and will be a wholesale and retail trading platforms or wholesale and logistics centers for delivery and storage of agricultural produce, its processing and freezing.

No modern concepts of integrated innovative logistics will help if not to solve the problems of an agricultural producer.

Russian agriculture is in complete technological dependence. In Russia, imported plant protection products, veterinary drugs, premixes for animals are used, there are no many seeds, work on breeding livestock was stopped. Agricultural machinery, tractors and harvesters are also mostly imported. This is the case of more advanced agricultural enterprises and farms. With regard to private households which account for about 50% production of milk, cattle and poultry for slaughter, 25% eggs, and 70% potatoes and vegetables, and now they have to sell most of

their products to resellers at very low prices, as it is very difficult to break in the market, and processors refuse to work with small-scale enterprises. As a result, they suffer losses and are shipwrecked adding their farms to the abandoned lands throughout Russia.

CONCEPTS ON CREATION OF LOGISTICS CENTERS

Innovation in Logistics Centers

Integration of logistics activities involves the formation and management of through-flow of food products from raw materials to end consumers, i.e. management of the entire supply chain from a producer of agricultural products, including processing and storage in logistics centers, to a final consumer, i.e. a retail customer. Upon that, all parts of a supply chain appear as a single entity without competing with each other, and cooperating and working for a final consumer. To ensure a successful management of the entire supply chain there should be a well-defined inter-organizational coordination and cooperation (Lambert D.M., Stock J.R., EllramLi.M., 2001, p.640).

Inter-organization logistical coordination is a coordination of actions of a focal (center) company (logistic center), agricultural producers, suppliers, customers, and logistics agents (including on conflict resolution) to achieve the objectives of the logistics system (Figures 1 and 2) (Dybskaya V.V., Zaitsev E.I., Sergeev V.I., Sterligova A.N., 2013, p. 944).



Figure 1 INTER-ORGANIZATION LOGISTIC COORDINATION

CRM - Customer Relationship Management VMI - Vendor-managed inventory

Consumer

Level 2

Figure 2 TYPES OF SUPPLY CHAINS



Establishment of a Network

Supplier

Level 2

Further development of the innovative integration leads to creation of a logistics center network.

<----> SCOR-model ----->

Logistics network is the complete set of links of the logistics system between which the relationships on the primary or concurrent flows as part of controlling or designing the logistics system (supply chain) are established. Schematically, the logistics network is shown in Figure 3 (Sergeev V.I., Domnina S.V., Dybskaya V.V., Zaitsev E. I., 2013, p. 664).

Figure 3 NETWORK STRUCTURE OF A SUPPLY CHAIN

NETWORK STRUCTURE OF SUPPLY CHAINS



Integration of Agricultural Producers into Associations

There are several basic ways of collaborating companies for the organization of inter-firm integrated logistics.

The simplest of them is conducting joint business. In this respect, the experience of Japanese firms is of interest that creates the so-called "keiretsu", or a group of companies working together, and without their formal partnership.

Today "keiretsu" is a large financial-industrial and trade conglomerates which have decisive importance for the Japanese economy. Their formation went through the concentration of commerce and industry groups ("sogosesya") around the banks Fue, Daiichi, Sanwa and Tokyo Bank by implementing a strategy of consolidation within groups and mutual equity upon escalating volume of transactions between group companies. Analysts argue that the concentration of production, capital and modern technologies in a functionally-integrated conglomerates "keiretsu" helps to reduce costs by increasing productivity and achieving economies of scale; there is intense competition between groups in all areas that stimulates the desire to penetrate in new markets. (M. Baskakova, 2004, p. 98)

Of interest is creation of a syndicate which is a form of alliance business associated mainly with sales. The main task of the syndicate is to organize joint marketing of products (oil, coal, iron ore, grain, cotton, etc.). As a rule, a syndicate organizes a single selling service to which the members of the syndicate must deliver their products at a predetermined price and quota for joint sales. In some cases, syndicate management arrange the purchase of raw materials and other products for the members of the syndicate at the expense of money raised from the sale of their products. (Waters D., 2003, p. 364)

There is also the Russian experience in the integration of agricultural production: it is consumer cooperation. In the 90s the main operator on the harvesting, processing of agricultural products, servicing of the rural population was the co-operation which in today's environment has lost its positions (Vakhitov K.I., 2010, p.400).

It is clear that only a comprehensive innovative approach can solve the current problems of production and sales of high-quality, environmentally friendly agricultural production and ensure food security of the country. (Ghiani G., Laporte G., Musmanno R., 2004, p. 367) According to the request of the Ministry of Agriculture, replacement of imported products came under Russian sanctions requires over 600 billion rubles. However, this will not fully solve the problem if innovative, integrated logistics systems and networks in the food sector would not be created on the basis of existing and newly built logistics centers.

CONCLUSIONS

Creation of innovative logistics centers for agricultural products will:

- 1. contribute to addressing the issue of food sovereignty and the establishment of import-substituting production of agricultural products of the country;
- 2. provide low-cost, environmentally friendly agricultural products of own production for the regions;
- 3. create more jobs;
- 4. collect additional tax revenues to the budget;
- 5. receive a powerful stimulus to revive and support domestic agricultural producers.

SUMMARY

The concept of creating logistics centers of agricultural production presented in the paper includes several components. Firstly, it is an innovation in the logistics centers that suggests the integration of logistics activities, i.e. management of the entire supply chain from the producer of agricultural products, including the processing and storage in the logistics center, to a final consumer which is a retail customer. Secondly, the creation of a network of a logistics center, that is, the full set of links of the logistics system between which the relationships on the main or concurrent flows as part of controlling or designing the logistics system (supply chain) are established. Thirdly, the integration of agricultural producers in association. Upon that, only a comprehensive innovative approach can solve the current problems of production and sales of high-quality environmentally friendly agricultural production and ensure food security of the country

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TRANSACTION COSTS IN THE INTERACTION OF LOGISTICS AND MARKETING IN THE PROCUREMENT

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ABSTRACT

The individual solutions in the field of logistics and marketing may not be the same, and even confront each other to some extent that should be considered during the coordination enterprise marketing and logistics services. Supply is one of company main activities in any industry, so the provision of an efficient interaction between logistics and marketing services in the procurement is of particular importance. Taking into account the current development of logistics and marketing within the cross-functional interaction improvement it should be noted that the transaction costs make an integral part of this interaction in procurement activities.

Having analyzed the types of procurement activities and having distinguished the responsibilities of logistics and marketing, the article specifies the types of transaction costs arising during the operation of these services and which are responsible for their size. On the basis of logistics and marketing service influence differentiation, the ways of transaction cost optimization are developed, which may lead to the decrease of an enterprise overall logistic costs:

- 1. The reduction of information search transaction costs through the use of an e-procurement system.
- 2. The reduction of transaction and coordination costs, registration and paper document drawing up costs through the introduction of electronic documents, which will facilitate the coordination according to conflict parameters, will allow eliminating the repetition of the same operations.
- 3. The reduction of transaction costs at electronic procurements. The conclusion of contracts with suppliers for a long time, the provision of supplier guarantees to a company will allow to reduce this type of costs.

The transaction costs study at the enterprises revealed that the efficiency of supply activity improvement will contribute to the process of these costs management at the separation of logistic and marketing service functions. The ways of transaction costs optimization are developed, taking into account the relationship of marketing and logistics in the following aspects:

- 1. Marketing tracks and defines the appeared demand and logistics provides the physical promotion of demanded supply commodities;
- 2. Marketing poses the problem of the system approach to the organization of product distribution, and logistics studies the methods of technical and technological integration of all product distribution participants.

Key Words: Transaction Costs, Marketing, Logistics, Optimization of Transaction Costs

INTRODUCTION

For years the relationship and the interaction of marketing and logistics is discussed in scientific literature. These fields of science are deeply integrated, while carrying out their own specific functions.

Individual solutions in the field of logistics and marketing may not be the same, and even confront each other to some extent. This should be considered at the coordination of enterprise marketing and logistics services. The absence of cooperative relations between company departments, their separateness, and their autonomy of operation leads to the loss of customers (Andrianova N.V., 2014, p. 784).

According to the views of many scientists marketing prepares the conditions for the successful operation of a company at the market, and logistics brings goods and services to consumers physically.

An effective management of an enterprise is impossible without a coherent toolbox of marketing and logistics management. However, logistics and marketing have their own specific tools, technologies, so management shall be treated in a differentiated way.

There is some consistency in logistic and marketing solutions. So before the development of the product distribution process, you must make a decision about the production of products or its purchase with a subsequent resale which makes the part of marketing competence. Let's represent the distribution of marketing and logistics functions in the industrial and economic activities of enterprises and organizations in Table 1 (Christopher M., Peck H., 2003, p.152).

Supply is one of company main activities in any industry, so the provision of an efficient interaction between logistics and marketing services is particularly important in procurement.

Table 1
DISTRIBUTION OF MARKETING AND LOGISTICS FUNCTIONS IN THE PRODUCTION
ACTIVITIES OF A COMPANY

Item №	Function	Operation	Responsibility	
1	2	3	4	
1		Market analysis		
	Study performance	Analysis of goods	Marketing	
		Service analysis		
		Analysis of potential consumers		
		Analysis of competitors		
		Search for suppliers		
2	Selection of material resource	Evaluation of suppliers	Marketing	
	sources	Selection of suppliers	Marketing Logistics	
3		Determination of transportation means		
	Delivery of material resources	Selection of transport means	Logistics	
		Route selection		
		Development of new products	Marketing	
4	Production process	Supply planning		
	1	The distribution of material resources	Logistics	
		The movement of material resources in production		
5		Search for new markets	Montrating	
		Search for distribution channels	Marketing	
	Product sale	Analysis of markets and distribution channels		
		Evaluation and selection of markets	Marketing	
		Evaluation and selection of distribution channels	Logistics	
6		Determination of transportation means	T	
6	Manufactured product	Transport vehicle selection	Logistics	
	denvery	Traffic route selection		

On the basis of marketing and logistics relation analysis, the scheme of their interaction was developed in the areas of procurement and distribution (Fig. 1). In addition to the functional interaction, the interaction of marketing and logistic complex is represented according to their main components.

Knowing the elements of the marketing complex "4P" and similar logistic complex "7R" they revealed that the logistics and marketing complexes are related by product, placement and costs (Christopher M.Logistics and Supply Chain Management, 2016, p. 310; Harrison A., Remko Van Hoek, 2008, p.343).

Taking into account the current development of logistics and marketing in order to improve the cross-functional interaction it should be noted that the transaction costs in procurement activities are an integral part of this interaction. It is impossible to determine the principles of logistics system operation without them, which business processes take place in it, and the principles of their management.



Figure 1 INTERACTION OF MARKETING AND LOGISTIC UNITS

The development of transaction costs theory as an integral scientific concept is primarily related to the work of such researchers as R. Coase (Coase Ronald H., 1937, p. 386), D. North, J. Wallace (Wallis J.J., 198), P. Milgrom, J. Roberts (Milgrom P., 1992), K. Dahlman (Dahlman Carl J., 1979, p. 141), O. Williamson (Williamson O.E., 1985, p. 278), G. Stigler (Stigler, George, 1961, p. 213), M. Jensen, W. Meckling (Jensen M.C., Meckling W.H., 1973, p. 125) and others.

However, the existing definitions do not characterize the transaction costs from the standpoint of modern logistics development and does not take into account the principles inherent to its functional area - "supply logistics". Therefore, it is urgent to clarify and summarize the definition of this concept.

The transaction costs in the supply logistics are the costs (explicit and implicit) arising from the interaction between any versions of counterparties, aimed at material flow management and related with them by information and financial flows through the coordination, the integration, and the optimization of the logistic system in order to achieve corporate goals (Shutova P.A., 2009, p. 45).

METHODS

The theoretical and methodological basis are the concepts and methods developed by domestic and foreign scholars on the issue of information reflection, the assessment and the management of transaction costs, the results of fundamental and applied research. The data of specialized scientific publications, the information published in domestic and foreign scientific literature and periodicals in the field of economics and logistics, the statistical data of Federal State Statistics Service, the materials of scientific-practical conferences, the information placed on the Internet sites, the primary information collected by the author at the industrial enterprises of Russia were used during the study.

RESULTS AND DISCUSSION

After the analysis of procurement activity types and after the differentiation of logistics and marketing responsibility fields (Figure 2), let's determine the types of transaction costs arising from the operation of these services which are responsible for their value:

- 1. The costs of information search (marketing responsibility). They arise when there is not enough information to select an appropriate option from the available alternatives, and there is a need to spend resources for the search of missing alternatives. In supply logistics this is the cost of time and resources for data obtaining and processing concerning supply item prices, the items of supply available at the market, suppliers logistic intermediaries, as well as the losses associated with the incompleteness and the imperfection of the acquired information.
- 2. The costs of electronic procurement (responsibility for marketing) are the costs on an enterprise interaction with suppliers within e-procurement system. These costs are made up of personnel time costs to implement e-procurement, the expenses for communication services, the cost of e-procurement system implementation support and subscriber's fees.
- 3. Coordination costs (responsibility for marketing and logistics) are the costs arising from the accordance of enterprise operations with counterparties after the conclusion of agreements on controversial issues in the supply logistics arising in a working order, as well as between the groups of companies belonging to the same holding.
- 4. Registration and paper document drawing up costs (responsibility for marketing and logistics) the time and material costs associated with registration and the drawing up of paper documents during the interaction of counterparties.

A large number of transactions in supply logistics is associated with the registration and the drawing up of numerous papers. Considering an isolated case of a document drawing up (e.g., an extract from the pass to a company parking), spent transaction costs may have little value for an enterprise, but in the aggregate the level of registration costs and paperwork may reach very high values.

After the analysis of transaction cost types arising from the operation of the logistic and marketing services, it should be noted that the effective interaction of these services may lead to an optimal level of transaction costs, which in its turn will result in the overall costs reduction of an enterprise.

Over the past decade the increase in logistics costs of many western companies is considerable for such logistic functions as transportation, order processing, information and computer support, as well as logistic administration. Thus, the share of the logistics component in the cost of domestic products may reach 60%.

In Europe, the cost of everything related to the delivery, storage and warehousing make 15% on the average. The reasons of such a contrast are increased prices because of transportation and storage costs and the delivery terms failure which became a typical phenomenon in the relations between a Russian supplier and a Russian consumer (Tomino T., Hong P., Park Y.W., 2011, p. 204).

According to practice, the purchase of material resources, the cost of material purchase by most industrial companies in modern conditions account for an overwhelming share of production cost. Depending on the industry, they range from 40 to 60%. In this regard the consideration of transaction costs optimization is a relevant one in supply activity.





Knowing the value of the transaction costs in the procurement for each type and separating the impact sphere of logistics and marketing services, you can work out the ways to optimize transaction costs, which will result subsequently to the reduction of overall logistic costs of an enterprise (Table 2).

	Transaction	
Transaction cost type	cost	Events
	optimization	
1. Transaction costs of information search	TC _{IS} →extremum	When you have a lot of information about suppliers at the market with the optimum costs of information search, it is possible to find a large number of suppliers, which will lead to the increase of a more favorable contract conclusion probability with suppliers (for example with reduced prices for supply items)
2. Transaction costs of coordination	$TC_{Coord.} \rightarrow min$	The introduction of an electronic paperwork will reduce the transaction costs of coordination.
3. Transaction costs of paper document registration and processing	TC _R →min	The introduction of electronic paperwork will allow free some staff. This measure will reduce the registration and paper document processing transaction costs.
4. Transaction costs at e-procurement	$TC_{E-p} \rightarrow min$	The conclusion of contracts with suppliers for a long time, the provision of guarantees by a supplier for a company will reduce this type of costs.

 Table 2

 TRANSACTION COST OPTIMIZATION MEASURES

The process of transaction costs control taking into account a clear separation of logistic and marketing service functions helps improve the efficiency of supply activities.

CONCLUSIONS

It was found that the relationship of marketing and logistics is traced in the following aspects:

- 1. Marketing tracks and defines the demand and logistics provides the physical advancement of demanded supply items quantity;
- 2. Marketing poses the problem of a system approach to the organization of product distribution, and logistics studies the methods of technical and technological integration among all product distribution participants.

At that the assertion about the paramount role of marketing or logistic in procurement system will be a wrong one (Trevor S.H., Jamison M.D., Faizul, H. Nikhil A.P., 2008, p. 506). In our opinion, on the one hand, the logistic activity is subject to the marketing strategy at a company, and, on the other hand, the marketing complex is functionally dependent on logistics.

The accordance of logistic and marketing activities will reach an optimum level of transaction costs which will allow increasing the efficiency of an enterprise.

SUMMARY

The management of transaction costs in procurement taking into account a clear division of logistics and marketing interaction spheres reaches the level of the priority issues during the organization of an enterprise effective activity. In modern economy due to the increasing complexity of economic relations at the interaction of logistics and marketing the transaction costs will take higher values. The assessment, accounting and optimization of transaction cost values with a clear division of logistics and marketing responsibility will enable managers to make proper decisions during the management of common enterprise costs. The reduction of overall costs will influence the activity of an enterprise as a whole positively.

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STUDY OF «LEAN PRODUCTION» TECHNOLOGY APPLICATION AT DOMESTIC AND FOREIGN ENTERPRISES

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ABSTRACT

The study of "Lean Production" technology application experience at foreign and domestic enterprises was performed. The features of lean manufacturing technique application and implementation are revealed at foreign and domestic enterprises in the context of eight criteria. At the country level identified the common grounds in this process are determined at a country level and specific tools are determined implemented at enterprises.

A significant gap and lag of Russian companies in the implementation of lean manufacturing technology tools is determined. The main reason of this is an inadequate understanding of scientific and methodological principles concerning "Lean production" concept and its philosophy by domestic experts, the lack of interest among owners in the process of production modernization and the availability of a formal approach to the implementation of lean manufacturing technology among managers.

The ways of "Lean production" technology implementation process are determined at domestic enterprises. The main way of a Russian company development is the vector of its ideology and corporate culture development based on the principles of lean manufacturing, as well as on production specifics focused on certain reserves of production components, on the mentality of a Russian consumer, who will eventually lead to transition into a qualitatively different development trajectory with the obtaining of a hopping systemic effect.

Key Words: «Lean Production» Technology, Technology Tools, Especially the Introduction, the Domestic Experience, Corporate Culture

INTRODUCTION

In modern world, the overwhelming majority of companies which are the world leaders in their respective industries (Toyota, Ford, Boeing, Airbus, GE, Scania, Alcoa, Xerox and others) apply actively the lean manufacturing system (D.P. Womeck., 2004, p. 473; Sheree Hanna, 2014). Russia fell behind other countries in terms of familiarity with lean manufacturing for decades. There is a high demand for it today. First, it's the desire to make up for lost time, and secondly it a vital necessity. This is especially true for large industrial enterprises with the heritage of the past in the form of mass production with its large batches, worn-out equipment and an excessively large staff of employees. I.e. those companies who understand that they will not be competitive if they do not begin to take immediate measures. There is an increase of domestic enterprise number in recent years. These enterprises upgrade their quality management systems, using the concept of lean manufacturing. There are their own peculiarities of lean production concept in different countries (Michael A. Cusumano, 2016). The experience of lean production implementation in Russia and in the developed countries has an important feature. A

great importance is provided for lean manufacturing tools at Russian enterprises. And a great attention is given to the development of lean manufacturing ideology and corporate management culture at foreign organizations (Safronova K.O., 2012, p. 431). However, the tools of lean manufacturing do not work without an ideology. The primary issues are the issues of thinking and the implementation of rational proposals.

RESEARCH METHOD

Paper objective: to investigate the application and implementation of «Lean Production» technology issues at enterprises. The study was conducted using the method of article literary review and other materials on the use and the implementation of "Lean production" technology at different branch enterprises in different countries. The resulting material was subjected to the comparative analysis in order to identify the specific application of manufacturing technique at enterprises. This allowed proposing the ways of the studied technology application improvement during the next stage.

STUDY RESULTS

"Lean production" system includes a large number of tools and techniques from these approaches, and often management approaches (Kuzmin A.M, 2007, p. 19; Nikulina O.V., Konovalenko D.G., 2014, p. 372; Michael Ballé, James Morgan, and Durward K. Sobek II, 2016). Moreover, the composition of applied tools will depend on the conditions of particular enterprise specific objectives. The table below shows the features of "lean production" concept application in different countries.

Country	Tools implemented by foreign companies	«Pioneer» companies
Brazil	Kaizen, Just-in-time, TQM, ISO 9000	«Fiat Supplier Simple»
Germany	«Just-in-time», «Just-in-sequence delivery to production lines», flow charts, schedules emergency plans per business/customer.	«Volvo Production System»
Canada	Just-in-time	«Canadian Automotive Production»
China	Kaizen, система менеджмента качества, ISO 9001:2008, Kaizen, 5S, SMED, TPM, Kanban	«Covidien», «Lenovo», «Ingersoll Rand», «Metso», «Suntory»
Russia	Kaizen, Kanban, push flow, TPM, система 5S, VSM, visual control, standardization, Just-in-time, TQM	«GAZ production system»
USA	pull system, visual management, standardize work and safety, kaizen, Lean Manufacturing +Six Sigma	Lean Project DeliveryTM System, Flexible Manufacturing System
Sweden	Total Quality Management, ISO 9000:2000, Just-intime, standardize work and safety, kaizen	Model for an effective supplier – buyer relationship
Japan	Kaizen, Kanban, Handling circles, visual, management, standardization, Just-in-time, TQM	Toyota Production System, Honda Production System and etc

 Table 1

 COUNTRY FEATURES OF "LEAN PRODUCTION" CONCEPT APPLICATION

Each company uses a specific set of tools (Lean manufacturing, 2016). In the future, these tools become the components of the operating system, which has a unique name of the company using these tools (Jeffrey K. Liker, 2004, p. 268). The first Russian companies which applied lean manufacturing are the Gorky Automobile Plant ("GAZ Group"), VAZ, KAMAZ, Rusal, EvrazHolding, Eurokhym, VSMPO-AVISMA, OJSC "KUMZ", SeverStal-auto, etc. The interest in "lean production" concept was caused by an increased inflow of leading foreign companies to the Russian market, which use the concept methods. In order to be competitive, Russian companies have to optimize their production and business processes (Razumov-Razdolov K.L., 2008, p. 16; Tulchinsky S., date of appeal 10.10.2014).

As a rule, Russian companies experience significant difficulties at the implementation of lean production rules. Often their reasons are the following ones: a) the lack of methodology deep understanding among the experts who undertake to carry out lean-conversions, and focus primarily on symptoms; b) the lack of methodology adaptation to the peculiarities of a particular organization, the use of the most well described procedures to deal with any organizational problems; c) the lack of a systematic approach in the transformations of an organization, the use lean manufacturing system as a set of operational-level instruments; d) the introduction of a formal project with formal objectives and formal outcomes; d) the lack of interest among owners and top managers; g) the complexity of the entire lean system architecture understanding (philosophical principles, systems and tools, the real production problems they solve); h) the resistance to changes on the part of employees in relation to the fear of non-compliance with new requirements and the fear of losing their jobs, as well as the reluctance to increase the loads at the same salary (Kuzmin A.M, 2007, p. 19; Nikulina O.V., Konovalenko D.G., 2014, p. 372; Razumov-Razdolov K.L., 2008, p. 16).

After the analysis of information from different sources about the peculiarities of lean production implementation in the management systems of different domestic and foreign enterprises (Kononov V.Y., V.E., date of appeal 17.10.2014; I. Pavlovskaya, date of appeal: 10/20/2014; Rabunets P., date of appeal: 12.10.2014; J. Womack and D. Jones, 2005, p.37; J.E. Harbour,, 1981; O. Fiume and J. Cunningham, 2003, p.113; Jacob Stoller, 2015, p.353). The main criteria were revealed by which one can see the differences of "Lean Production" system implementation in Russia and abroad.

Table 2
THE PECULIARITIES OF LEAN PRODUCTION IMPLEMENTATION AT DOMESTIC AND FOREIGN
ENTERPRISES

Criteria	Russian enterprises	Foreign enterprises
The role of leadership	The management rarely pays its attention to the elimination of losses and forgets about a value approach.	(USA, Japan, etc.) Management promotes actively the system and participates in the implementation, as corporate strategy of permanent cost reduction is in the rank of the philosophy of life of all enterprise employees.
manufacturing system implementation	Approximately one-unity of Russian companies have the experience of lean manufacturing implementation, exhausted in most cases by the use of one or two instruments. Most enterprises make "photocopies" of foreign techniques.	aimed at strategic goal achievement.
	Western approach (Lean Production). Western approach is focused on getting fast business results and implemented according to "top - down" principle. The implementation is carried out by a management team who takes all decisions on the production and organization of work at each site, determine the requirements and formulate rules, create regulations for the implementation of value stream. All employees (ordinary workers) must comply with these regulations strictly. Practically they introduce few things in them.	The Eastern approach (Japanese- TPS) is primarily involved in the process of all staff, the inclusion of each employee intellect in the rational organization of his working space, and then the production process. Of course, this method of implementation is slower. At first, it requires enormous efforts to overcome the inertia and the disbelief of workers, the learning of lean manufacturing basics. But in the end it provides higher and more consistent results, and then it allows implementing full-length projects of lean manufacturing easier and more effectively.
Time spent by staff on activity improvement	Top management, middle managers - 10%, Foremen - 5%, Operators - 0%	Top management, middle managers - 60% Foremen - 20% Operators 15%.
Motivation system at lean manufacturing implementation	Based solely on the cash reward for any proposal, a written instruction, etc. The heads of enterprises punish the guilty ones in any problem. This leads to the fact that employees hide mistakes and drive them deep into the sources of problems.	The presentation of awards based on the performance of individual work plan established by the company management. Leaders try to correct errors, in their turn, without the punishment of workers, but rather encouraging for the identified problems and improvement suggestions.
The developers of lean manufacturing system at an enterprise	Often the project of lean production system introduction is implemented by the man who does not have sufficient theoretical and practical skills.	The management of companies performs a serious recruitment of specialists in the working groups on the implementation of lean manufacturing system.

The attitudes for standards, procedures, instructions	The formal attitude of employees to any methods, standards, regulations, developed in the course of lean production system implementation.	Any standard, technique, guideline is developed together with the workers and is adapted to a specific enterprise activity during the implementation of lean manufacturing.
The scale of enterprises, implementing lean manufacturing	Approximately 30% i.e. the companies which have to compete seriously with foreign and domestic manufacturers and companies with foreign capital.	In the United States, Japan and other developed countries more than 80% of companies regularly use the tools of lean production in their activities.
The degree of information openness of information about the results of lean manufacturing implementation	They do not disclose figures, they consider that lean technologies are an internal resource, which is able to develop Russian economy and make it competitive on a global scale.	They tell rather openly what they do and what results they achieve.

CONCLUSIONS

In most cases, Russian companies use a specific set of ready-made tools for lean manufacturing. This choice depends on the scope of an organization, its life cycle and financial condition development; a company needs (tasks), a technological process, an economic situation in a country, as well as on the problems faced by an enterprise (a company). The selection of lean production necessary tools and not the creation of ideology and the corporate culture of lean production is the basic approach of the Russian enterprises today for performance improvement.

Despite the lag of Russian enterprises as compared to foreign ones at the implementation of lean production system, the study showed that they have the development reserve. It is assumed that they may overcome an existing gap, rather than relying on ready-made methods of "Toyota" company or other foreign companies. Russian industry needs to develop its own path through the analysis of all the errors; the consideration of Russian people mentality; the specifics of the domestic industrial production, which is focused on certain stocks of raw materials, components and materials; the consideration of the ambiguous relationship between the suppliers and the manufacturers; the consideration of Russian consumer tastes and preferences.

SUMMARY

The analysis of national experience in the implementation of lean manufacturing at machine-building enterprises showed that the problems are scientific and methodological ones. Enterprises study the foreign experience in this area and try to apply it in its practice by the method of trials and errors. Thus, not all expectations are met. The experience of "Lean production" concept application cannot be used in domestic practice using a template principle. The lag of the Russian enterprises in the implementation of lean manufacturing techniques with a gap can be overcome by an essentially qualitative way, reaching a significant abrupt systemic effect. This is the only qualitative way to create a corporate culture and an ideology, its new instruments, based on the principles of lean production, contributing to cost savings, the production optimization concerning a desired product in terms of Russian realities and facilitating the transition to a qualitatively new trajectory of a domestic enterprise development.
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TOPICAL ISSUES OF INFLUENCE OF "CONTRACTION REENGINEERING" ON STRUCTURE OF BUSINESS MANAGEMENT

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ABSTRACT

Introduction: This paper is devoted to actual problems of the influence of "contraction reengineering" on enterprises management structure in modern changing environment conditions. The question is a radical rethinking of the existing business management structure and revealing of the competitive potential for existing management structure of enterprises in the conditions of transformation and uncertainty.

Methods: In the study we have used methods of financial and economic analysis, a wide range of methodologies of strategic management and financial management, some methods of innovation management, methods of strategy management diagnosis, and innovative methods of business reengineering.

Results: "Contraction reengineering" tools are presented in terms of innovative development of the enterprise as the necessary condition for quality transformation. The authors have revealed the main directions of evaluation of changes and risk reduction, justified the choice of the growth rate of enterprise development, and considered an enterprise reengineering management model.

Discussion: The paper analyses the approach of M. Hammer that had been developed in the early 90s of XX century and resulted in a broad scientific discussion and that is relevant to the present. The approach of modern Russian scientists on the business process management problem is considered in detail. The authors share the opinion of the economist I.T. Balabanov in matters of dynamics of engineering business processes. We have studied the definitions of engineering, reengineering, introduced the author's definition of "contraction" engineering, and "expansion" engineering.

Final Report: Some conclusions formulated can be used in enterprise management to select the most effective methods in terms of the implementation of the key success factors.

Key Words: "Contraction Reengineering", Reengineering Of Business Processes, Industrial Engineering, Development Management, Competitiveness, Innovation Enterprise, Cost Management

INTRODUCTION

The aim of the paper is theoretical and methodological study of topical issues on influence of "contraction reengineering" on company management structure. Under present conditions, virtually every enterprise undergoes to a greater or lesser degree a phase of the up-to-date need in reengineering as a radical re-evaluation of its competitive advantages. This phase

will be marked by us as a "contraction reengineering", i.e. a process aimed at revealing viable, cost-creating mechanisms which perfectly meet the requirements of the legislation. As practice shows, the consequence of this trend is the restructuring of all activities, involving the previously unused resources in order to survive, preserving market position or further sustainable development taking into account the changing environment. As a result of the "contraction reengineering", consequences of external and internal turbulent factors impact (Bagautdinova N.G., Safiullin L.N., 2014, p.55) are harmonized that allows the company not only to survive but also to develop.

In the ideal econometric model, the development of a company, its financial and economic efficiency with all the positive externalities tends to infinity. This is possible in the conditions of stable external and internal environments, the balance of constant and variable factors, and stagnation of changes that is realizable only in the theoretical model (Shigabieva A.M., Safiullin L.N., Mazitov V.M., Saipullaev U.A., 2014, p.388-391). Up-to-dating of "contraction reengineering" is a signal that it comes a restrictive phase in this direction of the development, or "contraction phase". The contraction phase replaces the "expansion phase" of processes deployment and their in-depth introduction, with errors and permissible admissions. On this basis, we should recognize that for any definition of the development process it always has a limit. And the most proven and effective methods of management and development are replaced by innovative, "breakthrough" ways which in the period of adaptation may be evaluated even as provocative to some extent. (A.I. Podgornaya, S.I. Grudina, S.G. Avdonina, 2015, p.519) As approaching the "contraction" phase, to the limit, revenues and sales fall, costs rise, the impact of competition increases. During this period, the "contraction reengineering" is relevant when one competitor approaches to the limit of its development, and other competitors explore alternative processes with a higher limit on the basis of previous experience and the integration of new knowledge.

METHODS

We have used methods of financial and economic analysis, methods of strategic management, innovation management methods, methods of management diagnostics, methods of business reengineering as a tools. We used scientific methods such as analysis and synthesis, systematic approach to the study of the external and internal environments of enterprises, socioeconomic phenomena and processes, as well as methods of forming generalized criteria and operating rates for enterprises of various spheres of activity.

RESULTS AND DISCUSSION

Let's consider theoretical preconditions of origin of reengineering. Category "Engineering" has originated from the term close to "technics", "technical art" and may take in some cases the meaning of the word "design". "The business engineering should be understood as the system of methods and techniques used to create a business that meets the goals set by the organization". The studied category may include a number of components. For example procedures for re-engineering of business processes, ratio analysis which allows measuring the effectiveness of investments in the facility and its profitability, as well as innovative style in the process design. In general terms, reengineering expresses restructuring or reorganization of the enterprise on stream (Kabaale, E., Kituyi, G.M., 2015, p.80). Terminology of reengineering was

introduced into scientific use by the American scientist M. Hammer in the early 90-ies of XX century. It should be noted that Russian scientists define the term slightly differently: "Business reengineering is a fundamental change in the existing management structure and production of a company based, as well as in engineering, on the interaction of the selected processes". Therefore, the concept of re-engineering is derived from engineering processes and expresses designing or replacement of the current management and production structure of the company and its business as a whole. I.T. Balabanov considered engineering "as a certain form of exports of services (transfer of knowledge, technology and experience) from the country of origin to the country of the customer". It was theorized that re-engineering contains complex innovative researches for preparation of a feasibility study, a broad set of project documents as well as the development of recommendations on organization of production and management, equipment operation and sales of finished products to an end user (Nadarajah, D., Kadir, 2015, p. 522-53).

For further analysis let's identify six quality characteristics of engineering:

- 1. By the form of delivery, it is a service to enterprises operating in the sphere of material production rendered on a commercial basis;
- 2. By its content, it is a wide range of services related to the implementation of a project including the phase of improving the business process;
- 3. By its objectives, it is bringing high-tech research development to the production stage;
- 4. By its sectoral focus, it concerns industry, construction, agriculture, etc.
- 5. By the form of performance, it is "contraction"engineering
- 6. By the area of implementation, it is "expansion" engineering

Based on the above structure we can formulate a feature of re-engineering as a service. It lies within the principles of urgency, availability at a fee, and availability of innovative and technological component of a process. It is based on a set of services for the design, construction, acquisition, commissioning and trial operation of the facilities. The purpose may vary depending on the technology and the riskiness of the project. Activities of engineering (reengineering) companies are an important factor in the implementation of advanced scientific achievements. Such spectral scope of developmental reengineering modulations aimed at expanding involves time length and recurrence of implementation and also heterogeneity of the project execution structure requiring qualitative control and organization. (Cherukupalli, P., 2015, p. 40) For the purposes of research we differentiate the recurrence stages implemented in engineering: project definition stage (high technology research), project development, post-project stage, recommendations.

Table 1 DESCRIPTION OF THE COMPLETE CYCLE OF ENGINEERING SERVICES IN ACCORDANCE WITH QUALITATIVE ORIENTATION OF THE STAGE

Nº	Engineering stage	Description of the engineering cycle stage	Qualitative orientation of the stage
1.	Project definition stage (high technology research)	Preliminary study of marketing feasibility of the project, the technical possibility of its implementation	Expansion
2.	Project development	Preparation of project documentation, general layouts, schemes, working drawings, etc.	Contraction
3.	Post-project stage	Preparation of orders on supplying equipment, engineering and construction works, supervision of equipment manufacturing and the progress of civil and erection works	Expansion
4.	Recommendations	Recommendation services for operation of the facility after its commissioning and sale of finished products.	Contraction

It is clear from Table 1 that consulting component of engineering is not its characteristic feature since this type of business services is primarily a way to implement large-scale industrial projects and a method of introduction of scientific and technological achievements into practical activity of enterprises. Broad scientific discussion is caused by debates on the role of engineering firms in the social reproduction of high-tech innovative products. We share the view that the companies of this spectrum of services can initiate activities on many projects for the implementation of technological programs and processes (A. Podgornaya, S.Grudina, 2015, p.1074). In addition to the above-mentioned, the efficiency of this kind of companies and organizations is a key factor in the introduction of innovative technologies in the social production.

 Table 2

 COMPARATIVE CHARACTERISTICS OF DIRECT AND REVERSE ENGINEERING

Direct engineering (extension)	Reverse engineering (contraction)
Development of models of new business	A study of existing business processes:
processes:	• Formulation of business process engineering tasks, as the project
• An ideal model which can be achieved in the	develops, is coordinated in accordance with the changing external
long term and to which it is necessary to be	environment.
aimed.	• Initially formulated targets can be adjusted according to a study
• A real model which can be achieved in the	of the existing business processes organization system.
long term taking into account availability of	• concepts of business processes are constructed allowing to
resources.	understand the essence of the business process as a whole and to
	identify areas of reorganization

So, the result of the transformation of the forms and directions of engineering into the required factor of production was the allocation in a separate kind of business of specific services of scientific and technical nature aimed at bringing the scientific achievements to production factors. Statistics show that the demand for services of engineering firms grows, the number of companies of this kind increase, and the competition between them becomes tougher. (Radosevic, M., Pasula, M., Berber, N., Nebojsa, N., Nerandzic, B., 2015, p. 71). A similar trend is observed in Russia. Practice shows that innovative and large firms in the process of industrial

production "expansion", it is more effective for many companies to engage engineering firms rather than to risk the valuable resources, to spend time and money on staff development.

The changes which have been developed in the environment directly affect the relevance and effectiveness of application of an organizational structure.

There has been stated a trend on transition from a vertical hierarchy to horizontal integration enhanced by matrix and project management structures. This is especially relevant for innovative enterprises, enterprises with a flexible development strategy (An, J.-W., Zhang, Z.-Q., 2015, p. 1611). A timely transition to the most effective structure of enterprise management largely determines its success and viability.

Objectification of changes related to business process reengineering and management structure are presented in Table 3.

Table 3
THE PRINCIPLES OF BUSINESS MANAGEMENT IN THE EVENTS OF "EXPANSION" AND
"CONTRACTION" RE-ENGINEERING

Management principle ''Expansion reengineer		"Contraction reengineering"	
Access to information is restricted.	Distributed databases. Free access to information.	Information may appear simultaneously in those places where it is needed.	
The choice between centralization and decentralization.	The use of telecommunication networksThe ability to take advantage situa both centralization and decentral		
The work is done in the office.	Wireless connectivity and performance of work "at home".	Employees can send and receive information from the place where they are.	
The need for face to face meetings to resolve issues.	Interactive video access, Teleconferences. Better, more effective contact with buyer.		
Only experts can perform complex work	Creating and using expert systems.	The experts work can be performed by an expert on general issues. Improvement of skills of employees.	
All decisions are made by chiefs.	Use of decision support systems (Access to databases and data repositories, analysis and modeling tools).	Decision-making becomes a part of work of each employee. The growth of the responsibility of every employee.	
The need to keep track of the object.Barcoding is carried out automatically.		The objects inform promptly about their whereabouts on their own.	

Let's consider the innovative approach to building a system of aggregated models for decision-making in reengineering management (Rrezaie, K., Ostadi, B., Samadi, H., Mohammadi, M., Nazari-Shirkouhi, S., 2015, p. 61). It is grounded on an open base model of the organization life and the model of the intermediate developing enterprise state with a change correction mechanism providing the enterprise re-engineering by its adapting to the most likely changeable environment in the course of planned reforms. Upon that, the basic model is transformed with a smaller number of variables or constraints.

The generalized model of change management in the course of enterprise reengineering represents the requirements of the system and financial analysis theory to this process, outlines business dimensions to provide managers with tools allowing to consider changes in the process of reengineering in the enterprise within the frameworks of a single process taking into account the state of the external environment of the enterprise, and with a focus on the relationships, interdependences and interaction of the various aspects of its operation in this environment (Annamalai, C., Ramayah, T., 2015, p. 185).

According to our research, from the point of view of the system theory the enterprise reengineering process can be represented as a transformation of a business process (Hess, T., Schuller, D., 2015, p. 252). Suppose a business process B₁ (which has a certain effect E₁ = {r_{1j}} providing an opportunity of implementation to a number of results r₁₁, r₁₂,..., r_{1j} (R₁ = {r_{1j}}) satisfying to a number of needs n₁₁, n₁₂,..., n_{1j} (N₁ = {n_{1j}}) with a specific quality q₁₁, q₁₂,..., q_{1j} for each realization r_{1j}) in the business process B₂, with the corresponding feature on the effect E₂ (characterized by its set of results and quality requirements). In this case the aggregate assessment of the quality Q_{E1} = {q_{1j}} and Q_{E2} = {q_{2i}} in the implementation of the needs N₁ = {n_{1j}} and N₂ = {n_{2i}} acts as an assessment of the effect (quality) of business processes B₁ and B₂.

In the case where R₁ and R₂ are the same as the potential quality of business processes B $_1$ and B₂ management of the enterprise reengineering can be represented as:

$$B_1: Q_1 \equiv Q_{E1}, E_1 \equiv R_1 \rightarrow B_2: Q_2 \equiv Q_{E2}, E_2 \equiv R_2.$$

It should be noted that upon the enterprise restructuring the new need N $_2 = \{n _{2i}\}$ is the development of aggregate need N $_1 = \{n \ 1j\}$ from where it follows that N $_1$ and N $_2$ are subsets of some universal set N determining the status of this species of needs.

RESULTS

This fact allows the following conclusions to generate for building a number of aggregated models of business processes reengineering at enterprises:

- 1. An existing business process B_1 , its elements, links and structure should be used in the capacity of a mean for building the business process B_2 (a new enterprise in the process of its re-engineering) for the implementation of the need N₂.
- 2. During creation of a new business process (B_2) it is required to review the composition and reform virtually every element and the business process B_1 in the evaluation of their usefulness in the new business process (B_2) in view of involvement of new components in the business process B_2 (being not elements of B_1) and placing them in the appropriate relationship with other elements and processes of the business process B2.
- 3. As a result of changes in the business process B₁ there is formed an intermediate developed business process B₁₂, constant monitoring of which (at the level of experimental functional quality evaluation Q₁₂ by separate implementations R₂ and and also a complete quality assessment Q₂) makes it possible to assess the adequacy of conducted transformation of the enterprise in terms of its transfer to a new level of functioning.

The specified factors cause emergence of engineering services as a special market product and determine their further development (Ryashchenko, V.P., 2015, p. 143).

Engineering market is a specific market segment of innovations. In this market not a tangible product is sold, and the individual (not having analogues at the time of conclusion of the

contract) service which performance is associated with high technical risk. Therefore, the customer acquires the right to use scientific and technological potential of the developer (engineering company) and its sub-contractors only with pay for the end result. (Ryashchenko, V.P., 2015, p. 125) Re-engineering and business engineering both for the "expansion" phase, and for the "contraction" phase are a complementary spectrum of models what can be characterized as the rationalization of business algorithms reproducing costs.

CONCLUSIONS

Based on the above-mentioned, it is relevant to separate the two phases of reengineering: "expansion reengineering" and "contraction reengineering". M. Hammer and J. Ciampi, the founders of business process reengineering, underlined an unconditional need to conduct engineering of companies in the case of the influence of separate and cumulative actions of the so-called three "C" (Customers, Competition, Changes), which influence formation of new external environment and make increasingly clear that the companies started to operate in an initial environment, cannot effectively work in another, substantially changed external environment (Leshchuk, V., Polinkevych, O., Ishchuk, L., 2015, p. 57). In our opinion, the problem should be solved using the target management tools in the case of "contraction reengineering" and "expansion reengineering" and differentiation of factors on impact to the planned processes.

SUMMARY

Thus, innovative activity in the industry and other basic sectors of the economy is no longer conceived without the participation of specialized engineering companies. We also note that upon the implementation of technically sophisticated, multi-level projects, engineering firms perform dominant mission not only as guides of the achievements of scientific research, but also as managing and coordinating centers systematically integrating the work of all participants and ensuring the achievement of quantitative and qualitative parameters of growth what is reflected positively in the growth of the company's value.

In the case of application of "contraction reengineering" in enterprise management new business processes model must be such as to be able in the future to move to the ideal model. Thus, the "contraction re-engineering" on the basis of modeling of business processes allows the most effective options to select in terms of the implementation of the key success factors and to use them in business management.

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THE FORMATION OF ORGANIZATION FLEXIBLE DEVELOPMENT STRATEGY

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ABSTRACT

Many problems faced by modern Russian organizations, may be reduced to the largest ones, one of them is the ability to respond flexibly and cost-effectively respond to market conditions. The need for a flexible strategy development is primarily associated with ongoing significant changes in terms of macroeconomic indicators, the state regulation systems for market processes, financial market conditions and the associated uncertainty.

The purpose of this article is to analyze the possibility of a strategy formation for the flexible development of Russian organizations.

During the study performance the statistical methods, the methods of strategic management, economic analysis of organization activity, as well as such scientific methods as analysis and synthesis, the systematic approach to the study of the external and the internal environment, socio-economic phenomena and processes as the set of tools.

The study revealed the need for organization management strategy change, the method of organization flexibility evaluation was developed, and the offer of flexible development strategy implementation strategy was substantiated through the development of fractal organizations.

The methods of an organization flexibility evaluation and separately formulated conclusions can be used during the development and the implementation of a flexible development strategy for large and small organizations, state agencies and non-governmental organizations.

Key Words: *Flexible Management, Development Strategy, Crisis Management, Fractal Organization, The Anti-Crisis Immunity*

INTRODUCTION

The relevance of the work is conditioned by the need to develop crisis management technologies in order to overcome the problems of management within the conditions of uncertainty and systemic crisis associated with the establishment of a new stage of the market economy development. Considering the publication statistics about bankruptcy posts during 2014-2016, 6773 publications were published on April 2014, 6631 publications were published on April 2015, 9859 publications were published on April 2016 (Bankruptcy message statistics from the newspaper "Kommersant", date of the application April 2016). Despite the fact that a great attention is paid to strategic management nowadays, a number of relevant issues on the formation of anti-crisis potential of organizations remains, including the issues on the formation of the development strategy. A strategy selection problem is often underestimated, which leads

to the need for preventive measures. The purpose of this article is to analyze the possibilities of a flexible strategy development for Russian organizations.

Many problems faced by modern Russian organizations, may be reduced to the largest ones, one of them is the ability to respond to market conditions flexibly and cost-effectively. Moreover, the adjustment of development strategy is relevant not only for large but also for small companies, government agencies and non-governmental organizations. The need for a flexible strategy development is primarily associated with ongoing significant changes within macroeconomic indicators, the state regulation systems for market processes, financial market conditions and the associated uncertainty. However, changing market conditions bring a number of advantages for promptly adapting organizations. Their management is based, for example, on a flexible development strategy. In order to make all these advantages be used by an organization, it must be adapted to the conditions of these benefits obtaining. In order to solve this problem it is necessary to develop a common methodology for a strategy formation, which was based on the principle of the technical, financial and economic situation improvement provision. This strategy consists of a series of successive events with feedback which allows the adjustment of goals, objectives, and also the development of the resulting indicators concerning the economic condition of the entire organization.

METHODS

During the study performance the statistical methods, the methods of strategic management, economic analysis of organization activity, as well as such scientific methods as analysis and synthesis, the systematic approach to the study of the external and the internal environment, socio-economic phenomena and processes as the set of tools.

RESULTS

The study identified the stages of an organization flexible development strategy, the methods of an organization flexibility degree evaluation were developed, and the proposal of flexible development strategy is substantiated through the formation of fractal organization.

The first step towards the establishment of a flexible development strategy is the strategic analysis of the company. It includes a SWOT-analysis, scenario analysis, SNW-analysis, the analysis of financial ratios, the comparative financial analysis, an expert analysis, the comprehensive evaluation of an institution strategic financial position.

The next step is the formation and coordination of strategic objectives. The quantitative indicators of the economic complex condition and the implementation of measures for a new structure creation are developed during the third stage. It is necessary to introduce such a concept as "flexibility" to make a substantiated decision on quantitative indicators. Flexibility is the prerequisite to improve organization operation efficiency.

By flexibility we mean the process of a purposeful change of parameters, the structure and the properties of an organization in response to the changes within external and internal environment. The flexibility in economic context is the changes performed by an organization in order to adapt to new economic conditions and activity purposes (A. Podgornaya, S. Grudina, 2015, p. 1074). From an economic point of view, flexibility reflects the ability of an enterprise to the development of new quality products within the shortest possible period, within lower costs and within a new economic system. The degree of flexibility may be determined by focusing on the following factors:

- 1. The relevance of a manufactured product;
- 2. The competitiveness of a product;
- 3. The adequacy of the scientific and technical base and the level of staff qualification;
- 4. Financial liquidity level

There is the issue of different readiness for the transition to a flexible development strategy of individual units for large organizations with several departments during the formation of a flexible development strategy.

The flexibility of a large organization is the ability of all units to receive a synergistic result for a certain period from the sale of products demanded by market, which provides a long-term development of the departments.

The degree of flexibility during the implementation of the strategy can be defined as follows:

Profit change ratio at strategy change (Pr_f) :

Pr – the profit planned by management

 Pr_1 - the income from old products

 Pr_2 - new product income

$$Pr_f = \frac{Pr}{Pr_1} + Pr_2$$

The coefficient of the product amount of change during the development of Q_f :

Q - the quantity of product planned by management

 Q_1 - the amount of old products

 Q_2 - the amount of new products

$$Q_f = \frac{Q}{Q_1 + Q_2}$$

The ratio of own asset change (A_f) :

A- own assets of an organization

 A_1 - own assets of management

 A_2 - own assets of department

$$A_f = \frac{A}{A_1 + A_2}$$

Flexibility degree (F_1):

$$F_1 = \frac{Pr_f}{A_f + Q_f}$$

The component of large organization flexibility, the level of corporation, characterizing its ability for development will be defined as (F_b) :

 Pro_i - an average profit for an update from the i-th large organization per 1 developed product

 C_i – average expenses of i-th large organization for the update of one developed product included in the cost

 A_i – own assets of the i-th large organization

 q_i - the number of business units in an organization

 Q_i - a natural number of product in development of the i-th unit

$$F_b = \frac{\sum_{q_i}^{i=1} (Pro_i + C_i) \times Q_i}{\sum_{q_i}^{i=1} A_i}$$

Thus, the flexibility of a large organization may be represented as the total costs of its business units, accounting for the ruble of own assets. The assessment of an organization stability for modernization, involves the determination of flexibility characteristics concerning each element of a considered organization.

Table 1 shows the comparison of development strategy based on planned indicators and an organization flexible development.

Table 1
FUNDAMENTAL DIFFERENCES IN THE DEVELOPMENT STRATEGY INTERPRETATION

Comparison indicator	The development strategy as the system of planned indicators	Flexible development strategy as an integrated system	
Accounting object	Costs, quantitative	All object data is needed to	
Accounting object	indicators	make right management decisions	
Solution type	Operational solutions	The decisions of operational	
Solution type	Operational solutions	and strategic nature	
	Decisions concerning the	The decisions on organization	
Decision scale	management of individual	management as a whole and its structural	
	organization units	divisions	

One embodiment variant for a flexible implementation strategy is the creation of a fractal organization. Fractal is an object whose complexity does not depend on its size. It is always similar to itself; it retains the ability to reproduction. If deterministic systems are entirely dependent on external factors, the fractal is independent one (A.I. Podgornaya, S.I. Grudina, S.G. Avdonina, 2015, p. 519). Thus, a fractal organization is a highly adaptive organizational structure which can change the structure within the shortest periods of time.

In this context the introduction of a flexible development strategy can serve as anti-crisis potential for an organization. Under the anti-crisis potential we mean the possibility of an organization to adapt and the ability to predict the response to the random effects of economic factors, when even threatening accidents are turned into opportunities.

A fractal organization logically raises the issue of a rigid mechanistic structure maintaining for an organization or the development of an authoritarian model of management in the conditions of uncertainty due to its complexity, risk and instability in many components. There is an opinion that the rigid structures based on management formalization are stable ones. However, we know many examples of the post-Soviet organization destruction with complex traceable destruction origin and the rapid unavoidable crisis of the system.

The introduction of a flexible development strategy through the formation of fractal organizations is conditioned by many factors. And one of the important factors of such a potential is the solution of the problem concerning the formation of modern economic and "innovative" thinking. Fractal organizations are in constant development as systems. They are subject to positive changes, because the adaptation which accompanies an organization within the terms of uncertainty throughout the life cycle facilitates the disclosure of innovative and anticrisis potentials.

Let's consider the stages of flexible development strategy implementation through a fractal organization formation.

Stages of new organization system development	Manageable processes	Additional cost/investment rate	
An organization works stable, changes tend to zero.	More investments is necessary for the preservation of competitiveness former rate. The conditions for changes are developed.	Additional costs grow, but they are not maximal.	
Start of changes, the emergence of resistance in an organization.	The opposition of old and new directives in an organization.	Costs are maximum and targeted; the methods of pressure are used on several fronts simultaneously.	
Irreversible changes.	The development of a new organization, the solution of current problems.	Minimal additional costs, the management at the level of subtle signals	
The emergence of a new system.	The support of new parameters, change management.	Average-variable costs, excluding force majeure cases.	

 Table 2

 FRACTAL ORGANIZATION DEVELOPMENT

The next possible step for an organization is the experimental introduction of a fractal relation system. The development of a plan and an integrated system with specific results, a certain organizational structure, run and adjustment of a new structure with the minimum resource provision and the maximum ability of resource creation for new projects. In this structure one may single out three equal and equivalent control channels: a hierarchical, a horizontal, and an anti-crisis one. Each person occupies a certain hierarchical level in a fractal structure, and interacts with the others on an equal basis, i.e. a two-dimensional, hierarchical principle of development.

DISCUSSION

Interdisciplinary studies allow managers to get an answer to the question of crisis management causes by examining the mechanics and dynamics of destruction. Under the destruction we mean a complex process of internal restructuring with the break of internal relations under load (Adizes I.K., 2008, p. 43). In order to be able to predict destructions, to prevent such situations, to form an anti-crisis potential let's take a look at the study from new science and destruction mechanics perspective. Nowadays, there is no similar trend in the management of organizations, although these laws act on the organizational structures. Initially a linear destruction mechanics takes place. This is rather point and small destruction, which occurs without the external deformations of a system structure. Therefore, it is quite difficult to predict the scale of organization destruction with a rigid structure. Further research shows that such destructions are extremely rare. In most cases, destruction makes an influence on a structure appearance change, so-called ductile destruction or plastic deformation. It is observed in plastic structures. Deformation may split a structure into two parts, for example. Failure occurs in the process of nucleation, fusion and distribution of internal particles. In management it is comparable with the internal exhaustion of staff, which gradually loses senses, personal relevance and demonstrates care, not intending to leave an organization and consuming its resources. A ductile destruction is more visible and manageable, therefore it is less dangerous. In this case, there is no apparent need to change an organization management strategy. It is enough to take well-known crisis management measures. The "fractures" with a fractal branching structure were studied in the destruction mechanics and description and the form of linear destruction mechanics are not applicable here. In this case, the elements of the employee irrational behavior on the general background will be fractal here and thus the linear and nonlinear system destruction takes place. In our opinion, the nonlinear destruction mechanics describes the processes of destruction most adequately. It studied the properties and behavior of fractal structures also in combination with synergy, studying the processes of complex system evolution and self-organization. An interdisciplinary approach became possible due to synergy. The law of balance is observed in nature. Material destruction mechanisms are predetermined in the process of their development. These are the errors on the phase of an idea or an initial stage of the life cycle for an organization.

The magnitude and multiplicity of destruction and creation, their diversity for an organization makes the destruction identification difficult at the early stages or develops a special circle of managers (often from the circle of top managers), who are not involved in destruction. However, these levels are subject to destruction faster than others. They give rise to administrative errors leading an organization with a rigid structure to a complete destruction. Besides, rigid structures are loosened by chaotic turbulence-micro changes give rise to macro destructions bringing to the inability of survival within the terms of uncertainty and chaos. The innovative development factors of Russian enterprises were studied by such Russian scientists as Bagautdinova N.G., Galieva G.T., Safiullina A.M. and A.N. Melnik, (Bagautdinova N.G., Galieva G.T., Pakhmutov Ya.O., Pratchenko O.V., 2014, p.75; Safiullina, A.M., Odintsova, J.L., Zhilina, N.N.,Shamsutdinova, M.R., 2014, p. 197; Melnik A.N., Lukishina L.V., Sadriev A.R., 2015, p.40991) who substantiate the need of management change and the implementation of new strategies in their works. For example, D. Pink provides many examples when the achievements become possible when managers deviate from customary practices and implement new approaches to motivation, which correspond to the concepts of modern science. In Google

Company employees are allowed to be involved into personal projects one day a week, and at Best Buy employees are allowed to work wherever and however they want, as long as they reach their goals (Pink D. Drayf, 2012, p. 34). Practice showed that crisis may be overcome much easier by the organizations in which some anti-crisis activity was conducted (Filonovich S.R., 2010, p. 76). A flexible organization, which prevented or overcome a crisis has a great courage and responsiveness to the demands of a changing environment, thus winning the next competitive advantages. The competitive advantages of the organizations which implemented the strategy of flexible development are also in the correct choice of tactics, varying depending on the signals sent by an external environment.

CONCLUSIONS

The performed statistical study of Russian companies revealed the need for the changes in the management strategy and the introduction of a flexible development strategy. The developed evaluation method of an organization flexibility degree allows quantifying an organization response to changes, and subsequently developing the suitable flexible methods of management. The obtained values can be used to develop and implement a flexible development strategy for large and small organizations, government agencies and non-governmental organizations. One form of the flexible development strategy is the development of fractal organizations.

SUMMARY

Extrapolating trends let's distinguish two groups of organizations. The basic classification criterion is an organization ability to react to external environment changes. Let's describe inert, unchangeable and open systems. Inert systems include plants operating with a minimum of staff. Public organizations may be characterized as flexible ones, that is, the ones which evolve and change, producing a so-called anti-crisis immunity. The external and internal environments of flexible and mechanical organizations differ greatly. In our opinion, the main objective within these conditions is the timely introduction of a flexible development strategy. Often this implies the development potential of an organization, which does not guarantee the formation of an anticrisis immunity which enhances crisis stability and mitigates the devastating effects of systemic and local crises. The synergistic effect of the innovation potential (provided by flexible development strategy) and the anti-crisis immunity provides an effective transition to the new level of an organization development, corresponding to the life cycle stage.

This article used the experience of previous researchers (Alla Podgornaya, Svetlana Grudina, Sofiya Avdonina, 2015, p. 275; Safina D.M., Podgornaya A.I., 2014, p. 187; Bovin A.A., Cherednikova L.E., Yakimovich V.A., 2009, p. 29; Kirshin I.A., Maleev M.V., Pachkova O.V., 2014, p. 320; Angappa Gunasekaran, Rameshwar Dubey, Surya Prakash Singh, 2016, p. 1), but the proposal to introduce a flexible development strategy through organizational change, moving to the creation of a fractal organization is an absolutely new one. The consequence of this proposal implementation will be the transition to a qualitatively new level of an organization development and the obtaining of synergy and economy effect from flexible interaction between employees during the process of operation.

Thus, the organizations implementing the flexible development strategy has all the prerequisites for the development and the strengthening of the anti-crisis immunity at the synchronization of its development various components.

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TRADE NETWORK'S PRODUCT RANGE MANAGEMENT

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ABSTRACT

The main task of the organization of retail trade network is to create the widest possible range of products, so that customers could buy all the goods they need in one store. At the same time, a reasonable product policy optimizes the range based on customer value, range renewal rate that takes into account the product life cycle stage, the optimal ratio of new and existing products sales, the optimal range renewal rate, the withdrawal of products losing popularity from the range. From the standpoint of the seller's interests, a reasonable trade policy reduces inventory levels, accelerates the turnover of current assets, increases turnover and improves profitability of the trade network.

Key Words: Market Research; Turnover; Product Range; Product Life Cycle, Portfolio Analysis

INTRODUCTION

Product range management, being one of the functions of marketing, is intended to ensure the products' competitiveness, the development and introduction of new products, the optimization of the ratio of product groups at various stages of the life cycle, specifying the location of the goods in the sales area as well as the method of merchandise display, shelves' design. "In order to achieve competitive advantages, most companies invest in advertising and brand development, diversification, including through the introduction of products under its own brand name..." (Nazarov, 2010).

The product is the basis of the marketing mix, since it meets the real needs and requirements of the person, and marketing contributes to identifying and meeting them better than the competition. Therefore, the main task of a retail trade network is to create the widest possible range of products, to gain the target audience's loyalty and attract new customers. Providing a speedy service, convenience of product selection, design of sales area, managing the delivery, storage, sale preparation and sales, market research, promotional activities are among the goals that a retail trade network needs to meet.

Administrative decisions on product lines are often based on the traditional structure of the range, on intuition, which leads to instability of the produce range structure, a loss of control over the commercial network's competitiveness, an unreasonable level of inventory, slow turnover of working capital and reduction of profitability. At the same time, a reasonable product policy provides:

- 1. Product range optimization based on customer value;
- 2. Rate of the range renewal accounting for the stage of product life cycle;
- 3. Optimal ratio of sales of new and existing products;
- 4. Optimal rate of the range renewal;
- 5. Withdrawal of products losing popularity from the range.

LITERATURE REVIEW AND HYPOTHESES

To maximize customer satisfaction, the trade network should have a wide range, so that everything could be purchased in one store. According to Muromkina (2001), when choosing a store "first of all, such parameter as the range offered to the customers was taken into account..."

Sandrakova and Stratienko (2012) state that "assessment of a retail network's range is one of the operational objectives, the solution of which guarantees optimization and streamlining of the product range, reasonable product and price offers in the market of retail operators in an aggressive competitive environment and, eventually solves a strategic task of the effective management of material and financial flows of the retail network."

Cheremisinov rightly argues that, as a rule, lack of stock of required range is the external cause of unsatisfied demand in the wholesale companies (Cheremisinov, 2004).

At the same time, the width of a commercial enterprise's product range generates issues that Nikishkin and Tverdokhlebova (2012) point out: "A deep range of products offered by many commercial enterprises forces customers to make an advanced selection, to compare, to make a decision. And very often the consumer just does not want to think about it, especially when it comes to everyday goods." It is obvious that this problem should be solved by means of merchandising, but not by reducing the range.

According to Fazlzadeh, Sahebalzamani, and Sarabi (2012), assortment variety and additional services, within other customer service and convenience factors, have a positive effect on the customer satisfaction at both supermarkets and hypermarkets.

Based on the above, the role of grounded managerial decision, and therefore, the need for methodological basis of product range management, becomes evident.

RESEARCH GOAL

The goal of the research is to develop a methodology for the product range management and test it on a distribution network's data, as well as to identify the product groups for the implementation of a joint project with the producer. A joint project with the manufacturer allows to formalize requirements for the quality of its products and its composition in the delivery contract as well as to check compliance with the agreed terms of products supplied.

The result of the current research allows streamlining the range according to consumers' and producers' preferences to orient the manufacturers towards the desired level of product quality. This approach provides assortment optimization based on customer value, range renewal rate accounting for the stage of product life cycle, the optimal ratio of sales of new and existing products, the optimal rate of range renewal, withdrawal of the products losing popularity from the range.

RESEARCH METHODS

Techniques based on secondary information about the volume of sales of products: summary, grouping, calculating shares of SKUs, ABC analysis, ranking, product life cycle analysis and portfolio analysis were used as a product range management tool.

Summary - a set of sequential steps in the initial processing of the data in order to identify common features and regularities inherent in the dynamics of the studied series.

Grouping - a method in which the entire target population is divided into groups according to certain essential features.

Calculating SKUs' shares involves determining the proportion of the group's total sales as a percentage.

Ranking is done according to the proportion of the product's total sales in a descending order, starting from the 1st ranking and then the next highest share.

ABC analysis - a method based on the Pareto rule, allowing forming product groups, depending on their importance to the organization. Group A includes the most significant products, group B - significant and promising, group C- irrelevant products.

Combined ranking of products is determined based on the total ranking of the three retail networks. Fragments of the product life cycle are built based on the data in dynamics across the networks over 11 months.

Boston Consulting Group matrix is used as a portfolio approach. The matrix has the following quadrants:

- 1. Stars are the position of the leader in a growing market, it is very attractive, but requires constant marketing efforts to retain or increase the product's market share.
- 2. Question Marks's position is promising, but requires even higher marketing costs to product could become a Star.
- 3. Cash Cows are the position of the leader in the mature market. In this case, the product brings a steady income and does not require significant marketing efforts. This position is the most favorable for the goods and the seller.
- 4. Dogs' situation is hopeless, because the markets are divided, and the goods did not manage to gain a good share. In this situation, it is recommended to leave the market, or to limit the range of products reasonable minimum. This recommendation obviously does not apply to the new goods, those at the Introduction or early growth stages of the life cycle, because at these stages, the position of Dog is quite natural.

The test of the technique was conducted on the three retail chains' data.

ANALYSES AND RESULTS

Since the range of retailers includes thousands of products, product groups on which to conduct the analysis were formed. As a result of the ABC analysis of three retailers' ranges, eight product groups were included in group A, six groups accounted for group B and 14 product groups made up group C (see Table 1).

Stock list	Sales Volume	Ranking	Share, %	Accumulated Share, %	Group
Cakes, muffins, swirls	20916,91	1	11,80	11,80	А
Salads, baking	18948,87	2	10,69	22,50	А
Chocolate	13942,21	3	7,87	30,37	А
Ice-cream	12605,19	4	7,11	37,48	А
Water, drincables	12336,85	5	6,96	44,44	А
Wafers, scones	10804,18	6	6,10	50,54	A

 Table 1

 ABC ANALYSIS RESULTS FOR PRODUCT GROUPS OF RETAIL NETWORK 1

Stock list	Sales Volume	Ranking	Share, %	Accumulated Share, %	Group
Salted fish	9650,10	7	5,45	55,99	Α
Ravioli	9111,15	8	5,14	61,13	А
Household chemicals	7617,12	9	4,30	65,43	В
Coffee	6231,80	10	3,52	68,94	В
Dried fish	5911,89	11	3,34	72,28	В
Sparkling water	5771,71	12	3,26	75,54	В
Candies	5478,25	13	3,09	78,63	В
Bulk stock	5342,22	14	3,01	81,64	В
Chips, breakfast cereal	4176,40	15	2,36	84,00	С
Tee	4108,31	16	2,32	86,32	C
Seeds	3555,25	17	2,01	88,32	С
Beefish preserves	3503,30	18	1,98	90,30	С
Fast soup	3460,83	19	1,95	92,25	С
Nuts	2687,80	20	1,52	93,77	С
Mayonnaise sauce	2482,05	21	1,40	95,17	С
Chicken	2358,70	22	1,33	96,50	С
Canned vegatables	1791,49	23	1,01	97,51	С
Oil, margarine	1720,71	24	0,97	98,49	C
Ketchups, sauces	904,12	25	0,51	99,00	C
Canned milk	621,98	26	0,35	99,35	С
Spices	590,96	27	0,33	99,68	C
Canned fruits	566,35	28	0,32	100,00	С
			100,00		

A similar analysis was conducted on the data from retail networks 2 and 3. The aggregated results are shown in figure 1 and table 2.



Figure 1 RETAIL NETWORKS' PRODUCT GROUP STRUCTURE

	Table 2
AGGREGATED ANALYSIS OF RETAIL	NETWORKS' RANKING (STARTING WITH 1)

		Total	Aggregated			
Stock list	sales network 1	sales network 2	sales network 3	Ranking	Ranking	
Water, drincables	1	1	4	6	1	
Bulk stock	5	3	1	9	2	
Ketchups, sauces	9	2	2	13	3	
Tee	6	4	7	17	5	
Coffee	4	5	5	14	4	
Chocolate	2	6	6	14	4	
Chips, breacfast cereal, dried fish	3	7	8	18	6	
Beefish preserves	7	8	3	18	6	
Canned vegatables	8	9	9	26	7	

Based on the analysis of rankings and ABC analysis, the following products were selected for the joint project: water, drinkables (group A), bulk stock (group B), beefish preserves and canned vegetables (group C).

The study of life cycles of these products (see Figure 2) revealed the main trends in sales:

- 1. The water beverages groups exhibited seasonality, which peaks in the spring summer months and is likely to depend on the weather. The general trend is growth due to the increase in consumption of bottled water.
- 2. Bulk products sales are unstable, but it is impossible to establish a clear seasonality, at the same time there is a clear trend towards a substantial increase in sales of this group.
- 3. The schedule of beefish preserves showed that seasonal sales peak in the summer months due to the holiday season. The sales are growing slightly but steadily, but in the autumn months there is a decline;
- 4. Analysis of the dynamics of canned vegetables group indicates a slight increase in the consumption of these products. The graph shows a slight drop in demand in the spring and summer months, due to the appearance of fresh vegetables on the market.



Figure 2 FRAGMENTS OF RANKED PRODUCT GROUPS' LIFE CYCLES

Based on the product life cycle analysis, general recommendations on product management strategies for different life cycle stages can be formulated, as is shown in Table 3.

 Table 3

 GENERAL STRATEGIC RECOMMENDATIONS

Strategy Elements	Recommended Strategies for the Stage of:					
	Introduction	Growth	Maturity	Decline		
Product Range	Narrow Increasing		Widening due to product extensions	Decreasing to the best-selling products		
Price	High in the case of monopoly, low in the case of competition	Depending on the introduction stage, either falls or grows	Decreases, the profit is sustained by high sales volume	Declines		
Promotion	Introductory advertising and sales promotion Introductory advertising, Reminding reminders closer to the end of the stage		Reminding advertising	Coupons, discounts and other sales promotions		
Competition	Low/High	Grows/Falls	At its highest	At its lowest		

The trends identified during the analysis of the product life cycle allow optimizing the range, display, procurement and stocks of product groups, which will have a positive impact on the profitability of the retail network.

Portfolio approach, reflecting the position of product lines in two-dimensional diagrams, enable us to refine the resulting picture as reflected in Figure 3.

Based on the positions of product groups and prior analysis of their life cycles, the following recommendations were developed:

- 1. The group of water and drinkables (Stars) should maximize the range, attracting new suppliers, enhancing promotional activities, improving merchandizing display and increasing the volume of purchases from April to September, as well as reducing the volume of purchases and narrowing of the range up to the most popular positions after the peak season;
- 2. Bee fish preserves (Question Marks) require an increase in procurement and active advertising from July to September, followed by a decrease in inventory levels and promotion costs;
- 3. The group of bulk products (Question Marks) can achieve an increase in sales volumes if the range of traditional goods is extended as well as products with an innovative component, including fast food;
- 4. For canned vegetables (Dogs), the seasonality of consumption must be taken into account, as the above graph shows a slight drop in demand in the spring and summer months, due to the appearance of fresh vegetables on the market. In addition, a half of the Russian citizens have summer cottages in the countryside, 47% of those who have land plots use them for vegetable and fruit gardening (nasledie-don.ru, 2015). Therefore, stocks should be minimized from May to September.



Figure 3 MODIFIED BCG MATRIX FOR RANKED PRODUCTS

High

Relative Market Share

CONCLUSION

The study confirmed the adequacy of secondary data for retail network's range optimization in order to achieve customer satisfaction and loyalty.

The current study, based on data from three retail networks, showed that the proportion of product lines to retail stores should be: product group A - 60%, product group B - 20% and product group C - 20%.

These findings are consistent with the literature on retail center consumers (Fazlzadeh, Sahebalzamani, Sarabi, 2012; Martynova and Valeeva, 2015) and on quality management in trade (Sharafutdinova and Valeeva, 2015; Valeeva, Kulkova, Sharafutdinova, 2014). Although many studies examine these issues for the sales network (Muromkina, 2001; Nazarov, 2010; Nikishkin and Tverdokhlebova 2012, Abrudan and Plaias, 2013; Cheremisinov, 2004), this article's contribution is filling a gap in academic literature and investigating the challenge of optimizing the range of a retail network based on end consumer demand for the first time.

Thus, a consistent application of the proposed tool allows justifying the policy of retail network, reducing inventory, speeding up the turnover of circulating assets, increase turnover and improve profitability.

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INTERNAL CONTROL AND COMPLIANCE-CONTROL AS EFFECTIVE METHODS OF MANAGEMENT, DETECTION AND PREVENTION OF FINANCIAL STATEMENT FRAUD

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ABSTRACT

This article discusses the problem of financial statement fraud. It should be noted that the fraud with the financial statement leads to financial and non-financial loses, such as deterioration of business reputation and image of the company, decline an investment and consumer appeal, the destruction of relationships with business partners and other loses, that can have a negative impact on the company's activity. The article points out that internal control is one of the effective methods of management and control the activity of organization, describes the method of external and internal accounting compliance-control as one of the method of prevention of financial statement falsification.

Key Words: Financial statement fraud, falsification of financial statement, internal control, COSO, ERM COSO, compliance-control, external compliance-control, internal compliance-control

INTRODUCTION

Financial statement fraud is one of the main problems of the economic world. External and internal users of the financial statements is increasingly cast doubt on the financial statement, and regulatory authorities can't claim with certainty that financial statement is reliable and prepared in accordance with all regulatory and ethical provisions of the activities of accountants and auditors.

In the current economic conditions the cause of fraud is using of different methods to measure assets and liabilities. Thus the improvement of financial reporting quality which is the basic source for the conduction of enterprise's financial state and results of activity analysis is continuously connected to the efficiency of assets and liabilities, their quantification and classification (Kulikova, L.I., Grigoryeva, L.L., Gubaidullina, A.R., 2014, p.61). It's important to note the fact that the companies try to show the results of its business in the best light, increase the attractiveness to investors and the value of its own capitalization.

The aim of the research is to describe the possibility of internal controls in improving the process of management in the company, to work out the model of compliance-control, which can improve the quality of the financial statement.

METHOD

Since the beginning of the twentieth century the problem of falsification was actively studied by researchers. Among them are: Gerard M. Zack, Rezai Zabiholla, Joseph T. Wells, Sherr I.F., Arinushkin N. S. and others. For example Ya.M. Galperin noted that falsification represents the distortion of balance sheet resulting in changes in the material contents of accounts and groups of balance sheet items (Galperin, 1925). I.F. Sherr claimed that falsification of the reporting is directed on distortion of a condition and a size of property and profitability of a company (Sherr, 1926). N. S. Arinushkin narrowed a falsification problem to balance sheet and the misstatement of its items (Arinushkin, 1927) (Kulikova, L.I., Gafieva, G.M., 2014, p.41).

Financial statement fraud often starts with a small misstatement or earnings management of quarterly financial reports that presumes not to be material but eventually grows into fullblown fraud and producing materially misleading annual financial statements (Zabihollah Rezaee, 2002, p.336).

It's important to note that there is no effective method to control the quality of financial statement nowadays. In our opinion among the tools that can detect and prevent falsification and manipulation of financial statement, can be consider internal control and compliance-control as one element of internal control system.

Concerning the research of Association of Certified Fraud Examiners (ACFE), the typical organization loses 5% of revenues each year to fraud (Association of Certified Fraud Examiners, 2014).

Next, examine the possibility of the internal control as the method of management, and compliance-control as the method of detection and prevention of financial statement fraud

The main method used in this study is the comparison method, the methods of analysis and synthesis

RESULT

Internal control originated in the United States after major scandals involving the falsification of financial statements.

The Sarbanes-Oxley Act was enacted in 2002 after a number of corporate scandals in the United States, connected with disturbances in corporate governance and financial reporting in the cases of Enron, Tyco International, Peregrine Systems, and World-Com, which led to multimillion investors' losses (Tofeluc E., 2015, p. 57). The Sarbanes-Oxley Act (SOX) mandates management evaluation and independent audits of internal control effectiveness (Ashbaugh-Skaife, H., Collins, D., Kinney Jr., W., Lafond, R., 2009, p. 41). The law consists of eleven sections and applies to US and international companies whose securities are registered with the Securities and Exchange Commission (SEC).

The purpose of the Sarbanes-Oxley Act is to protect investors, to increase the reliability of financial statement, which is the foundation of a prosperous economy and a developed capital market. Sarbanes-Oxley Act aimed at tightening measures of responsibility of managers and chief financial officers for financial statement.

The four principles the Sarbanes-Oxley Act are reflected in Figure 1.

The law requires the establishment of the Audit Committee and the introduction of the system of internal control over financial statement for all public companies. The Audit Committee is a group of people, consisting of Board members (minimum three persons), which

is not assigned operational management functions. The Committee's work aim is to increase the credibility and reliability of financial statement. Many have claimed that the passage of SOX imposed an extreme burden on SEC registrants by requiring them to document, evaluate, publicly report, and have audited the effectiveness of their internal controls (Hollis Ashbaugh-Skaifea, Daniel W. Collinsb, William R. Kinney Jr, 2007, p.166).

According to the law, the internal control system must meet requirements of the Committee of Sponsoring Organizations of the Treadway Commission (The Committee of Sponsoring Organizations of the Treadway Commission- COSO).





Internal control is a process aimed to improve the effectiveness of operational activity of the company, to increase reliability of financial statement and to achieve consistency of company's activity to existing laws and regulations. In the implementation of the internal control are involved, board of directors, senior management and all staff in general (Committee of Sponsoring Organizations of the Treadway Commission Internal Control, 2013).

Model of internal control, established by the Committee of Sponsoring Organizations of the Treadway, was presented in the form of a cube, which is called «cube ERM COSO» (Figure 2).

Figure 2 THE CUBE ERM COSO (COMMITTEE OF SPONSORING ORGANIZATIONS OF THE TREADWAY COMMISSION INTERNAL CONTROL, 2013)



The front face of the cube consists of five major components of internal control (Committee of Sponsoring Organizations of the Tread way Commission Internal Control, 2013):

- 1. control environment;
- 2. assessment of risks;
- 3. control procedures;
- 4. information and communication;
- 5. monitoring

The top face of the cube consists of three objectives. Every internal control system should achieve this objective - operational objectives, ensuring the reliability of financial statement and compliance with existing rules.

The right side of the cube is represented by units and processes of the company. This indicates that the internal control should be carried out in each unit and process.

However, when a system-based approach to audit and internal control was replaced by a risk-based approach, COSO internal control model has undergone some changes in 2005 (Figure 3).

Figure 3 THE MODIFIED CUBE ERM COSO (SARA LORD, 2013)



In addition to the five main components of the internal control system, the modified model of the cube includes three components:

- 1. goal setting management of the company should choice objectives, which will correspond to the strategy and mission of the company, as well as the level of risk that an organization can take;
- 2. defining events to identify potential events that may affect the company's activities in implementing the strategy and achieving the potential targets. Events leading to the potentially negative consequences are risks that must be evaluated by management.
- 3. response to the risk management of the company may take a particular risk, reject it, or to diversify.

The top face of the cube, which reflects the objectives of the internal control system, expanded. Thus, in a modified form of a cube «ERM COSO» four kinds of targets allocated:

- 1. strategic goals it's results of operations, which company try to achieve in the long term. The base of the strategic goals is the mission of the organization;
- 2. operational goals goals of the organization associated with the achievement of objectives in the short term, the implementation of the current control and distribution of resources of the organization.
- 3. preparation of financial statement actions, which are aimed at ensuring the reliability and integrity of the financial statement;
- 4. compliance with the law observance of laws and regulations in the implementation of the company's activities

The right side of the modified model «COSO» cube includes the following levels of the organizational structure:

- 1. the company (enterprise) as a whole;
- 2. subsidiaries (branches);
- 3. departments and divisions;
- 4. economic units.

In the COSO model the separation of these levels assumes that the process of internal control and risk management should be implemented at all levels of the organizational structure of the company.

COSO is one of the basic models of construction of internal control in organizations. Many countries use COSO as a basis to develop their own regulations for internal control in organizations.

Under conditions of instability of the current economic situation and fierce competition, companies should pay great attention to the construction of an effective system of corporate management and control, as well as minimizing the various risks that affect the activities of the economic entity.

The internal control system of the majority companies has the form as shown in Figure 4.



Figure 4 THE STRUCTURE OF THE INTERNAL CONTROL SYSTEM

In our opinion, the existing internal control system is not able to fully meet the requirements of the current economic situation; therefore, the system of internal control of commercial enterprises should have the following form (Figure 5).

Compliance-control is an element of the internal control system that is aimed to ensure compliance by the economic subject of internal and external regulations, ethical and business standards, as well as preventing various falsification schemes of financial statement in order to improve the competitiveness, reputation and financial interest from outside users.

Compliance-control has a two-tier structure:

- 1. external compliance-control control over compliance with external rules and regulations;
- 2. internal compliance-control control over compliance with internal (corporate) rules and regulations.

6):

Figure 5 THE MODIFIED STRUCTURE OF THE INTERNAL CONTROL SYSTEM



As part of the problem, the emphasis should be on compliance-control in the field of accounting and financial statement – accounting compliance-control.

In our opinion, among the purposes of external accounting compliance-control there should be allocated:

- 1. formulation, clear explanation existing and new regulations and standards of accounting;
- 2. assessment and risk management, development and implementation of measures to reduce the risk of financial statement fraud;
- 3. establishment of clear system of coordination between the authorities, responsible for the formation of standards of accounting and financial statement , with economic entities and the auditors;
- 4. the implementation of independent verification of financial statements for falsification, compliance of accounting operations to requirements of legal acts;
- 5. control over the creation and effective functioning of the internal compliance-control of business entities.

Thus, we have the following model of the external accounting compliance-control (Figure

Figure 6 THE MODEL OF THE EXTERNAL ACCOUNTING COMPLIANCE-CONTROL



As Figure 6 shows, in our opinion, the functions, assigned to the Standards Board, should be as follow:

- 1. provide explanatory material for the using of both domestic and international standards to business entities, taking into account their sector of activity;
- 2. carry out independent audit of the financial statement in order to prevent distortion and falsification of financial statement's data;
- 3. regulation of the process of building an internal compliance control by subjects of economic life;
- 4. control over the effectiveness of functioning the internal compliance -control in the activities of economic entities.

Figure 7 is a diagram, which shows the functioning of the external compliance control when the company has the problems in the application of accounting standards and financial statement.

The description step by step of the external compliance-control is presented below:

- 1) sending a request for clarification to the Standards Board;
- distribution of received request (taking into account type) to one of three committees (the Committee on the specifics of the application of national accounting standards, the Committee on the application of IFRS and US GAAP, the Committee on the specific application of accounting standards and reporting in various sectors);
- 3) consideration of received requests by one or more committees, depending on the nature of the request;
- 4) The Committee makes a decision on the presence or absence of problems in the application of accounting standards and financial statement on incoming request (if committees have problems in consultation with the Standards Board, there would be the decision on request);
- 5) preparation of recommendations (explanations) and information material and sending to an economic entity that made the request.

Figure 7 THE SCHEME OF FUNCTIONING OF THE EXTERNAL ACCOUNTING COMPLIANCE-CONTROL



In case of need of an independent review of financial statement o and the effectiveness of internal compliance control:

- 1. The Standards Board is sending a request for an independent review to the Committee of independent verification and evaluation process of the financial statements and the effectiveness of internal compliance;
- 2. The Committee for independent verification and assessment of the reporting process and the effectiveness of internal compliance-control carries out verification and concludes on the results of checks:
 - a positive result;
 - a positive result with remarks (with further checking eliminated remarks);
 - a negative result.

3. Preparation of recommendations (explanation) and information material and sent to an economic entity for the relevant amendments.

Thus, it must be concluded that the establishment of an external -compliance control under the supervision of a public authority can contribute new rules in corporate culture of companies, in which head is the goal of compiling reliable financial statements and goodwill.

It is important to note that between the external and internal compliance-controls should be a direct relationship.

Compliance-control of internal level should not only monitor the observance of external rules and regulations, but also internal, such as corporate ethics, the Charter of the organization, accounting policies and other internal regulations.

In our opinion, the most effective form of internal compliance-control is centralized model, when an individual is responsible for the functioning of the entire compliance-control system. (Figure 8).

According to the centralized model, in each functional department on a particular specialist assigned controller responsibilities within its functions. Controllers report to the heads of departments, who are responsible for management decisions related to the process of compliance monitoring within their competence. Heads of functional departments, in turn, report to the Head of compliance-control department, who is responsible for the implementation and effective functioning of the system compliance-control in general.



Figure 8 CENTRALIZED MODEL OF INTERNAL COMPLIANCE-CONTROL
As part of our research we should focus on the internal accounting compliance -control. We give a definition of this concept. Internal accounting compliance control is an organization management concept, which is based on the principle of compliance with existing external (national standards, IFRS, US GAAP) and internal (accounting policies, Code of Corporate Governance Charter) standards and regulations in order to ensure effective management and functioning of the organization .

Here are the basic functions to be performed by a system of internal accounting compliance:

- 1. ensure the reliability of accounting and reporting of data;
- 2. control over the observance of external regulations, impose appropriate requirements for accounting and financial reporting;
- 3. assessment and financial risk management;
- 4. control over observance of internal corporate regulations (Statutes, Code of Ethics, Corporate Governance Code, the accounting policies and other);
- 5. promote and support the work of the external compliance control;
- 6. support business decision-making and others.

CONCLUSION

The problem of financial statement fraud is relevant today. Losses from the falsification of accounting data have an impact not only on the management, staff, shareholders of economic entity, but also external users, such as investors, banking institutions, lenders, and others. It's important to note that modern economic situation needs in developing an effective methodical device that would facilitate both the detection and the prevention of distortion of accounting data. In our opinion effectively constructed system of internal control and compliance control will improve the process of management and control in companies.

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MANAGEMENT OF ENVIRONMENTAL LOAD FACTORS ON THE TERRITORY OF THE SOCIO-ECONOMIC WELL-BEING OF THE POPULATION

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ABSTRACT

The article provides insights into the methodological approaches to the complex evaluation of the people quality of life associated with the analysis of the interaction between social and economic well-being and environmental quality. The study offers the results of the mathematical calculations which demonstrate the relation between the level of well-being of the population and the level of the ecological environment's development based on the cases of the municipal areas of the Republic Tatarstan, Russia. The key policy recommendations aiming at the improvement of the people quality of life vis-à-vis the features of the municipal development are postulated.

Key Words: Management of Environmental Load Factors, Population Well-Being, Environment, Environmental Load, Social and Economic Development

INTRODUCTION

The publication is prepard in the framework of the research project N15-32-01353 supported by the Russian Foundation for Humanities.

The evaluation problem of environmental load impact on the well-being of the population rose most sharply in the 21st century.

Economic development goes, unfortunately, without due regard to depletion of many species of non-renewable natural resources and understanding of the fact that the recovery abilities of wildlife are not unlimited and economic development without considering environmental laws is fraught with catastrophic consequences. The territory of the Republic of Tatarstan is subject to intense human impacts.

To analyze the impact of environmental conditions on the quality of living of the population in the certain administrative districts and regions we have been evaluated individually the level of well-being of the population and environmental load of the area. It was based on the methodology of constructing composite indices. As a result there were obtained integral indicators of habitat quality (IHQ) and well-being of the population (IWP) (S.A.Ayvazyan, V.S.Stepanov, M.I.Kozlova, 2006, p. 18; M.I.Volkova, 2010, p.62).

Modelling of the ecological environment interaction system and the well-being level of the population showed a direct relationship between the considered factors. The level of wellbeing of the population in the corresponding city or municipal area is above when the level of ecological environmental takes maximum negative values. In this context, multi-factor model that defines the relationship between IWP and environmental parameters demonstrates a direct relationship. It is not possible to develop a system of state influence on the ecological environment in the Republic of Tatarstan.

In this regard, it was proposed to introduce a new indicator that shows the relationship between IWP and IHQ. As such a measure appears IP index. IP index reveals the ratio between the level of well-being of the population and the development level of the ecological environment IP = IWP / IHQ (I.I.Eliseeva, S.V.Kurysheva, T.V.Kosteeva and others, 2005, 576 p.; K.Sh.Ziyatdinov, A.V.Ivanov, 2005, P. 16; A.V.Ivanov, 1997, 135 p.). A lower value of IP index indicates a high level of well-being in relation to the level of the environmental load of the analyzed territory. This relative indicator shows the delivery degree of the environmental pollution of the certain territory, in other words: what level of well-being of the population compensates the environmental load. The greater the value of IP index is the more positive situation is in the region (Figure 1).

Figure 1 FORMATION OF THE CARTOGRAPHIC ENVIRONMENT REFLECTING THE ZONING OF THE MUNICIPALITIES AND CITIES IN THE REPUBLIC OF TATARSTAN BY THE LEVEL OF THE ECOLOGICAL ENVIRONMENT IMPACT ON THE LEVEL OF WELL-BEING OF THE POPULATION (IP INDEX)(I.B.USHAKOV, 2003, 442 P.)



Color	Index description	Total points
	High (sufficient)	23 and above
	Satisfactory	From 10 to 23
	Not-sufficient	from 7 to 10
	Low (cause concern)	below 7

METHODS

For example, the IP value for Kazan, despite the high rates of quality of living, income and socio-economic development in general, is 2.03 points, while for Baltasinsky area IP = 12,9 points. Hence, it follows the following conclusion that the considerable importance of the level of environmental pollution significantly reduces the return on investment and effort in the development of the district; therefore, it is necessary, first, to affect those areas in the Republic of Tatarstan, where the IP value gets its minimum. Reducing of the IHQ level by the immutability for the index of the well-being of the population will allow raising the level of IP for a particular municipal area (M.J.Sirgy, A.C Michalos, A.L.Ferriss, R.A.Easterlin, D.Patrick, W.Pavot, 2006, P. 466).

A set of independent factors in the econometric model IP included only those factors that adversely affect the quality of the environment, with a view to a deep analysis of the negative environmental impact on the relative well-being of the population.

Thus, as independent, explaining the factors for IP index, were taken the following parameters:

Characterizing the state of the atmospheric air:

- 1. The share of trapped and neutralized pollutant substances to the total amount of pollutants emitted by all stationary sources that are located on the territory of the municipality, % (Factor_1);
- 2. The amount of harmful (polluting) substances into the air from stationary sources located on the territory of the municipality, thous. ton. (Factor_2);
- 3. The amount of harmful (polluting) substances into the air from vehicles registered in the territory of the municipality, thous. ton. (Factor_3);

4. Pollutant emissions from stationary sources per capita, kg / person (a negative indicator) (Factor_4); Characterizing the state of water resources:

- 5. The share of contaminated (untreated) waste waters in total volume of water disposal in the municipality, % (Factor_5);
- characterizing the quality of drinking water for the sanitary-chemical and microbiological parameters:
- 6. The proportion of non-standard samples for sanitary-chemical indicators (Factor_6);
- 7. Discharge of polluted waste waterы into surface water bodies, mln. cum (Factor_7);
- 8. The amount of available and generated emissions net used and rendered safe, thous. ton (Factor_8);
- 9. The share of recultivated lands, % (Factor_9).

All of these factors (Figure 2) are statistically measurable indicators that can be found in the published statistical books. In the presented methodical recommendations, there were used data for 2009. (The Republic of Tatarstan: the results of socio-economic development in 2009; Short Statistical Book., 2010, p.86; A.Z.Farrakhov, A.A.Gilmanov and others, 2010, p.245).

Figure 2 THE DATABASE OF INDICATORS FOR THE IMPLEMENTATION OF THE FACTORIAL ANALYSIS

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<u>Ф</u> айл Правк	а <u>В</u> ид Данны	ые Преобразо	вать <u>А</u> нализ	Прямой марк	етинг Графика	а <u>С</u> ервис <u>О</u>	кно <u>С</u> правка			
i 🔁 🗄			¥ 🎦 i	!	åå 🍇		- A	 1⊷		166
1:Индекс_отр	1: Индекс_отдачи 22,50									
	Factor_1	Factor_2	Factor_3	Factor_4	Factor_5	Factor_6	Factor_7	Factor_8	Factor_9	Индекс_отда чи
4	21,10	,18	2,82	5,80	,00	4,10	,17	,60	,00	31,00
5	58,40	,49	2,95	18,70	,00	9,09	,40	,64	,00	24,50
6	,00	,08	1,84	3,60	,00	8,20	,03	2,00	,00	23,00
7	7,90	51,76	26,32	266,10	,00	22,94	17,00	1194,49	,00	13,50
8	98,40	,09	2,45	4,10	,00	4,05	,04	7,79	,00	26,50
9	95,40	,24	5,99	4,60	85,62	22,89	1,46	78,88	,10	7,60
10	96,90	,04	1,42	3,20	,00	22,89	,01	,40	,00	18,00
11	1,10	4,18	4,03	111,50	2,94	38,89	,68	11,69	,03	19,33
12	70,10	,39	3,81	11,50	,00	16,67	,12	3,93	,00	27,00
13	68,90	2,24	16,32	20,00	,00	2,49	9,98	323,70	,11	27,50
14	88,80	1,38	3,80	30,50	25,00	,00	,48	155,17	,00	24,00
15	13,70	,18	1,58	10,70	23,53	13,04	,17	5,80	,00	13,33
16	51,40	,76	5,98	17,50	27,10	27,78	1,07	8,33	,00	17,33
17	94,70	,34	1,56	13,00	66,67	25,00	,03	9,25	,00	9,75
18	1,00	7,86	7,56	96,90	8,40	8,67	4,76	14,84	,00	24,00
19	8,50	9,49	5,13	163,20	5,84	12,40	3,76	253,57	,00	16,67
20	45,50	2,85	10,48	17,80	5,40	2,99	9,82	151,31	,00	19,50
21	,00	,03	1,26	1,70	100,00	,00	2,94	4581,96	,02	8,00
22	,00	,09	1,95	5,30	,00	87,50	,09	8,84	,00	8,20
23	82,00	,16	4,64	3,10	,00	,00	,72	,29	,00	24,50
24	28,40	3,35	5,07	90,50	,00	4,13	,25	9,94	,00	26,00
25	11,40	7,14	9,41	80,30	,32	18,71	3,13	20,81	,56	30,50
26	,00	1,35	3,42	29,70	,00	5,01	,85	59,24	,00	21,00
27	89,90	1,01	2,40	33,20	,00	11,11	2,41	42,48	,00	25,00
28	79,20	,38	2,35	12,50	,00	7,91	,41	80,42	,00	21,50
29	44,40	,01	2,06	,20	,00	19,00	,08	,20	,00	28,50
30	73,80	64,87	24,64	244,50	,08	60,00	60,58	1,30	,00	10,12
31	,00	,76	1,59	49,60	,00	17,07	,16	489,75	,00	29,50
32	6,00	9,91	3,82	163,70	,00	23,44	,87	323,98	,43	13,67
33	,40	,24	3,06	8,30	,00	28,47	,63	5,52	,00	14,00
34	19,50	,07	2,29	2,40	26,67	17,39	,15	14,24	,09	13,67
25	4.00	24.04	2.10	740.00	2.57	22.02	20	4.00		0.00

The construction of multiple linear regressions was performed using SPSS STATISTICS 19 package. To perform basic MNK's prerequisites there has been implemented a step selection algorithm for the factors to eliminate multicollinearity.

As a result of the regression construction we obtained 4 mathematical models:

Based on the evaluation of the determination coefficient, reflecting the adequacy of the constructed model, we have selected the last (highest adjusted R^2 and minimal residual variance S^2_{Ost})

IP = 21,9 - 0,175* Factor_3 - 0,027* Factor_4 -- 0,204* Factor_5 - 0,281* Factor_6

Figure 3 CORRELATION BETWEEN THE INITIAL AND CALCULATED VALUES FOR THE OBTAINED MODEL



The calculated values that were obtained in the process of the factorial analysis The initial values IP

In connection with the statistically insignificant coefficient of regression and due to the lack of close connection with the dependent factor of the model we have excluded Factor_1, Factor_2, Factor_7- Factor_9 (the partial correlation coefficient is less than 0.15).

Model		Unstandardiz	ed coefficients	Standardized coefficients	t	Val.
		В	Std.Error	Beta		
	(Constant)	22,105	3,398		6,506	,000
	Factor_1	,009	,055	,023	,154	,878
	Factor_2	,078	,209	,079	,372	,712
	Factor 3	-,270	,236	-,384	-1,146	,260
1	Factor 4	031	.019	-,290	-1,599	.119
	Factor 5	207	.082	353	-2.536	.016
	Factor 6	292	.111	380	-2.632	.013
	Factor 7	.034	.160	.091	.215	.831
	Factor 8	.000	.007	.011	.031	.975
	(Constant)	22,115	3.337	,011	6,628	,000
	Factor_1	,008	,053	,023	,153	,879
	Factor_2	,078	,206	,079	,378	,708
2	Factor_3	-,269	,226	-,381	-1,189	,242
2	Factor_4	-,031	,019	-,290	-1,621	,114
	Factor_5	-,207	,080	-,353	-2,581	,014
	Factor_6	-,293	,108	-,380	-2,721	,010
	Factor_7	,038	,123	,099	,306	,762
	(Constant)	22,374	2,834		7,895	,000
	Factor_2	,080	,203	,081	,396	,695
	Factor_3	-,260	,215	-,368	-1,207	,235
3	Factor_4	-,031	,018	-,297	-1,732	,092
	Factor_5	-,205	,078	-,349	-2,632	,012
	Factor_6	-,294	,106	-,381	-2,764	,009
	Factor_7	,035	,120	,091	,289	,774
	(Constant)	22,203	2,738	007	8,109	,000
	Factor_2	,096	,192	,097	,501	,619
4	Factor_3	-,206	,110	-,293	-1,8/3	,069
	Factor_4	-,032	,018	-,300	-1,833	,075
	Factor_5	-,205	,077	-,340	-2,030	,012
	(Constant)	-,295	,105	-,304	-2,022	,000
	Eactor 3	- 175	000	- 249	-1 0/15	,000
5	Factor 4	-,175	,050	-,249	-1,743	,059
5	Factor 5	-,027	,014	-,233	-1,942	,039
	Factor 6	-,204 201	,070	-,340	-2,005	,011
	racior 0	201	.100	303	-2.010	.000

Table 1THE COEFFICIENTSA

a. Dependent variable: Return_Index

Model		Beta inclusion	t	Val.	Partial	statistics collinearity
					correlation	Tolerance
2	Factor_8	,011 ^a	,031	,975	,005	,139
2	Factor_8	$,000^{\rm b}$,000	1,000	,000	,145
3	Factor_1	,023 ^b	,153	,879	,025	,801
	Factor_8	,048°	,184	,855	,030	,245
4	Factor_1	,015 [°]	,107	,915	,018	,822
	Factor_7	,091°	,289	,774	,047	,169
	Factor_8	,069 ^d	,269	,790	,044	,252
5	Factor_1	,018 ^d	,125	,901	,020	,823
5	Factor_7	,126 ^d	,420	,677	,068	,183
	Factor_2	,097 ^d	,501	,619	,081	,436

Excluded variables^e

a. The predictors in the model: (constant) Factor_4, Factor_5, Factor_6, Factor_1, Factor_2, Factor_3, Factor_7

b. The predictors in the model: (constant) Factor_4, Factor_5, Factor_6, Factor_2, Factor_3, Factor_7

c. The predictors in the model: (constant) Factor_4, Factor_5, Factor_6, Factor_2, Factor_3

d. The predictors in the model: (constant) Factor_4, Factor_5, Factor_6, Factor_3

e. Dependent variable: Return_Index

RESULTS

The results of econometric modeling, evaluation of beta coefficients and elasticity coefficients showed that the return index of ecological potential is influenced by several indicators, the increase in value of which will negatively affect the quality of living of the population and, consequently, on their well-being, (in descending order of the influence degree):

- 1. The proportion of non-standard samples for sanitary-chemical indicators, % (Factor_6);
- 2. The share of contaminated (untreated) waste waters in total volume of water disposal in the municipality, % (Factor_5);
- 3. The amount of harmful (polluting) substances into the air from vehicles registered in the territory of the municipality, thous. ton. (Factor_3);
- 4. Pollutant emissions from stationary sources per capita, kg / person (a negative indicator) (Factor_4);

The developed model describes the influence degree of various risk factors of the environment on return index for the ecological potential with reliability of 70% (within the limits of standard). This says that the model is stable enough, the conclusions of the results are correct and can be used in further analysis, as well as can be taken into account while making management decisions.

The leading predictor in the model is the proportion of non-standard samples for sanitarychemical indicators. For example, with an increase in the value of this factor to 10%, the return index for the ecological potential decreases by 2.8. In comparison with the increase in the proportion of contaminated (untreated) waste waters in total wastewater of the municipality by 10% - will fall by 2; if the increase in the level of pollutant emissions from stationary sources per capita and harmful (polluting) substances into the atmosphere from vehicles registered in the territory of the municipality, at 10 kg per person, and 10 thousand tons respectively – the dependent factor is reduced by 0,175 and 0,027 points. To build an econometric model describing the impact of environmental components based on our relative index IP, as a resulting feature there has been selected IP index mentioned above, as the explanatory figures the authors hypothesized multiple impact by a number of factors. Herewith it is predetermined that the model should be mainly focused on the improvement of health outcomes of the population as the highest values of quality of living by reducing the environmental load on the population that live in the area.

The indicators that reflect the state of the environment are the following (in groups):

1. The state of atmospheric air:

- The proportion of trapped and neutralized pollutant emissions to the total amount of pollutant substances emitted by all stationary sources located on the territory of the municipality, %;
- The amount of harmful (polluting) substances into the air from stationary sources located on the territory of the municipality, thous. tons;
- The amount of harmful (polluting) substances into the atmosphere from the vehicles registered in the territory of the municipality, thous. tons;
- Pollutant emissions from stationary sources per capita, kg/person (a negative figure);

2. The state of water resources:

- The proportion of contaminated (untreated) waste waters in total water disposal in the municipality, %;
- The quality of drinking water for the sanitary-chemical and microbiological parameters:
- The proportion of non-standard samples for sanitary-chemical indicators;
- Discharge of polluted waste waters into surface water bodies, million cum (a negative figure).
- 3. The state of land sources:
 - The share of recultivated lands in the municipality, %
- 4. The condition of the plant world:
 - The degree of landscaping settlements (the ratio of the area occupied by green spaces, the total area of the settlement) in the municipality, %
- 5. The state of management system for production and consumption wastes:
 - The share of used, neutralized wastes in the total amount of the generated waste during production and consumption in the municipality, the proportions
 - The share of secondary collected material resources in the total volume of the generated solid household and industrial wastes in the municipality, %.

Econometric analysis of the impact for the considered indicators that reflect the influence on the environment has revealed some features. The carried-out analysis showed the presence of forward and backward linkages between the individual indicators characterizing the state of the environment and indicators, which assess the quality of living for the population in terms of social well-being.

The relationship established between the factors that reflect the impact on the environment with the aim to reduce the environmental load and characterize the public health of the population is presented in Table 2.

The main factors for reducing the environmental load are as follows:

- 1. Capture of pollutant substances from the total amount of pollutants emitted by all stationary sources;
- 2. Collection of secondary material resources generated from municipal solid and industrial wastes;
- 3. The use and disposal of wastes in the total amount of wastes generated during production and consumption in the municipality.

Table 2IDENTIFICATION OF THE RELATIONSHIP BETWEEN THE FACTORS THAT REFLECT THEIMPACT ON THE ENVIRONMENT WITH AIM TO REDUCE THE ENVIRONMENTAL LOAD AND
CHARACTERIZE THE PUBLIC HEALTH OF THE POPULATION

	Life expectancy, years (Y ₁₎	The birth rate per 1000 people. Population (Y ₂₎	The mortality rate per 1000 people. Population (Y_{3})
The proportion of the used, neutralized wastes in the total amount of wastes generated during production and consumption in the municipality, proportions (F_9)	-	Revealed the existence of a direct link	-
The proportion of trapped pollutant substances, in % to the total quantity of pollutants emitted by all stationary sources (F_10)	Revealed the existence of a direct link	-	Revealed the existence of a feedback
The share of secondary collected material resources in the total volume of the generated solid household and industrial wastes, % (F_11)	Revealed the existence of a direct link	-	Revealed the existence of a feedback

Based on data from the table, we built regression models for each of our coverage criteria for public health, which allow to assess the effectiveness degree of measures for the reduce of the environmental load.

As a result of regression analysis, the following models were prepared:

 $Y1 = 68,75 + 0,015 *F_{10} + 0,371 * F_{11}$

 $Y2 = 12,06 + 0,014 * F_9$

 $Y3 = 16,08 - 0,026 * F_{10} - 0,597 * F_{11}$

Interpretation of the first model allows us to conclude that every additional percentage of increase by the share of secondary collected material resources in the total volume of the generated solid household and industrial wastes, increases life expectancy by an average of 0.37 years (4 months), and the increase of trapped pollutant substances in % to the total quantity of pollutants emitted by all stationary sources, by 10% increases the life expectancy by 0.15 years (2 months).

Thus, on life expectancy and mortality rates the greatest impact has the following measures:

- 1. The collection of secondary material resources generated from municipal solid and industrial wastes;
- 2. The use and disposal of wastes in the total amount of wastes generated during production and consumption in the municipality, the proportion.

The birth rate is more significantly affected by the use and disposal of wastes generated during production and consumption in the municipality.

In response to this study we can confidently assert that to improve the quality of the environment and, consequently, to increase the well-being and quality of living of the population, it is necessary to carry out a strict control over the results of the implementation for

the main measures to reduce the environmental load, especially in the industrial areas of the Republic of Tatarstan.

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UNIVERSAL BUSINESS ACTIVITY LEVEL HIGHLITES IN THE FINANCIAL MANAGEMENT SYSTEM

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ABSTRACT

The article discusses the practicability of making the effective management decisions based on the permanent monitoring of key universal business activity level highlights of modern companies. Problem of the analysis and assessment of business activity remains poorly developed, though it has many methods. This is due to the fact that each author offers a variety of methods for fundamental highlights calculation, which do not always fully recreate the complete picture of the company's effectiveness. The authors research the practical application area of the business activity indicators, including for the grounded management decisions concerning the evaluation of investment attractiveness and efficiency of assets utilization of the modern companies. To justify the proposed hypotheses of relationship between the business activity and goodwill, the financial highlights were considered for several major Russian companies: PJSC Lukoil, OJSC Rosneft and PJSC Uralkali, which assessment allows the investor to assess the business activity of companies in different industries in the shortest time. The analytic highlights of all the companies were included sales revenue, net profit, capital expenditures, EBITDA. The model of highlights developed by the authors can be used by investors to quickly assess the company's goodwill.

Key Words: Business Activity, Level Highlights, Intangible Assets, Goodwill

INTRODUCTION

Until the end of the 20th century, the market value of the companies was comparable to their net assets carrying value as the income of the companies was depended only on the value of the tangible assets under their control. However, there is a growing gap between the market and carrying value of corporations under the conditions of the increasing pace of technological innovation and company's interest in possession of the objects defining its unique position in comparison with the competitors in the market. Since then, a growing income share of the large multinational companies has been determined by use of exclusive rights on intellectual properties, i.e. intangible assets. Nevertheless, currently, the information generated for the purposes of its subsequent disclosure in the financial statements of companies regarding intangible assets, including intellectual properties, is still insufficiently representative.

So, this fact was noted in the study of the company Brand Finance in December 2007. (Brand Finance, Accessed December 7, 2015) In this report there were presented the representative sample of the world's largest public companies (Fig. 1) and made proposals on improvement of accounting statements (EBRC). In particular, it was noted that at that time about 75% of the value of modern companies was not disclosed in their published financial statements at all. It should be noted that the mentioned ratio of the company's value composition was broken

by the financial crisis of 2008, but every year is aligning and coming to the same values; moreover, in the context of the ongoing production intensification as well as the increasing role of the technological development, it is correctly to assume that the share of assets not reflected in the financial statements may increase in the near future.





THEORY

At the present stage of economic development, the essence of the company's business activity is shown through the category of efficiency of financial, production, labor and other resources use. In addition, the highlight shows the level and quality of business administration, availability of assets, and capital and helps to determine the company's economic growth potential. Therefore, the main criterion of the effectiveness of the company's current activity is its business activity.

In the long-term period, the business activity is transformed into the category of goodwill. The companies, which goodwill is valued highly, also have good business activity highlights (Ding, Y., Richard, J. & Stolowy, H., 2008, p. 718). A positive consequence of high level of the company's goodwill is considerable low-interest credits, business protection against mergers and its further piecemeal sale, simplified access to financial, labor and information sources and other benefits. Goodwill is an extremely important aspect of activities of any company (Unrecognized Intangible Assets Identification, Management and Reporting, Accessed December 7, 2015); work on its strengthening should be carried out continuously, but in reality it is difficult to find a company in the strategic management system of which there is a developed program on its goodwill protection, as well as improvement of the performance that compose its nature "uniqueness".

Therefore, it can be stated the fact that to maintain the company's goodwill at a high level is necessary to carry out the constant monitoring of its growth factors (Lee, C., 2011, p. 236). At the same time, the costs of such activities justify themselves many times, as the consequence of

the business activity growth is strengthening of company's solvency, increasing the value of its shares, acceleration of asset turnover and overall growth of investment attractiveness. In this connection, it should be noted that many of the analysis and evaluation issues of the companies' business activity remain unresolved up to now. This is due to the fact that the diversity of existing methods of its fundamental highlights calculation in most cases cannot recreate the complete picture of the company's effectiveness. In addition, the problem of the analysis and assessment of business activity remains poorly developed, though it has many methods. This is due to the fact that each author offers a variety of methods for fundamental highlights calculation, which do not always fully recreate the complete picture of the company's effectiveness (Liberatore, G. & Mazzi, F., 2010, p. 333).

Analyzing the opinions of various authors (Xu, W., Anandarajan, A. & Curatola, A., 2011, p. 145; Brinck, T., 2005; Chauvin, K.W. & Hirschey, M., 1994, p. 159), it is possible to identify the general principles according to which the business activity is directly dependent on the efficiency of financial, labor and material resources use in the company. It follows that the company should calculate the performance indicators of capital, material and labor resources use. Also, it is reasonable to calculate the turnover, profitability, return on 1 RUB of capital ratios and analyze the financial results.

It is obviously that the business activity of the company is directly connected to its investment attractiveness and investment development. For more clear and understandable analysis of the business activity and success of companies, a number of financial highlights is used to allow the investor to assess its market position and business activity in the shortest possible time (Vetoshkina E. Yu., Tukhvatullin R. Sh., 2015, p. 440).

Figure 2 presents the financial highlights of business activity of the three largest Russian companies: PJSC Lukoil, OJSC Rosneft and PJSC Uralkali respectively - sales revenue, net profit, capital expenditures, EBITDA. We will use them for building the evaluation system of business activity of the companies in different industries.

Figure 2 THE BUSINESS ACTIVITY FINANCIAL HIGHLIGHTS OF PJSC LUKOIL, OJSC ROSNEFT AND PJSC URALKALI

PJSC Lukoil

- Sales revenue, millions of US dollars
- EBITDA, millions of US dollars
- Net profit, millions of US dollars
- Basic earnings per share , US dollars
- Capital expenditures, millions of US dollars
- Share value at MICEX, rubles
 Dividend non share
- Dividend per share, rubles

OJSC Rosneft

- Sales revenue, millions of US dollars
- EBITDA, millions of US dollars
- Net profit, millions of US dollars
- Capital expenditures, millions of US dollars
- Free cash flow, millions of US dollars

PJSC Uralkali

- Sales revenue, millions of US dollars
- Net profit, millions of US dollars
- EBITDA, millions of US dollars
- Total Debt, millions of US dollars
- Net debt, millions of US dollars

For the integrated assessment of the goodwill through the business activity highlights, we suggest using the system of universal analytic highlights presented in table 1. To simplify the calculations, we used the imputed data.

The analytic highlights discussed earlier are filled in the table 1 in the lines 1.1-1.4. In this example, a time step equals to one calendar year, but for the tightening of control over financial highlights, we deem advisable to monitor them quarterly.

Table 1	
THE SYSTEM OF UNIVERSAL ANALYTIC HIGHLIGHTS OF BUSINESS ACTIVITY WHE	N
GOODWILL MONITORING IN THOUSAND RUBLES	

Highlights	Sales revenue	Net profit	Capital expenditures	EBITDA	Value of the business activity in points
1.1. Highlight value for 2012	100	10	20	15	Х
1.2. Highlight value for 2013	90	9	18	13	Х
1.3. Highlight value for 2014	110	7	22	16	Х
1.4. Highlight value for 2015	140	15	37	20	Х
2.1. Highlight value for 2013 with account of the discount rate	81.82	8.18	16.36	11.82	Х
2.2. Highlight value for 2014 with account of the discount rate	100.00	5.91	20.00	14.55	Х
2.3. Highlight value for 2015 with account of the discount rate	127.27	13.64	33.64	18.18	Х
3.1. The ratio of the discounted highlight value for 2013 to the value for 2012	0.82	0.82	0.82	0.79	3.24
3.2. The ratio of the discounted highlight value for 2014 to the value for 2013	1.11	0.66	1.11	1.12	4.00
3.3. The ratio of the discounted highlight value for 2015 to the value for 2014	1.16	2.10	1.53	1.14	5.92

The lines 2.1-2.3 are filled on the basis of the data in the lines 1.1-1.4. However, it should be reasonably to calculate the real cash flow. For this purpose, we use the present value and, in our opinion, the discount factor can be one of the following:

- 1. the rate of return comparable to alternate investments in the capital market;
- 2. the deposit interest rate in a reliable bank (top 20);
- 3. the inflation rate in the country for the reporting period.

The lines 3.1-3.3 contain the ratio of the discounted highlight value of the reporting year to its base value. This is done in order to bring the different highlights to comparable relative values. The obtained relative values or points will be vary between 0 and 10, and in rare cases even more, although, in practice, the company is unlikely to be able to achieve value in 2 points because in this case it should increase the value of its financial highlight more than twofold.

Change in the business activity	Value in conditiona l units	Assessment criterion	Short-term period	Long-term period
in 2013	-0.76	<=0	Business activity decline	Decrease of the goodwill and the total value of the company
in 2014	0.00	0	Business activity is stable	The company will keep the goodwill at the same level and the total value
in 2015	1.92	>=0	Business activity increase	Goodwill will increase, the total value of the company also will increase

 Table 2

 THE MONITORING RESULTS OF THE COMPANY'S BUSINESS ACTIVITY CHANGES

The table 2 shows the changes in the business activity of the company: we use the value of the business activity that we calculated in table 1. Then we take 4 from the value and get the change in the business activity. We use number four as a base, as it reflects the situation, when the highlights increased with account of the cash flows discounting. When the value of change in the business activity is zero, it can be concluded that the activity and goodwill are at the stable level with account of correction for real cash flow. In case of negative change, we have seen the negative trend, i.e. the business activity highlights are decreasing followed by negative assessment of the company's goodwill and loss of a share of its value in the long-term period. The positive change in the business activity is favorable and the company's goodwill estimation is increasing.

RESULTS

We apply the developed model to assess the changes in business activity of the company OJSC Rosneft. The financial highlights of its activity can be found on the official site in the section "About Rosneft". Also, the values of revenue, net profit, EBITDA, CAPEX can be found in the section "Investors". We used the financial highlights published by the company in our model, the discount rate is taken as 10%, and calculations are presented in Tables 3-4.

Highlights	Sales revenue	Net profit	Capital expenditures	EBITDA	Value of the business activity in points
1.1. Highlight value for 2012	3089,000	365,000	473,000	618,000	Х
1.2. Highlight value for 2013	4694,000	388,000	560,000	947,000	Х
1.3. Highlight value for 2014	5503,000	348,000	533,000	1057,000	Х
1.4. Highlight value for 2015	5150,000	355,000	595,000	1245,000	Х
2.1. Highlight value for 2013 with account of the discount rate	4267,273	352,727	509,091	860,909	Х
2.2. Highlight value for 2014 with account of the discount rate	5002,727	316,364	484,545	960,909	Х
2.3. Highlight value for 2015 with account of the discount rate	4681,818	322,727	540,909	1131,818	Х
3.1. The ratio of the discounted highlight value for 2013 to the value for 2012	1,381	0,966	1,076	1,393	4,817
3.2. The ratio of the discounted highlight value for 2014 to the value for 2013	1,066	0,815	0,865	1,015	3,761
3.3. The ratio of the discounted highlight value for 2015 to the value for 2014	0,851	0,927	1,015	1,071	3,864

 Table 3

 THE SYSTEM OF UNIVERSAL ANALYTIC HIGHLIGHTS OF OJSC ROSNEFT'S BUSINESS

 ACTIVITY IN THOUSAND RUBLES

In 2013 compared to 2012, the business activity and, as a consequence, internally generated goodwill have grown. The revenue and EBITDA were increased by more than 38%, the discounted net profit was decreased by 4%, and the capital expenditures were increased by 7.6%.

The period 2014-2015 can be called unsuccessful for the company. In table 4, we can see that the change in the level of business activity in 2015 and 2014 have negative values for the company. This is primarily due to the prolonged oil crisis: lifting of sanctions against Iran, development of slaty companies in USA, struggle of Saudi Arabia and Russia for the Chinese oil market.

 Table 4

 THE MONITORING RESULTS OF OJSC ROSNEFT 'S BUSINESS ACTIVITY CHANGES

Change in the business activity	Value in conditional units	Assessment criterion	Short-term period	Long-term period
in 2013	0,82	>=0	Business activity increase	Goodwill will increase, the total value of the company also will increase
in 2014	-0,24	<=0	Business activity decline	Decrease of the goodwill and the total value of the company
in 2015	-0,14	<=0	Business activity decline	Decrease of the goodwill and the total value of the company

From the point of investor's view, in our opinion, it is early to invest free cash in this company. So, in 2014 compared to 2013, the discounted revenue was increased by 6.6%, EBITDA was increased by 1%, while the net profit was decreased by 19%, the capital expenditures were decreased by 13%.

This situation may be due to the fact that oil prices are pegged to the dollar, revenue is recognized in rubles. Then, you may wonder why the net profit has been decreased. It is also explained by the national currency depreciation, namely, large external loans by Rosneft expressed in foreign currency.

In 2015, the negative dynamics was showed by discounted revenue (-15%) and net profit (-7%), at the same time, the capital expenditures were increased by 2% and EBITDA - by 7%. In 2015 compared to 2014, the positive dynamics is observed, but the financial highlights still have sufficiently low values and investor should not expect to seriously increase his investment.

The main criterion of the effectiveness of the company's current activity is its business activity highlights. In the long-term period, the business activity is transformed into the category of goodwill. The companies with high goodwill have more positive values of the business activity highlights.

CONCLUSION

To justify the proposed hypotheses of relationship between the business activity and goodwill, the financial highlights were considered for several major Russian companies: PJSC Lukoil, OJSC Rosneft and PJSC Uralkali, which assessment allows the investor to assess the business activity of companies in different industries in the shortest time. The analytic highlights of all the companies were included sales revenue, net profit, capital expenditures, EBITDA. We have determined their economic importance in the assessment of the business activity level, the system of universal financial highlights of business activity when monitoring of the company's goodwill was represented. The developed model was tested by us in assessing of changes in the business activity of OJSC Rosneft. The conclusions on the reasons of changes in the business activity were made, the components of the changes in the business activity were considered in the developed model, the rationality of investing in this company by a potential investor was determined.

To maintain the company's goodwill at a high level is necessary to take measures regarding to monitoring and increasing of the company's business activity (Abdul Majid, J., 2015). At the same time, these costs justify themselves many times, as the consequence of the business activity growth is strengthening of company's solvency, increasing the value of its shares, acceleration of asset turnover and overall growth of investment attractiveness. Our model has a potential for development and can be successfully used by investors to quickly assess the business reputation of the company for the purpose of long-term investment in prospective companies.

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EVALUATION OF MANAGEMENT SYSTEM QUALITY: CASE OF PROFESSIONAL FOOTBALL CLUBS

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ABSTRACT

In this paper the quality of management system of football clubs is investigated on the base of most popular financial indicators, used for assessment of company's effectiveness: brand value of football club, earnings before interest, taxes, depreciation and amortization (EBITDA) and market value of football club's shares. This is done in order to assess the impact of investments in acquisition of players' registrations to external indicators of management system quality of football clubs. The study was conducted using regression analysis in STATA package. Data comprises 22 European football clubs listed on international stock exchanges. To evaluate the effectiveness of football club's management system econometric models of brand value of football club, EBITDA and market value of club's shares were developed. As a result of the research investments in players' registrations were determined as statistically significant factor in all three proposed models of evaluation of management system quality. Thus, optimal investment in the players' registrations can be considered as a tool to improve efficiency of football club's management system.

Key Words: Accounting, Football Club, Sports Organizations, Management, Corporate Governance, Player's Registrations

INTRODUCTION

A professional sport is becoming a serious industry of economy which is on scales of financial flows comparable to many other industries of national economy.

Sports organizations today are considered not only from a position of solved tournament tasks, but also as a potential object of investment. In this regard, obtaining reliable results of analysis of sports organizations' activities plays an important role as for sports managers, who are responsible for growth of investment attractiveness of the company, and for potential investors interested in faithful assessment of financial prospects of sports organizations for the purpose of establishment of long-term economic cooperation (Monteiro Gomes et al. 2015, p.758).

In this paper the quality of management system of football clubs is investigated on the base of most popular market indicators: brand value of football club, earnings before interest, taxes, depreciation and amortization (EBITDA) and market value of football club's shares. This is done in order to assess the impact of investments in the acquisition of players' registrations on external indicators of management system quality in football clubs.

As a result of the research investments in players' registrations were determined as statistically significant factor in all three proposed models of evaluation of management system quality. Thus, optimal investment in the players' registrations can be considered as a tool to improve efficiency of football club's management system.

There are some limitations to the study. The most serious limitation is that the study was conducted on the base of small sample. Research could be developed on a larger sample, including other types of sports organizations, besides football clubs. Despite this limitation, the results are reliable as they take into account the logic of inner economic processes and mechanisms in football club and have statistically significant evidences.

LITERATURE REVIEW

Nowadays the topic of football economy is becoming more and more urgent. In the economic literature many papers are devoted to the analysis of efficiency of professional football club as business unit. The variety of tools of economic analysis provides the assessment of clubs' efficiency from different points of view.

The ability to generate income as a feature of club's effective work was analyzed in works of Aglietta, M., W. Andreff and B. Drut; Barros, C.P., A.G. Assaf and A.F. de Araujo Jr.; Guzmán, I. and S. Morrow; Jardin, M.; Soleimani-Damaneh, J., M. Hamidi and N. Sajadi and others (Kulikova & Goshunova 2014, p.117).

Football club as a full participant of stock market has been studied in works of Baur, D.G. an C. McKeating, Berument, H., N.B. Ceylan and E. Gozpinar, Jørgensen, C.W., M.R. Moritzen and G. Stadtmann, Samagaio, A., E. Couto and J. Caiado and others (Tsounis et al. 2014, p.201; Kulikova & Goshunova 2013; Rowbottom, N. 1998, p.117).

For example, Jørgensen, C.W., M.R. Moritzen and G. Stadtmann estimated multiple regression model in which dependent variable was the percentage change in the stock price of Danish football club "Brøndby" (Jørgensen et al. 2012).

Berument, H., N.B. Ceylan and E. Gozpinar studied average return of the shares of three leading Turkish football clubs – "Beşiktaş", "Fenerbahçe" and "Galatasaray". The indicators of sports efficiency were chosen as independent variables: wins in the national cup competitions, wins over foreign competitors (Berument et al. 2006, p.695).

Another study of financial efficiency in terms of market evaluation was carried by Samagaio, A., E. Couto and J. Caiado. They developed factor models for two indicators of football club's market efficiency: a) annual average return of the shares of the various clubs calculated from daily returns; and b) the equity risk of the various clubs represented by the standard deviation of return (Samagaio et al. 2009).

METHODOLOGY

The study was conducted using regression analysis in STATA econometric package. Data was collected from financial reports of football clubs for 2014 year and football statistics reviews. The sample for the investigation comprises 22 professional football clubs (performing in national championships in Great Britain, Denmark, France, Germany, Italy, Portugal, Scotland, Sweden and Turkey) whose shares are traded on international stock exchanges. Three variables were used as dependent variables:

- 1. Brand value of football club for 2014, estimated by leading international marketing agency Brand Finance (Brand finance. Football 50, 2014, p.36);
- 2. Earnings before interest, taxes, depreciation and amortization (EBITDA);
- 3. Average market value of football club shares.

Several inputs were used as independent variables:

- 1. Revenue;
- 2. Intangible assets (capitalized costs for purchase of players' registrations);
- 3. Equity;
- 4. Total costs;
- 5. Personnel costs;
- 6. Average number of playing staff;
- 7. Rank of club at the end of national championship for 2013/2014;
- 8. Number of points scored in national championship for the season 2013/2014

As a rule, brand value of company is a clear indicator of the efficiency of company management in achieving corporate goals, implementation of strategic and tactical plans.

In economic literature EBITDA is considered as universal financial indicator by means of which it is possible to estimate and compare financial performance of management of companies, which belong to various industries. In analysis of this indicator influence of company size, its debt load or applied tax regime is eliminated that allows focusing attention only on operational results and assessment of business current efficiency. This indicator is often used by external information users, in particular, investors (Alcalde et al. 2013, p.197).

Annual average market value of company's shares is also one of the reference points, which is taken into consideration in case of decision making about investing money. In this regard, it becomes important to identify whether the amount of investments in players' registrations has impact on fluctuations in market quotations of shares of professional football club.

We suppose that indicators of total expenses and equity have impact on efficiency of football club as business unit, while intangible assets (players' registrations) and personnel costs promote achievement of high sports results. Rank and number of points scored in national championship for a season directly reflect sports efficiency because it is a standard way of club's success measurement in national championship which influences on distribution of prize-winning income. Average number of playing staff is used in order to take in account clubs' wellbeing on which depends the opportunity "to contain a long bench".

RESULTS

On the base of analysis of matrix of correlation coefficients factors which have close and very close relationship with brand value, EBITDA and average market value of shares of club were selected.

Further regression analysis showed that non-linear model specification with independent variables "Investments in players' registrations", "Equity" and "Rank of club at the end of national championship" (Players, Equity, and Rank) is the best for dependent variable "brand value".

Linear model specification with inclusion two factors, namely investments in players' registrations and financial leverage, was established for dependent variable EBITDA (Players, Leverage).

At the end, log-linear form with inclusion investments in players' registrations and dummy variables, reflecting geographical origin of investigated football clubs, was chosen for dependent variable "Average market value of football club shares".

As a result of regression analysis following model of management system efficiency based on brand value was obtained:

(1)
BRAND VALUE =
$$1,316 \times PLAYERS^{0.444} \times EQUITY^{0.437} \times RANK^{0.903}$$

(1)
 $(0.208) \quad (0.045) \quad (0.043) \quad (0.244)$

In this model included factors describe the change in brand value of football club for 99,22% ($R^2 = 0,9922$). All regression coefficients are statistically significant with a probability of 95%. All these facts testify good quality of model.

The following model of efficiency of management system on the base of EBITDA was obtained:

(2)
$$EBITDA = -10,858 + 0,509 \cdot PLAYERS + 0,891 \cdot LEVERAGE$$
$$(7,200) \quad (0,087) \quad (0,364)$$

In this model included factors describe change in dependent variable for 66,07% ($R^2 = 0,6607$). All regression coefficients are statistically significant with a probability of 95%. It testifies good quality of model.

Finally, the following model of efficiency of management system on the base of average market value of football club shares was obtained:

$$CLOSEPRICE = 0,326 \times PLAYERS^{1.297} \times (3)$$

$$\times e^{-0.567 \times \text{CITALY} - 4.556 \times \text{CPORTUGAL} - 2.359 \times \text{CTURKEY} - 2.873 \times \text{CGERMANY}}$$
(1.161) (0.393) (2.300) (2.212) (1.926) (3.377)

In this model included factors describe the behavior of dependent variable only for 43,71% ($R^2 = 0,4371$). At the same time not all regression coefficients are statistically significant with probability of 95%. In particular, influence of an origin from Portugal, Turkey and Germany did not find confirmation. Nevertheless, influence of investments in players' registrations on the market stock quotation is confirmed, especially for football clubs from Italy.

DISCUSSION AND CONCLUSIONS

Interpretation and analysis of coefficients of regression models allow coming to the following conclusions:

1) Variation of brand value of football club is described by a number of factors. With increasing costs of purchased player's registrations by 1% football brand value is increasing on average by 0.44%. The increase of equity by 1% leads to the increase in brand value on average by 0.43%. This indicates positive role of club's financial stability and independence in assessment of its economic prospects. Increase of football club rank by 1% leads to the increase in brand value on average by 0.9%. This factor has the most significant effect in the model that emphasizes dependence of club's financial success on sports team effectiveness. At the same

time, high sports results are being achieved by optimal investment in players' registrations. In this regard, both factors are not accidentally included in the model as they describe the change in football brand value;

2) Value of intangible assets (investments in players' registrations) has an impact on EBITDA of football club. With increasing cost of purchased players' registrations by 1 million Euros EBITDA is increasing on average by 0.509 million Euros. The growth of financial leverage by one point increases EBITDA on average by 0.891 million Euros, which is quite logical, taking into account strong dependence on external financing of clubs as primary source of current investments;

3) Variation of market value of club's shares is described by regression model only for 43,71%. In other words, many factors were not taken into account, however, defined factor has explanatory power, is statistically significant and reliable. Therefore, we can say that market quotation of shares of football club depends on value of its investments in players' registrations. Growth in the value of players' registrations by 1% leads to an increase in market share price on average by 1,3%. Additional including of factor of origin showed that market quotation of shares of clubs from Italy, Portugal, Turkey and Germany is lower on average than in the UK, Scotland, Denmark and Sweden for 56,7%, 455,6%, 235,9%, and 287,3%, respectively. However, coefficients of variables for Portugal, Turkey and Germany are insignificant according to the t-statistics. However, F-test of the explanatory power of group of dummy variables shows the feasibility of including the country factor. Thus, the results for clubs from Italy have statistical significance.

Foreign practice has accumulated positive experience of economic and statistical methods of analysis and forecasting performance of football clubs. In this regard, the matter of particular interest is to assess whether our results are consistent with the results of researches carried out by foreign scientists in the field of professional football economy.

For example, Jørgensen, C.W., M.R. Moritzen and G. Stadtmann estimated that each gained point has a positive impact on the stock price of Danish football club "Brøndby". Thus, sports efficiency of football club in a certain degree may affect the financial success of club management (Jørgensen et al. 2012).

Berument, H., N.B. Ceylan and E. Gozpinar showed that among three leading Turkish football clubs – "Beşiktaş", "Fenerbahçe" and "Galatasaray" only for football club "Beşiktaş" relationship between the return of the shares and sports results was statistically significant and positive (Berument et al. 2006).

Samagaio, A., E. Couto and J. Caiado confirmed the hypothesis that growth of financial efficiency and investments in players' registrations had a positive impact on the market value of the football club's shares (Samagaio et al. 2009).

Baur, D.G. and C. McKeating found that stock price of football club depended on current sports efficiency - the number of points scored per game (for the national games), UEFA club rankings (for international games) and a number of related characteristics of the club (the sizes of club, League, the financial market). This relationship is positive and statistically significant (Baur & McKeating 2009).

The analysis of foreign researches shows that financial efficiency of football clubs, seeking to maximize the market value of their stocks, mainly depends on sports efficiency. Investors evaluate the investment attractiveness of club in terms of its current and expected wins, because relationship between indicators of sports and financial success is obvious, although is not always straightforward.

Thus, results of our research do not conflict with existing practice of analysis. The impact of investments in players' registrations on financial performance, in particular, football brand value, was practically not analyzed. At the same time, the fact that many researchers established connection between sports efficiency and financial success of football clubs indirectly confirms our hypothesis.

Sports performance is reached by players on the field, which are provided by investments in players' registrations. The efficiency of these investments is reflected in the higher ranking of club in national championship, which in turn affects the distribution of income from sports activity within the league. Investors, making decision to invest in the capital of football club, assess financial prospects of club. Since financial effectiveness of club management depends on quality of sports activities, the value of factor of investments in players' registrations as one of main drivers of sports performance in professional football club becomes essential for the investor.

Thus, optimal management of investments in players' registrations can become a tool to improve efficiency of football club's management system.

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THE IMPLEMENTATION OF STRUCTURAL ANALYSIS METOD FOR MANAGMENT IN EXPERT SYSTEMS

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ABSTRACT

This article reveals the problems of system-management by method of structural analysis and synthesis. The multy-agent model with the blocks, considering knowledge model in the expert system is shown. This is an original mechanism, created on the integrated model of collaboration for achievement the desired results with pre-planned indicators of its effectiveness. Expert support involved in the process of innovation at the regional level is initiated by implementing the project activity.

Key Words: The Algorithm of Structural Analysis and Synthesis of Management Knowledge Model, Decision Support Management: Expert System, The Knowledge Base, Models Of Knowledge

INTRODUCTION

In the organization we are working with complicated structures that consist of separate components that ensure the effectiveness of the structure in which they are located. The study of a complex consisting of component systems combined in a single entity has been studied for a long time by M. Mesorovith with T. Mako and Y. Takahara (Mesarović M., Mako D., Takahara Y., 1970, 294 p.; 2. M. Mesarovich, Y. Takahara, 1978, 311 p.), L. Bertalanfy (1950, p.23), A. Uemov (Uyemov Avenir I., 1998, p.173; Uyemov Avenir I., 1999, pp. 351) and others. It is being studied today and the developing now. The main tool for ensuring the reliability of functioning of each component in the complex structure is the methodology of structural analysis and synthesis.

Structural analysis has been used for a long time. Its approaches and methods of application are used not only in the technique in the diagnosis of complex mechanisms, but also in computer science at description of processes of complex information systems P. Kaloshin (Kaloshin, P. N., 1985, p.47), L. Glukhova (Glukhova, L., 2012, p.14), D. Bell (Bell, D.G., 2001 February 21) and other. Recently this mechanism has been used in the economic Science by Glukhova (Glukhova, L.V., 2006).

The process approach has been started and developing recently. It uses the methodology of the SADT by D.T Ross(D. T. Ross, 1997, p. 16), D. Levitt (Dave Levitt, 2008), D. Marca and C. McGowan (D. Marca, C. McGowan, 1987), and other, but the author's methodology of structural analysis and synthesis differs significantly from the methodology SADT and its development by Glukhova.

The purpose of the article is to represent the author's ideas about the development and usage of system approach in economics and finance. The tasks of the article are the following:

- 1. making the theoretical concepts of methodology in the structural analysis and synthesis;
- 2. suggesting the algorithm of management model based on the method of structural analysis;
- 3. projecting the multy-agent model that is supported by patent;
- 4. providing the examples of using the author's ideas in applications for economics and financial management

The current stage of modern economic development is characterized by intellectualization processes of all kinds of activity. According to the modern economic tendencies and trends, further economic growth of the country is possible due to the increased efficiency of using the intellectual component of staff, which leads to an increased competitiveness of economy as a whole. In the conditions of modern market economy the reliable and stable performance of an enterprise is impossible without the constant development and maintenance of its innovative potential. It is the innovative and information processes, the computerization and intellectualization of all levels of industrial and team activity that predetermine the intensive growth and development of the enterprise and its competitiveness at both the external and domestic markets by M. Caridi(Caridi, 1997, p.5), S. Nwana(Nwana, S.N., 1996, p.1), N. Serdyukova (Serdyukova, N., 2014).

The expert system is an organizational mechanism for an automated way to solve a problem in a predetermined area of study, based on the findings of narrow experts. Typically, expert systems are considered together with knowledge bases that represent the behavior of experts in a particular field of knowledge using procedures of logical conclusion and adoption of optimal solutions, where the knowledge base is the set of facts and rules of inference.

One of the main problems of modern approaches to the process of decision-making in support of management is the search of mechanisms which integrate easily with information technologies. In other words it is very important to use means of data processing and knowledge allowing reducing and minimizing the risks of making wrong decisions.

In the article the author's considers the issues of control and diagnostics of possible deviations of the systems process of innovation arising from of incorrect actions of personnel and management. This formed the expert knowledge base, containing a set of rules on different scenarios. The considers the formalization algorithm of monitoring parameters management model with method of structural analyses that provides state of the economic homeostasis for the structural system in terms of the dynamics of its development.

THEORY

The methodology of structural analyses and synthesis. Here is the author's approach by Glukhova. We introduce the basic definitions of the methodology.

The integrity of the system is an integrative property that is defined by only a significant indicator of the overall system. It determines the structure of the system and its internal unity.

An attribute is a property of integrity and its structure, without which the system cannot exist.

The structure displays the immediate relationships of the system elements that reveal the content and nature of these relationships between themselves and with the system as a whole.

The structure is considered together with one of the criteria of the system. Further, as a criterion we will consider the efficiency.

Structural system analysis is a method of sustainable researches the inner workings of the system. It allows you to justify the mathematical model of the structure, knowing its components and requirements to the level of quality of its activities. Structural analysis ends with a build configuration structure.

The necessary and sufficient characteristics of the system are the signs of objectivity, relativity, attributively. They allow us to describe the three sides is an integrative property of the integrity of the system.

Let's consider them in more details.

- 1. Subject symptom system, is usually a system in the form of its parts to their functional purpose. It can be hierarchical or functional diagram of the system. It vividly displays the interaction of the parts and the whole.
- 2. Relative symptom (R_i) displays part of the system through relations of the main parameters essential properties of each part to the same property of the system as a whole. This gives the opportunity to examine the system through an abstracted form of its relations, which are denned as the indices of system structure. The indices of the structure (or relationships) associated parts of the system with the system as a whole. For example, denote the parameters of the system through the symbolism:

 (π_i) – the controlled variable of the system;

 $(\pi_{\rm kp})$ - is the dimensionless parameter of the system;

The index of the influence of the structure of the system is calculated by the formula (1)

$$R_i = \frac{\pi_i}{\pi_{\kappa p}} \tag{1}$$

All parts of the system are presented in the structural analysis of the decreasing number of indices R_i determine the relative sign of the relationship in the form of (2):

$$R_{1} \ge R_{2} \ge \dots \ge R_{i} \ge 1 > R_{k} \ge R_{k+1} \ge \dots \ge R_{m-1} \ge \alpha > R_{m} \ge R_{m+1} \ge \dots \ge R_{n-1} \ge R_{n} > 0$$
(2)

3. The attribute symptom means for formation of patterns ($S\{P_i\}$ the symbol structures).

In the author's vision is a set of equal sums of indices of structural blocks with a sign $(\sum R_i \cong 1)$ that reflects the minimum possible system risks. The structure must comply presented external environment requirements (γ) the efficiency of the system. The author proves that these requirements in a structural analysis inevitably leads to a mathematical justification of the best-possible configuration of the structural scheme given the properties of integrity, determined by descending number of indices. Figure 1 shows the approximate form of the structural scheme of the integrity of the system constructed on the basis of necessary and sufficient characteristics of the system.

Figure 1 GENERAL VIEW OF THE STRUCTURAL SCHEME



The figure shows that in the description of the structural scheme can be blocks combined in series, parallel or mixed connection type. The formula 3 considers the obtained structural diagram of the mathematical relationship formed on structural formula, reflecting systems attributiveness.

$$P(\Delta < \Delta_{H}, \mathbf{T}_{H}) = P_{1}P_{2}...P_{i}P_{i+1}...[1 - (1 - P_{m-1})(1 - P_{m})]$$
(3)

The synthesis system can be described by the formula 4.

$$P(\boldsymbol{\mathcal{T}}_i \ge \boldsymbol{\mathcal{T}}) = \sum_{i=0}^{s} \{P_i\} \ge \frac{\gamma}{100},\tag{4}$$

where γ – the probability of providing a significant criterion of the considered system properties, expressed as percentage.

Methods of structural analysis can be viewed in a variety of applications. For example, to control expert systems.

The expert system consists of the components: The user interface; The user; Intellectual editor of the knowledge base; Expert Engineer knowledge; Working memory; Knowledge base; The output mechanism solutions; The subsystem of explanations.

The management model is built on the basis of the structural analysis shown on figure 2.

Figure 2 MANAGEMENT MODEL BASED ON THE METHOD OF STRUCTURAL ANALYSIS



The multi–agent information system is studied and suggested as a tool for effective running of the innovative activity and performance of modern enterprises by Glukhova.

Next, consider the process of management of individual components of an expert system consisting of a block of a multi-agent system.

The task of multi-agent system is a dynamic distribution of information between agents of market relations and making them to be capable to communicate with each other and to influence the field of innovation, supported by government financial flows.

Nowadays the remote monitoring with means of computer technology and visualization of the processes of collective managerial work can be used to diagnose promptly the adequacy of managerial decision-making due to the monitoring of key indicators.

The multi-agent system is considered to be effective support for management and decision making by Glukhova. The figure 3 represents the multi-agent based on the expert system.

The basis of knowledge of the expert system model by E. Post and M. Wooldridge (Wooldridge, M., 1995) is the set of production rules, which are developed by experts and are used in those areas, which are inherent in the occurrence of risk situations. The model is based on the logic of system of rules of the form "If..., then..." and provides a way of presenting findings, recommendations, guidelines, strategies.

The dynamic feature of expert systems is their functional binding to changes in the external environment, therefore, data processing and decision making are carried out in real time,

and the systems themselves are self-learning in the process of "trial and error" decision. This new knowledge is then used in further work.



Figure 3 THE MULTI-AGENT SYSTEM MODEL

Naturally, the most important role in this adaptation process knowledge belongs to diagnosis and monitoring as tools of modern management that enables to block the noise components of the management processes that can bring the system out of a state of economic homeostasis. To assess the effective use of financial resources evaluation indicators are required to diagnose performance budgeting. These functions in the proposed multi-agent information management models are provided with mechanisms for the integration of methods of structural analysis and synthesis with a new formalization of the theory of systems by selecting scenarios of managerial policy.

RESULTS

Figure 3 represents the multy-agent information system used to support the decision making of the State Financial Management. The purpose of the support is getting the dynamic distribution of information between different agents at the market place. The agents must be adapted for decision making in conditions of uncertainty. Table 1 represents the mechanism of adaptation and self-study achieved by using the expert system.

Table 1
THE MECHANISM OF ADAPTATION AND SELF-STUDY IS ACHIEVED BY USING THE EXPERT
SYSTEM

Description of module	The purpose of the module	The Expected result
	The core is used for monitoring and diagnostics of	
	possibility of managerial errors.	Expert database
The Core of monitoring	It includes 7 modules used to collect the situations of non-	containing the rules
and management (the	stability and risks. It contains database and rules to manage	for corrective activity
core № 6)	the models according to the scenario of development and	and risks statistics
	economic homeostasis	

Generated model management, comparable to the selected scenario will be in a state of economic homeostasis at the expense of calculated quantitative indicators, linking targets external and internal environment.

Next we will describe the mechanism of remote support decision making on the basis of the module of the expert system. We will use a new formalization of systems by N. Serdyukova (Serdyukova, N., 2014), who proposed the integration of mathematical methods of algebra groups and the methodology of structural analysis and synthesis by L.Glukhova (Glukhova, L., 2012, p.14).

Decision support management of the modeling is based on the methods structural analysis and synthesis. In the model of multi-agent systems each core performs its functions.

The core number 2 is designed to generate economic homeostasis. It is the calculation of output control signals for block number 6. Control signals pass normative sustainability indicators. The system output for limit values leads to a violation of a condition of economic homeostasis. For this purpose, the core 2 uses methods of structural analysis and synthesis.

Their application allows calculating by probability theory and support collaborative works solutions of each of the blocks of the system. Then support the decision-making processes will be effective. Moreover, with the changing demands of the external environment, this kernel also describes the structural model of achievement of the internal environment requirements of the external environment.

External environment that defines the requirements for quality, innovation financing, is defined by:

- 1. The Ministry of Finance of the Russian Federation;
- 2. The Ministry of economic development of the Russian Federation;
- 3. Investment Fund of the Russian Federation;
- 4. Regional investment funds and others.

This part of the authorities and consumers of financial support for innovative projects put forward a variety of on the specifics, content and requirements for quality and competence of staff responsible for financial flows. To meet the requirements of the external environment, implemented in the proposed system was created model of knowledge, for an adequate control and remote support performance of scenarios budgeting.

Consider the initial stage of implementation of the core 2.

Let the Mission of the external environment "the development of the budget process for the selected scenario (let's denote it by item number 1), involves the solution of two problems with numbers 1.1 and 1.2.

For example, suppose the task is formulated as:

1.1 creation of new knowledge relevant to the current budget process;

1.2 formation of the resource base provide budgeting innovation.

Let the probability (γ) ensure Mission (1) is defined at the level of 99%.

As for the implementation of the mission (1) it is necessary to solve two problems (1.1 and 1.2), the structural model parameters required efficiency (E_{mp}) support the chosen scenario budgeting, will be:

$$P(E \ge E_{mp}) = P_{1.1} \cdot P_{1.2} \ge \frac{\gamma}{100},$$
(1)

where:

 $P_{1,1}$ – the probability of efficient solutions of the problem 1.1;

 $P_{1,2}$ – the probability of ensuring the effectiveness of the solution of problem 1.2.

Assuming γ =99% and assuming that the probability of both tasks are equally important for achieving the mission, get (formula 2) that with probability 99.5% should be the decision of each task.

$$P(E_{zp}) = P_1 \cdot P_2 \ge 0.99,$$

$$P_{1.1} = P_{1.2} = \sqrt{\frac{\gamma}{100}} = \sqrt{0.99} = 0.995$$
(2)

where:

Continuing to refine the decision-making process to achieve the main goal (mission), you can build a fairly complex hierarchy, in which all causal links will be provided quantitative values, reflecting the role of each system component.

In the table 2 a portion of the joint core 2 and core 6 for the identification of regulatory indicators of completion of the tasks are described and represented.

Table 2
THE EXAMPLE THE IDENTIFICATION OF REGULATORY INDICATORS OF COMPLETION

Purpose	(γ),%	Tasks	(γ),%	Subtask	(γ),%
The development of the budget process for the selected scenario	99,0	1.1 creation of new knowledge relevant to the current budget process	99,5	1.1.1 the development of the core knowledge base and the formation of knowledge content	93,0
				1.1.2 development of new rules script budgeting	93,0
		1.2 the formation of the resource base provide budgeting innovation.	99,5	1.2.1 support financial attractiveness for investors in innovation	95,9
				1.2.2 providing financial attractiveness for market innovation	95,9
				1.2.3 the formation of resource material-technical and technological base	99,8
				1.2.4 the formation of the human resource component	99,8

Thus, the calculated standard indicators of model of economic homeostasis which is the management scenario of budgeting and providing the efficiency and risk less achievement of the target.

CONCLUSIONS

Nowadays the Expert systems are being developed. This is evidenced by the State policy which is aimed to the knowledge intellectualization. Modeling knowledge is a part of the activities of expert systems. Components of the expert system are connected among themselves by a certain structure. It is important to make each component of the structure work with the set of reliability level. In the development of knowledge models one of the problems is the evaluation of the correcting the managerial decision-making using expert systems.

Decision support management of the modeling is based on the methods structural analysis and synthesis. In the model of multi-agent systems each core performs its functions. Their interaction takes place in the triad: the super-system, system, subsystem. The role of the state is reflected in the unit of the external environment. The obtained results prove the methods and mechanisms introduced to be effective and serve as key factors for system management.

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THE FORMATION OF THE SYSTEM OF PRIORITIES OF THE CLUSTER POLICY OF THE REGION

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ABSTRACT

This article presents an analysis of approaches to the identification of the territorial cluster and supporting the development of territorial production clusters. We found significant differences between the approaches to defining priorities for development in the area of the clusters. There are also differences in the way support clusters that depend on the parameters of cluster development, market orientation and the level of maturity of the cluster. Presents the concept of regional support cluster initiatives to identify the most priority to support clusters.

Key Words: Region, Industrial Cluster, Measures to Support Cluster Development, Clusters, Cluster Initiative, Cluster Policy Priorities

INTRODUCTION

For development of economy of region it is necessary to use such form of organization and cooperation of labor, which would ensure the accumulation and effective use of resources of the territory. Such forms may include clusters.

According to Michael E. Porter "clusters are geographic concentrations of interconnected companies and institutions in a particular field" (Michael E. Porter, 1998, p. 7) that compete and collaborate at the same time.

Clusters are networks of interacting companies, R&D institutions, universities and other relevant stakeholders whose activities result in the generation of new knowledge which translates into new products and services as well as innovations in processes, organizations and markets. According to (Porter, M. E., 1998), the local competition creates incentives to emulate best practice and boost pressures to innovate, while also connecting the strengths of competition with the virtues of selective cooperation. The concept of clusters was related to the "competitiveness" of industries and of nations. In a similar vein, van Dennerg and colleagues define clusters as "local or regional dimension of networks" (Van Dennerg, L., Braun, E., & van Winden, W., 2001, p.186).

Currently clusters are formed at the level of a region or entity of any system. As world practice shows, the initiators of cluster policy may serve as the Central management bodies that carry out cluster policy "from above" and the regional government or local business associations offering programmes to stimulate the development of clusters bottom-up. Such programs are called "cluster initiative", which is defined as organized efforts to increase growth and competitiveness of cluster within a region, involving cluster firms, government and research institutes (European Commission, 2006).

Clusters are not necessarily limited to administrative or geographical boundaries, but they have a geographical centre. The benchmarking of 143 cluster organizations in seven European countries in the context of the NGP Excellence project has shown that typically 75 to 95 per cent of the cluster participants are located within a distance of 150 kilometers from the cluster

management organization, which can be considered as the "node" of the cluster (Figure 1) (Lämmer-Gamp, Thomas/Meier zu Köcker, Gerd/Christensen, Thomas Alslev, 2011, p. 21).

Figure1 GEOGRAPHICAL CONCENTRATION OF CLUSTERS IN DIFFERENT EUROPEAN COUNTRIES



This proves that the support and development of clusters associated with the development of the territories therefore, cluster policy should be part of regional economic policy. Thus, the success of cluster development depends on the work cluster management organizations.

Key conditions for growth include the existence of linkages across cluster participants, the transformation of public into private science, the commercialization of new knowledge and the mobility of people to transfer knowledge and patterns of thinking between industry and the research sector. The growth has to be supported by a policy and program framework that creates conducive framework conditions and supports joint projects of the cluster participants (Sölvell, Örjan, 2009, p. 55).

Successful implementation of projects promotion of clusters possible in the presence of the regional strategy. When developing a regional strategy should address the key growth areas of the region as a whole.

METHOD

In the last decade, the study of the principles and mechanism of functioning of regional clusters is one of the most important and demanded areas of economic research worldwide.

The researchers of this problem under the economic cluster understand the concentration of similar, connected or complementary companies, which are characterized by the active interaction and transaction and are in dialogue, finding solutions to common problems.

They share a common infrastructure, labour market and services (Bergman E. M., Feser, E. J., 1999), including, companies in the cluster have equal access and use the products and

services of the financial market. As a result, the cluster contributes to economic growth, as each participant and the region as a whole.

It is possible for the following reasons:

- 1. clusters increase productivity because of access to resources, information, and institutions;
- 2. clusters increase the share of innovative products due to internal competition;
- 3. clusters accelerate the production process, attracting new firms and institutions;
- 4. clusters are doing more understandable and predictable business environment in the territory, thus improving the quality of regional strategic planning.

While there is an ongoing debate about how to identify and determine the degree of formation and boundaries of the cluster. This is the starting point of the analysis of the factors of cluster development, including identification of a set of measures to support the cluster.

Many scholars have promoted the idea of diversification methods for the identification of the cluster, depending on the level of analysis – national level, sectoral level and regional level (Solvel, O., Lindqvist, G., Ketels, CH., 2006).

In these works one can distinguish two groups of methods:

- 1. qualitative methods
- 2. quantitative methods

Among quantitative methods for the identification of a cluster can be identified:

- 1. the coefficient of localization (localization coefficients LQ),
- 2. analysis of supply chains (input-output analysis),
- 3. dynamic structural analysis (shift-share analysis),
- 4. Giniho coefficient of localization,
- 5. Ellison and Glaeser index of agglomeration,
- 6. Maurel-Sédillot index.
- 7. The best-known qualitative methods include:
- 8. survey of experts and management of companies (interviews with experts and management of the firms),
- 9. questionnaire surveys (researches question-forms),
- 10. situational analysis (case studies).

Localization coefficients compare the characteristics of branches (number of employees, sales and added value) at the regional and national level. The results of the LQ show the dominant localization of enterprises in the given branches (Solvel, O., Lindqvist, G., Ketels, CH., 2006). The localization quotients for the number of employees is defined as follows

$$LQi = (zi/z) / (Zi/Z) (1)$$

(1)

where:

LQi is localization coefficient of the i-th branch (employees), zi is the number of employees of the i-th branch in a region, z is the total number of employees in the region, Zi is the number of employees of the i-th branch in country, Z is the total number of employees in country. LQiv = (vi/v) / (Vi/V) (2)

where:

LQivis localization coefficient of the i-th branch (turnover, value added) vi is the value of output (turnover, value added) of the i-th branch in a region, v is the value of output in the region, Vi is the value of output (turnover, value added) of the i-th branch in country, V is the value of output in country.

In determining the priority clusters in the regional industry, which will be given priority and support by the state, it must be assumed that the main purpose of state regulation of the investment process is the achievement and maintenance of a rational structure of the regional industrial complex (RIC), providing conditions for sustainable, progressive and integrated development of the region.

Therefore, for the selection of priorities of the cluster policy needs to be conducted functional analysis of the structure of the regional industrial complex (RIC) aimed at identifying the need and defining the directions of its rationalization.

As part of this analysis calculated indices of specialization, resulting in all branches of the RIC are divided into three groups:

- 1) Industry specialization (base), which are the basis of the regional industrial complex;
- 2) Supporting industries (their development is coordinated with the development of basic industries);
- 3) Service industry (local) that meet the needs of the region's population.

The backbone of the economy of each region is the branches of specialization with a high coefficient of localization. The clusters in these industries determine the stability of functioning and development of all other industries in the region. Therefore, you first need to make a study of the structure of regional production specialization, aimed at the assessment of their rationality and prioritization of cluster policy

It must be conducted the following study:

- 1. an estimate of how the development of this production enhance the stability of the profits of a RIC;
- 2. how much increased production and profits;
- 3. estimated increase in the number of jobs and incomes due to the development of this production.

In addition, to achieve a rational structure of the industry in the region, it is necessary to provide in its development a certain level of complexity.

RESULTS

The Republic of Tatarstan is a vivid example of development of cluster strategy of regional development. Research on natural resources-based clusters suggests that co-located firms in regional clusters exhibit high levels of inter-firm cooperation (Felzensztein, C., Gimmon, E., & Carter, S., 2010, p. 675).

Development of innovative economy of Tatarstan Republic is possible on the basis of creation and development of the cluster approach in the management of economic processes.

Clusters reflect specializations of regions in activities within which companies can gain higher productivity through accessing external economies of scale or other comparative advantages (OECD, 2009, p. 26).

In this regard, today in the Republic of Tatarstan you can select multiple clusters:

- 1. car location Naberezhnye Chelny, the anchor company of JSC "KAMAZ";
- 2. refining, petrochemical industry with the territorial affiliation of Nizhnekamsk and the anchor company OAO "Nizhnekamskneftekhim";
- 3. power with territorial affiliation Kazan and the anchor company of JSC "Tatenergo".

In addition to the generated clusters in the Republic of Tatarstan there are long-term, which include construction, agricultural and IT-cluster. These clusters are gradually evolving but there are various problems that hinder development. For example, in the construction cluster there is no anchor and no enterprise labor resources, therefore, the coefficient of localization is less than 25%. In the IT cluster is another problem that no appropriate labor resources for development of this sector. At the lowest level of development agro-industrial cluster, where in addition to Industry University nothing and therefore it is most difficult to develop. In this respect, it is necessary to create cluster option "top-down", where the cluster development strategy should propose the authorities, through the creation of special organizations for the management cluster.

The main strategic goal of the Republic of Tatarstan is to change the existing model of economic growth: from oil to innovation-based growth. In this regard, the government constantly supported the most important innovative processes, including the efficiency of the economy.

Based on the foregoing, we can suggest the following method of determining priority directions of the cluster policy of the region:

Stage 1.

- 1. Identifying sectors of regional specialization of industrial complex;
- 2. The division of all industries in these sectors into groups, fluctuations in which profits are determined by the same factors, therefore, these fluctuations have the same direction (related production; production, operating in one territorial market; production working for one user, etc.);

Stage 2.

- 1. Determining the proportion of each group of industries in total industrial production of the region and profits and their ranking;
- 2. Assessment of the likelihood and the possible amplitude of oscillation of the profits in the production of this group;
- 3. Assess impacts of possible market fluctuations of profits in the production of a selected group on the total profit in the industry;

Stage 3.

- a. Determining the structure of the branches of specialization of RIC, providing sustainable development of the region the balance of production, fluctuations in which profits are determined by unrelated factors;
- b. Define indicators of the development of sectors and industries, ensuring the achievement of this structure.

CONCLUSION

Thus, as a priority for support measures for clusters are determined, the level of profit which does not depend on the factors determining fluctuations profit productions, selected at the 2nd stage. This production will help improve sustainability of profit RIC and thereby to the stability of budget revenues of the region.

In addition, to achieve a rational structure of the industry in the region, it is necessary to provide in its development a certain level of complexity.

You can offer as an indicator of the level of complexity of regional industries, the relationship between the demand of households in the region and supply the local production, defined by the following formula:

$$K = G/D$$
,

where:

K - level complexity of RIC;

(3)

G – volume of production of consumer goods in the region serving (local) industries;

D – consumption industrial production of the region's population.

Thus, the Government of the Republic of Tatarstan, we propose to use the following indicators (Table 1).

Table 1DEVELOPMENT INDICATORS SUPPORTING ENTERPRISES OPERATING IN THE LOCAL
CONSUMER MARKET OF THE REPUBLIC OF TATARSTAN

The name of the indicator	The threshold value
<i>K</i> (<i>t1</i>) - the level of complexity of industry of the Republic at the end of period T	>= Kmin (t1)
G(t1) – the production volume of consumer goods production group M at the end of period T	>= <i>Gmin(t1)</i>
 <i>Gi(t1)</i> -the production volume of product i at the end of period T including, production volume sub-industries: - woodworking industry; - building materials industry; - lightindustry; - food industry 	>= Gi min(t1)

In turn, depending on the desired rate of growth of the underlying industries associated with this growth of household income and prospects of increasing domestic consumer demand, determined the need to develop service industries. On this basis, will identify priority clusters, due to the need of integrated development of RIC (Gabdrakhmanov N.K., 2014, p.393).

Earlier we found that on the territory of the Republic of Tatarstan there are two main clusters, havingdifferent relationship with financial institutions: energy and petrochemical clusters. In the energy sector pricing tariff and regulated by the state. The petrochemical sectors are more closely related to financial institutions and active use of modern financial instruments.

We also shure that the experience of functioning of the Russian and foreign capital market confirms the emergence of new prerequisites of the banking and industrial integration in connection with the transition to a qualitatively different level of globalization and internationalization of the economy.

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UPGRADING CORPORATE EQUIPMENT AS AN ASIAN REAL OPTION

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ABSTRACT

A method for handling the problem of financial mission statement has been suggested to evaluate effects of projected upgrading equipment of a manufacturing company. For this end, such project is analyzed as an Asian real option with constant business volatility. The problem is solved using the Black-Scholes model, a refined and modified binomial model and a modified trinomial model. It has been demonstrated that the most accurate valuation of the option and the entire project in general is provided by the trinomial model. Also this paper establishes a degree of influence between an inflation rate and a risk-free investment rate on the precision of estimated value of an Asian real option. It has been shown with an example that in the event of advancing by the inflation rate beyond profitability of risk-free investments, which is typical for Russia, an option valuation in a trinomial lattice will be lower than that in a binomial lattice. The result serves a useful purpose for analysts considering the fact that a trinomial model is a more accurate discrete model than a binomial model.

Key Words: Upgrading Equipment, Real Option Valuation, Asian Option, Constant Volatility, Binomial Model, Trinomial Model

INTRODUCTION

At present time, the technological progress to a large extent determines improvement of living standards of the community. But at the same time, it is important to understand processes of implementing technical and technological innovations into human social activities, primarily in the area of social economic development. In such a manner, economic implementation of technological innovations on a first-priority basis at leading and developing companies in many respects predetermines successful economic performance of the country, which has a direct say in improvement of living standards of the population.

In this connection, creating corresponding economic and financial techniques for successful implementation of technological innovations is one of the top-priority goals of manufacturing companies. One of such trends includes a theory and practice of real options that have been already used in business for a long period since the time when stock market option technologies were for the first time adapted to manufacturing requirements. The term 'real option' it was introduced into financial science by Stewart Myers (Myers, S. C., 1977, p. 147). From then onward, the concept 'real option' has been seriously progressing having developed

both into a separate global scientific field and into quite a broad sphere of practical application in business.

Despite a broad coverage of different business lines with real option techniques, this method of financial analysis and strategic planning already boomed as far back as 1990s. At present, many web-sites dedicated to real options, such as www.real-options.com, look like frankly languorous, and only some of them, such as www.realoptions.org, continue conducting serious surveys in this area, but already in a fully scientific field using for this purpose the stochastic financial mathematics instrument with increasing frequency.

In its issue dated August 14, 1999, The Economist journal delivered the following viewpoint on its traditional page Economics Focus: real options will be able to obtain a wide circulation in practice unless and until most managers hold a doctorate in applied mathematics. However, due to exactly real options, many leading global companies managed to be greatly in advance of their competitors in business significantly increasing their market capitalization. Perhaps, the most shining example of this includes Amazon.com that was in due time even called 'cold table of real options' (Roche, J., 2005).

To our opinion, a reasonable understanding of this problem should imply a progressive perception of true requirements and missions of economics in general and business in particular (Cox, J., S. Ross and M. Rubinstein, 1979, p. 229). Thus, for instance, already for a long time, instruments used by businessmen and financial analysts in their work include computer resources support, which greatly accelerates processes of taking managerial decisions. For example, building a simple linear regression for predicting any economic indicators can be now done almost in any software program, including in MS-Excel. Naturally, no one will ever try to do this manually if there is a computer at hand. Another example of this includes the use in financial calculations of linear and integer programming that is necessary for certain investment missions. Nevertheless, the theory of these methods itself implies deep studies in applied mathematics.

For real options, there are also appropriate software packages enabling quite easily to enter basic data into a program and quickly obtain a final result in the form of an eventual figure meaning, for example, the real option value, which then may be, for instance, added to NPV of an investment project. Such procedure already makes no businessman or analyst feel uneasy since it is elementary (Haahtela, T., 2010).

However, the use of real options in practice of doing business should not be satisfied by this. To our opinion, there are two reasons for that.

- 1. Many scientists, such as Roche (Roche, J., 2005), fairly believe that real options are associated with many purely technical problems of financial nature, which should be primarily attributed to the fact that a considerable number of companies prefer to have real options at their disposal, but not to exercise them at the same time. This leads to unjustified overvaluation of investment and innovation projects that may in reality turn out to be even unprofitable. This adversely affects future marketable value of such a company.
- 2. The principle of real option building and analysis itself should focus its attention primarily on placing financial tasks, because incorrectly formulated investor's objectives will clearly lead to erroneous and, therefore, ineffective management decisions. A correct understanding by an investor of what it wants to get out of business is much more important than the mathematical methods themselves for the solution of standard tasks in many ways. Simply put, a correct statement of a problem is already a half-solved problem.

Taking into account the above reasons will contribute to moving the primary focus onto a more adequate building of the real option in order to solve the task of upgrading the company

equipment. And only after that, it will be possible to select the most optimal method of valuating the option.

THEORETICAL SUBSTANTIATION OF THE ISSUE

A real option for equipment upgrading is a classical 'option for future development' (Limitovskiy, M. A., 2008). While analyzing future development prospects, the value of an option is usually added to the business or project value determined according to the traditional DCF technology. Capital investments in development (expansion, experience replication) are used as the strike price K. The present value of basic asset S_0 is a current valuation of cash flows that are generated by business (quite often, it is less than the strike price). The time t in models as applied to real options is a period during which it is possible to take a decision on business expansion.

As an illustration of a reasonable task for estimating the value of a real option (a ROV task), we will consider an equipment replacement project at a hydrogeological well-drilling plant (Limitovskiy, M. A., 2008). We will consider the same example in future to compare different methods of solving the ROV task.

Thus, LLC Vodyanoi provides services to gardeners' partnerships in the Moscow Region for drilling water wells. All in all, LLC Vodyanoi has on the books ten drilling rigs operating at different sites and in different areas of the region. The company director is considering a possibility of substantial upgrading of the drilling rigs, which would contribute to reducing operating expenses, increasing the equipment productivity and, accordingly, procuring more orders from potential customers. In order to handle the designated mission, the company management decided to carry out a feasibility study of the upgrading project.

Let us introduce basic data for calculations according to the most likely case of developments per one drilling rig (Table 1).

Indicator Name	Indicator Value		
	Base Case	New Equipment	
Productivity, m/machine-shift	8.1	12.2	
Equipment utilization ratio by time	0.5	0.5	
Average number of shifts per year	304	304	
Average price of one drilled meter, USD	22	22	
Average operating expenses per machine-shift, USD	123.4	96.1	
Net capital costs, including procurement of new rigs less net salvage value of old rigs, USD	-	20,000	

 Table 1

 BASIC ECONOMIC DATA FOR CALCULATIONS PER DRILLING RIG

The project includes no additional costs and benefits associated with growth of working capital. The equipment rate of depreciation is 20%; at the end of a five-year period, the net value from retirement of equipment is equal to zero.

All calculations were carried out on a real basis – in a fixed scale of prices. The basic financial data for calculations is given in Table 2.

Table 2
BASIC FINANCIAL DATA FOR CALCULATIONS PER DRILLING RIG

Indicator Name	Indicator Value (% per year)
The company WACC in real terms	12
Risk-free interest rate	4
Income tax rate in the Russian Federation	20

Calculations carried out by the financial director according to the conventional technology show inexpedience of upgrading any drilling rig, not to mention ten drilling rigs. Each of the projects reduces the wealth of owners by 1,511.25 USD, which is a considerable amount for this company.

At the same time, the director has great doubts about the calculation results connected with the accuracy of predicting cash flows. The issue is about that uncertainty, which is borne by the basic assumptions regarding:

- 1. the number of orders and related operating expenses per one drilled meter (saving on semi-constant expenses is possible) and the equipment utilization ratio;
- 2. faultless performance of new equipment and repair frequency;
- 3. average depth of drilled wells (payment is made not for meterage, but for the result of drilling, i.e. the number of productive wells) and others

As a result, the efficiency calculation accuracy has the mean-square deviation $\sigma = 40,33\%$ (mean-static σ (%) in USD for the machine-building industry) (Limitovskiy, M. A., 2008).

In order not to lay down the entire business at stake in general and to obtain more accurate information on the project results, the director of LLC Vodyanoi decides to conduct an experiment: despite the negative calculation results, to carry out upgrading of one of the drilling rigs. If the result turns out to be successful (which will be clear within a year), this experience may be repeated for the other nine rigs.

There remained, however, an open question: whose position was more reasonable in such situation, the director's or that of his deputy in charge of finance?

Thus, the pilot project provides us with information on what may happen to the following nine projects and reveals the uncertainty. As a matter of fact, it confers entitlement to investing money in the nine similar projects within a year under favorable circumstances (in case of a positive result of the pilot project). This entitlement represents a call option for 9 projects (or 9 options, each for 1 project).

On top of everything else, it should be noted that cash assets depreciate with the lapse of time even for a period of one year. Such problem is particularly topical for developing markets, including Russia. However, since the financial calculations are made in US dollars, it is required to consider in future calculations the inflation rate of exactly US dollar, which has been averaged to 3% per annum for the last years. With this factor in mind, the strike price will be K = 20,600 USD in a year. Consequently, we come to an Asian option model, i.e. an option with a variable strike price (in this case, based on the inflation rate).

The underlying problems relating to the use of the Black-Scholes model (OPM) to valuate real options include as follows:

- 1. OPM includes σ of contract profitability, which is not possible to predict accurately.
- 2. If σ is predicted by experts, there appears a problem of reliability of the prediction.
- 3. OPM is only applicable to European options.
- 4. OPM was created for conditions and restrictions of a stock market.

The first problem is particularly topical for developing markets, including Russia. We are going to solve it switching to financial calculation in US dollars. Therefore, we can use, as we mentioned previously, the mean static σ (%) in USD for the machine-building industry. With a view to even greater specification of calculations, we can also adjust it for the project implementation conditions existing in Russia. But such adjustment itself also bears an uncertainty that is again very difficult to evaluate accurately. In this case, there is one of the basic principles of evaluating volatility, which is used in stochastic financial mathematics, namely, the principle 'volatility is volatile in itself' (Bastian-Pinto, C., L. Brandão and L. Ozorio, 2012, p.28).

The second problem is also associated with the project implementation conditions in Russia. Here, expert evaluations are also notably volatile.

The third problem makes even more serious impact on the reliability of estimating the value of a real option since in reality; we understand that we can exercise it when we need it (within an option period under review). Therefore, it is more reasonable to analyze an American option. However, as is pointed out by many authors, such as Limitovskiy (Limitovskiy, M. A., 2008), in this case, OPM may be applied for conservative estimate of an American real option, i.e. the price of a European option is a lower limit for the price of an American option having the same terms of issue.

The fourth problem is perhaps the most serious one, but it may be approximately solved using the same method that was used for the third problem.

The formal OPM formula developed for valuation of a premium under a European call option (Black, F., and M. Scholes, 1973, p. 637) looks like this:

$$C_0 = S_0 N(d_1) - K e^{-rT} N(d_2);$$
(1)

$$d_{1} = \frac{\ln \frac{S_{0}}{K} + \left(r + \frac{\sigma^{2}}{2}\right)T}{\sigma\sqrt{T}};$$

$$d_{2} = d_{1} - \sigma\sqrt{T},$$
(2)
(3)

where C_0 – current price of call option;

 S_0 – current price of basic asset (it is expected that the asset brings no current income, i.e. dividend or coupon);

K – strike price;

r – continuous yearly rate of risk-free return (growth power);

T – time to exercise of option (in years);

 σ - mean-square deviation of basic asset price per year;

N(d) – cumulative normal distribution function.

Please note that σ in the example under review does not change due to a short period of the real option – one year. Consequently, we will valuate an Asian real option with constant business volatility. Let us do this in Table 3 according to formulas (1)-(3).

Parameters and Indicators	Parameter and Indicator Values
Number of options in project	9
S_0 for each option, USD	18,488.75 (PV of project cash inflows)
K for each option, USD	20,600 (investments)
r	0.04 (continuous risk-free rate)
T	1 (option period – 1 year)
σ	0.4033
d_1	0.029678
d_2	-0.370322
$N(d_1)$	0.511871
$N(d_2)$	0.355581
C_0 , USD	2,426.1
Option project NPV, USD	2,426.1×9-1,511.25 = 20,323.67

Table 3 VALUATION OF AN ASIAN REAL OPTION WITH CONSTANT BUSINESS VOLATILITY USING OPM

Consequently, the director of LLC Vodyanoi was right: despite the apparent inexpedience of upgrading, the experiment is fully justified.

With a view to specifying ROV calculations in our example, it is required to solve the remaining two problems that we had in the Black-Scholes model (OPM):

- 1. OPM is only applicable to European options.
- 2. OPM was created for conditions and restrictions of a stock market.

They may be solved using in calculations, for instance, a binomial model slightly modified by us (Koshelev, E., Y. Trifonov and S. Yashin, 2012; Trifonov, Yu. V., S. N. Yashin and E. V. Koshelev, 2011, p. 2). The first modification consists in changing the strike price of a real option in a certain period of time, depending on the inflation rate for the corresponding number of elapsed periods. The second modification consists in a practical opportunity to trace time moments beneficial for early exercise of the real option, i.e. in identifying nodes of a binomial tree where the price of a 'dead' (exercised) option is higher than that of a 'live' (non-exercised) option.

With a view to more accurate simulation with a longer time interval Δt , a binomial tree may, according to the viewpoint of Jabbour, Kramin, Young (Hull, J., 2006) and Hull (Jabbour, G., M. Kramin and S. Young, 2001, p. 987), be derived in accordance with the following equations:

$$u = e^{\sqrt{e^{\sigma^2 \Delta t} - 1 + r \Delta t}}; \tag{4}$$

$$d = e^{-\sqrt{e^{\sigma^2 \Delta t}} - 1 + r\Delta t};$$
(5)

$$p = \frac{e^{r\Delta t} - d}{u - d}.$$
(6)

Using model (4)-(6) for $\Delta t = 0.25$ year, we obtain the following parameterization in the example under our review:

u = 1.236169; d = 0.825293; p = 0.449666; 1 - p = 0.550334.

The result is that based on the values u and d, we obtain a binomial tree for modifying the value S_t of the basic asset (PV of pilot project cash inflows) in US dollars (Figure 1). In the same figure, let us show changes in the strike price (K_t) as per quarterly inflation rate $i = \sqrt[4]{1.03} - 1 = 0.007417$.





In the binomial CRR model, the price of a 'live' option (Kruschwitz, L., 1999) may be calculated according to the formula

$$C_t^N = \frac{pC_{t+1,u} + (1-p)C_{t+1,d}}{e^{r\Delta t}}.$$
(7)

Consequently, it is possible to estimate the option value in any period t if $C_{t+1,u}$ and $C_{t+1,d}$ are known in the next period t + 1.

Since we are considering a call option, then in each period t, the price of a 'dead' option (Schafer, D., L. Kruschwitz und M. Schwake, 1998) shall be calculated according to the formula

$$C_t^A = \max\{S_t - K_t, 0\}.$$
 (8)

Using formulas (7) and (8), it is possible to sequentially calculate the option prices beginning with Quarter 4 and ending with the present moment of time (Figure 2). In this connection, in each node of the binomial tree, the maximum price is selected out of the prices C_t^N and C_t^A for the purposes of sequential calculation.



Figure 2 BINOMIAL TREE OF REAL OPTION PRICE VARIANCE (USD)

As a result, working in the tree from its end to the beginning, we may obtain the price of this pilot project option in zero. It will be $C_0 = 2,468$ USD. Then NPV of the equipment upgrading project with 9 options will be NPV = $2,468 \cdot 9 - 1,511.25 = 20,700.75$ (USD), which is somewhat greater than the calculation result according to OPM. This is an amended estimate of the project effect.

CONCLUSIONS

All these conclusions may have a significant impact on management decision making in respect of investment in innovations. The results obtained may contribute to upgrades of the software used to draw up and valuate real options. And the main thing is that they may be useful to businessmen, managers and financial analysts of primarily manufacturing companies with a view to developing and substantiating strategic decisions in innovative business development.

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MANAGING SUSTAINABLE DEVELOPMENT OF THE REGIONAL ECONOMY IN THE CONDITIONS OF RUS-SIAN'S ACCESSION INTO WTO

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ABSTRACT

The article defines the concept and the conditions for sustainable development of regional economy, the role of state regulation in this process, reveals challenges of sustainable development of the regional economy in the current conditions of Russia's accession to the World Trade Organization (WTO), necessary conditions for its ensuring are defined, the main directions of the regional economic policy which conduce to improve the sustainability of the regional economic development, are developed, government regulation tools are recommended.

Key Words: State Regulation, Sustainable Development, Regional Economy, Economic Forecasting, Economic Policy

INTRODUCTION

In modern conditions of Russia's accession to the WTO the actual task for the region is to ensure the sustainable development of the national economy. The regions of Russia, being in the common economic space of the country play an important role in the processes of ensuring the security and stability of the national economy. Therefore, the determining factor of security and stability of the national economy in terms of Russia's accession to the WTO becomes a sustainable development of the regional economy. Sustainable development of the regional economy depends on the development of economic potential, economic stability of a regional system, the branch structure of the regional economy. Depending on these factors, the problem of ensuring the sustainable development of the regional economy in terms of Russia's accession to the WTO will have their regional characteristics.

Sustainable development of the regional economy, along with the general laws of development of the national economy is determined by the specific features which are related to the structure of the gross regional product (GRP), a specific gravity of competitive products of the basic economic industries, including exports to total production in the region, security resource potential income and the mentality of the population.

Depending on this, the problems arising in the conditions sustainable development of the regional economy in the conditions of WTO market will have their regional features.

Solving the sustainable development problems of the regional economy requires new approaches in determining the regional economic policy, strengthening the regulatory role of the state in managing the sustainable development of the regional economy, the development of the effective systems, tools and methods of state regulation.

THE RESULTS

Sustainable development of the regional economy is determined by the following conditions:

- 1. Economic independence;
- 2. A stable and sustainable development of the regional economy;
- 3. Maintaining the continuous growth of the regional economy.

Thus, the sustainable development of the regional economy consists of three essential elements:

Economic independence of the region expresses the degree of its economic security (primarily financial) resources that allow проводить the independent economic policy, the development of management forms and methods for sustainable development of the regional economy.

Stable and sustainable development of the regional economy is the ability the region's economy to withstand to the various impacts, leading to its decline and a rapid return to the original state in case of nonobservance, or to achieve higher point in its development, steady improvement in the quality of life and ensure a constant expanded reproduction of territorial and economic complex.

Maintaining the continuous growth of the regional economy is based on scientific and technological progress, innovation progressive forms and methods of work organization, the development of effective tools and methods for regulation of investment and innovation.

No less important are the relationship between the sustainable development of the regional economy and the economic stability of its systems as part of the mechanism of regional economic development, the source of which is the production of the gross regional product (GRP).

Sustainable development of the regional economy depends on the economic stability of the enterprises, which form a regional economic system. The economic stability of the entity is the ability of the economy to resist and prevent exposure that could lead to a decline in production. The production, which ensures the release of the necessary commodities with minimal costs with efficient using of factors of production and in time, can be steadily developing (Rubtsov, V.A., Gabdrakhmanov N.K., Mustafin, M.R., Arzhantseva, N.V., 2015, pp. 781).

Territorial and economic sustainability of the economic complex of the region is determined by its ability to maintain a continuous expanded reproduction, which is ensuring the stabile increase of a given level of output production and economic indicators. Thus, the concept of sustainable development of the regional economy is connected with the economic stability of the material reproduction of territorial-economic complex and in accordance with this is regarded as a socio-economic concept and is defined as a system of economic relations, providing a continuous maintenance of stability and economic growth of the regional economy (Glazev C. , 2007, p.54). It means that the economic sustainability of the economic system of the region is the basis for sustainable development of the regional economy.

Thus, the sustainable development of the regional economy represents such position of the regional economy which is determined by economic stability of its systems which can withstand the negative impacts of different reasons, which are leading to a decline in the economy of the region and a rapid return to the initial steady condition in the case of a breach or reaching a higher point its development. The sustainable development of the regional economy depends on the level of self-sufficiency and self-financing in the region.

The level of self-sufficiency of the region, means it's security of production, labor and natural resources, development of science, innovation and investment potential, the presence of structure-competitive industries, the products of which has a dominant position in the economy of the region. Trade balance of export-import of goods in the region, including the foreign trade balance should be steadily positive.

Appropriate level of self-sufficiency in the region allows it to pursue an independent economic directed on ensuring the sustainable development of the regional economy.

The stability of self-financing of the regional economy of the region is provided by conducting financial, credit, tax and price policies, the development of the securities market as a source of capital flow into the regional branches of the economy, the establishment of equal relations in the economic field between the federal center and the regions, particularly in the financial relationships with the federal budget, with taking into account the specifics of the region, the development of effective tools of the state regulation of investment and innovation activities, a mechanism of attraction foreign investment to the regional economy, the increase in volumes of competitive export production, increasing per capita income.

The mechanism of attraction foreign investments should promote real investment of foreign financial and material resources to the regional economy, rather than creating the conditions for buying the national wealth at a cheap price.

Thus, taken measures to a wide attraction of foreign investment in the regional economy must be regulated so that to meet the national interests, and foreign companies which are investing their funds could not establish control over key industries of the region.

Self-sufficiency of the region (the regional economy) is realized through the obtaining income from commercial activities of business entities territorial-economic complex.

Businesses and organizations objectively unite into the interconnected managing complex to provide extended reproduction process on the basis of costs' self-supporting and maximizing profits.

Thus, sustainable development of the regional economy, which is defined by its economic potential (industrial, financial, labor, academia, innovation, investment, natural), also implies a level of economic development of the region, that maintains a constant process of expanded reproduction of territorial and economic complex that provides a stable growth in the final production and economic indicators, such as the annual GRP growth or maintaining inflation within the limits.

Thus, in our understanding of the sustainable development of the regional economy is a state of development of the economy of the region, defined by its economic potential and stability of its systems, ability to withstand the negative impacts of different reasons, which are leading to a decline in the economy of the region and a rapid return to the initial steady state in If the breach, to maintain a constant process of reproduction of territorial and economic complex that provides a stable growth in the final production and economic indicators.

Sustainable development of the regional economy is possible with the formation of an appropriate regulatory system that ensures stability of final economic and production indicators development. Tools and methods of state regulation in this case are forecasting and programming, budget, price, financial, monetary, tariff and non-tariff methods that are impacting on the economic system of the region and ensuring its stability.

The purpose of the regional economic policy is achieving internal and external stability of the regional economic system. The internal stability of the regional economic system means such state of the economy of the region, which is characterized by the stability of the continuous reproduction of the territorial-economic complex, maintaining a positive trade balance of export-import of production, providing employment and appropriate standard of living of the population. The external resistance is the stability of the regional payment balance, a stable trade surplus, the absence of the external debt, the presence of a stabilization fund (gold reserves), the region's place in the all-Russian and international division of labor.

In general, sustainable development of the regional economy of a particular region along with the general laws of national economic development, has unique characteristics which are defined by the structure of GRP, a specific gravity of competitive products of basic industries in the total volume of the regional production, the presence of the export sector in the economy of the region, security resource potential (including scientific), incomes of the population. (Ostrey-kovsky V.A., 2005, 326 p).

The Republic of Tatarstan as one of the developed regions of the Russian Federation has a sufficient economic potential which allows ensuring its sustainable development.

Gross regional product in 2011 amounted to 1220 billion rubles or 132,4% compared to 2008, industrial output in 2011 amounted to 1294,5 billion rubles or 138,7% compared to 2008.

Investments in fixed assets in 2011 were 386mlrd.144mln. rubles, or 142% compared to 2008, the growth of agricultural production in 2011 amounted to 150.440 billion rubles, or 129% in comparable prices to the level of 2008, the value of the average monthly accrued salary increased from RUR 14,904.0 in 2008 to 20,009.4 in 2011 or 135% of the level of 2008. (Artyuhov V.V., Zabelin S.I., Lebedeva E.V., Martynov A.S., Mirutenko M.V., 2011).

Thus, the level and the growth rate of the final production and economic indicators of Tatarstan Republic lets say about the sustainability of the regional economy.

In the conditions of WTO market the sustainable development of the regional economy will be determined by the structure of the regional economy. For example, the structure of Tatarstan Republic's GRP has its regional particular qualities: the greatest proportion of its mining (22.9%) and manufacturing production (15.4%) (Hamidullin F.G., Khairullov D.S., Khomenko V.V., Tarasov V.M., 2004, 192p).

It means that in the conditions of WTO market there may be the threat of losing the external stability of the regional economy as a result of developments conjuncture on the international energy market (for Tatarstan - a decline in oil prices) and the internal stability of the regional economy due to the lack of competitiveness of manufacturing industries enterprises with foreign firms, which may generally lead to a loss of sustainable development of the regional economy. Similar problems may occur in other regions of the Russian Federation as a whole and lead to loss of stability and security of the national economy (Rossiyskaya Gazeta, 2009).

Therefore, in the present conditions of Russia's accession to the WTO it is necessary to strengthen the regulatory role of the state in providing security and stability of the regional and national economy. This will require new approaches in defining regional economic policy, the development of an effective system, forms, methods and instruments of state regulation of the regional economy's sustainable development (Vasily Leontiev, 1997. 478p).

The main instruments of state regulation of the regional economy stable development in these conditions are the prediction and programming. The task is to determine the optimal prediction mutually balanced scorecard production and distribution of products in the region, ensuring the achievement of the highest possible level of output production and economic development indicators which allow supporting sustainable development of the regional economy. To this end we need to work on the development of economic-mathematical natural-cost intersectoral balance model of production and distribution of products, including foreign economic relations, by the sectors of the regional economy. (Input-output economics, 2015) This model allows us to take into account the mutual influence of changes in the economy and 50 major industrial and agricultural products). Based on this model there can be made versions of calculations to determine the quantitative estimates of the effects of economic relations on the final production and economic development indicators of the regional economy (Tyumen Publishing house IFSP SB RAS, 2000).

Balance Equation of production and distribution of products in the region:

 $Xk = \Sigma akjXj + Rk + Hk + Zk + Vk - Wk$ (Equation (1)

xk - the volume of production k; Xj – the volume of the industry production; akj - expense ratio of the product k per unit of j industry's production; Rk-market funds product k; Hk - other non-productive consumption; Zk-other elements of the final product; Vk-export volume of region; Wk-import volume in the region;

Using the program LP-88 to calculate with a modified simplex algorithm it is possible to obtain the optimal solution to the problem. As a result of this calculation we determine the optimal forecast of a mutually balanced system of production and distribution indicators, which provides in terms of resource constraints the maximum possible rate of growth of final production and economic indicators of the regional economy's development, allowing supporting sustainable development. The using of this predictive tool is particularly relevant in the conditions of WTO market. With its help you can determine in advance (conducting appropriate market research of WTO market) changes in the economic situation in one of the regional economy's sectors (such as a decline in production volumes as a result of industry competition) and its quantitative impact on the final production and economic indicators for sustainable development of the regional economy. After calculating the forecasts there can be determined: how, and by increasing the production in which sectors of the economy this decline can be compensated to maintain optimal forward-looking indicators of sustainable development of the regional economy. In line with this, the governments make management decisions for the development of programs of state support for the enhance the of the industries competitiveness in these sectors of the economy, conducing to the retention of sustainable development forecast indicators of the regional economy.

In general, we can distinguish the following main challenges facing the region in providing the sustainable development of the regional economy in the conditions of WTO market:

- 1. Incompatibility of the structure of the regional economy market to the requirements of WTO.
- 2. The lack of investment for the restructuring of the regional economy.
- 3. The lack of competitiveness of the region production, the displacement of domestic producers from the domestic market as a result of foreign products import that will increase as a result of Russia's accession to the WTO.
- 4. The threat of food security because of cheap imports
- 5. Imbalances in the financial sector (financial deficit in the real sector of the economy).
- 6. The absence of the effective state regulation and tools of sustainable development of regional economy.
- 7. Underdevelopment of the securities market as a source of capital mobility in the regional industry.
- 8. Insufficient development of foreign economic relations.
- 9. Lack of managerial personnel, capable to modern methods of analysis and decision-making for sustainable development of the region.

Solving these problems requires new approaches in determining the regional economic policy, strengthening the regulatory role of the state in the management of sustainable development of the regional economy, the development of effective systems, tools and methods of state regulation.

The priorities of the regional economic policy at this stage should be:

- 1. The introduction of innovations in the production sphere: using the existing scientific and technical potential of the region, to ensure the steady growth of the economy, leading to a new qualitative stage of development.
- 2. The development of the programs for developing the regional economy's sectors of the region to meet the challenges of sustainable development of the regional economy.
- 3. The adoption of the state program for the development and support of small businesses, conducing to an increase in the GRP and the creation of new work places.
- 4. The restructuring of the organizational structure of the regional economy's management in line with the challenges faced in the implementation of industrial, social, investment and science technology policy to ensure the safety and sustainability of the regional economy in the conditions of WTO market.
- 5. The organization of the state regulation system of the regional economy's sustainable development.
- 6. The development effective tools and methods of the regional economy state regulation for it's sustainable growth.
- 7. Organization of training of managers, capable of modern methods of development of economic processes in the region and management decision making for the sustainable development of the regional economy.
- 8. The development of foreign trade, the searching for new markets of products distribution.
- 9. The development of the securities market as a source of capital mobility in the region's economy
- 10. Ensuring food security in the region.

CONCLUSIONS

Sustainable development of the regional economy depends on the development of economic potential, economic stability of a regional system, the branch structure of the regional economy. Depending on these factors, the problem of ensuring the sustainable development of the regional economy in terms of Russia's accession to the WTO will have their regional characteristics. The salvation of the problems which prevents the sustainable development of the regional economy requires new approaches in determining the regional economic policy, strengthening the regulatory role of the state in managing the sustainable development of the regional economy, the development of effective systems, tools and methods of state regulation. The main instruments of state regulation are the prediction and programming. The central forecast instrument is an economic-mathematical natural-cost inter-sectoral model of the balance of production and products distribution in the region. By using the calculations based on this model we can obtain quantitative estimates of the impact of changes in the economic situation in one of the elements of a regional system (economic sector, etc.) on the macro and micro indicators of sustainable development of the regional economy. Based on these calculations we can determine an optimal prediction of mutually balanced system of production and distribution indicators, which provides the highest possible level of final production and economic indicators of sustainable development of the regional economy in terms of resource constraints. In the conditions of WTO market the problems of sustainable development of the regional economy may happen. This is due to the loss of competitiveness of some industries and sectors of the regional economy as a consequence, the decrease in the level of production. In these circumstances, the role of the instruments (which are named above) is particularly relevant. On this basis you can spend variant

forecasts, taking into account the new economic situation in the sector of the regional economy (decrease in production output in the sector, etc.) and determine: by increasing the production of goods of which sectors of the economy, this decrease can be compensated to maintain optimal forward-looking indicators of sustainable development the regional economy. In line with this, the public authorities make their decision on the development programs of state support for the development and enhance the competitiveness in the industries in these sectors of the economy of the region, conducing to the sustainable development of regional economy.

Thus, the sustainable development of the regional economy in terms of Russia's accession to the WTO requires new approaches in determining the regional economic policy, strengthening the role of the state in economic restructuring in accordance with the tasks arising in the implementation of industrial, social, investment, science, technology and food policy ensuring the security and stability of the regional economy. It is necessary to carry out a restructuring of the management structure of the implementation of the regional economic policy, the formation of an effective system of state regulation of sustainable development, the development of tools and methods of state regulation.

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APPLICATION OF A MARKOV PROCESS AS A METHOD OF MODELING THE DEVELOPMENT PROCESS FROM THE PERSPECTIVE OF THE SITUATIONAL APPROACH

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ABSTRACT

This article describes a new approach to the problem of nonlinear systems development in terms of situational paradigm, the role played by Synergetics in describing nonlinear processes. Predictable for small periods of time and unpredictable for larger period's behavior is typical for many objects that are studied by economics, psychology and sociology. Not an exception is the discovery of chaos in deterministic systems. The philosophical solution of such complex and difficult task, as the creation of a holistic multi-dimensional theoretical image of rapidly changing, developing world, obviously, can be obtained with the help of a universal and powerful method of research, as is the situational approach. It is shown the possibility of using Markov process as a method of modeling the development of complex open systems described by statistical laws that have multi-valued, probabilistic relation.

Key Words: Markov Process, Statistical Laws, Probabilistic Communication, Synergetics Situational Approach, Non-Linear Science, Open Systems, Deterministic Objects, Stochastic Objects, Chaotic Behavior, Self-Organizing Systems

INTRODUCTION

In the philosophy of science, two views corresponding to the different types of reality often contradict to each other, taking into account the specifics of the so-called dynamic and statistical regularities. Dynamic regularities are often characterized by univalent and statistical regularities by multivalued probabilistic relations. According to the first of them, the most complex multivalued relations are conditioned by ambiguous, strictly necessary relations (this view prevailed until the twentieth century). According to the second view, phenomenon's are varied, so they are characterized by probabilistic connections that, in principle, are not reducible to a dynamic relationship. As for the dynamic regularities, they are the limiting case of statistical relations and their special significance. Scientific data confirm the presence of multivalued relations existing in reality.

A new area of research called nonlinear dynamics (nonlinear science), introduced next difference of modern ideas from the old ones into the problem of the scientific prognosis. It was thought that there are two classes of objects. One of them – determinate Prediction of their behavior can be given at any desired time. Others – stochastic. They are engaged in the theory of probability. It is not possible to speak about deterministic prediction and is only possible to deal with statistical characteristics – mean observations, variances, and probability distributions. In the last twenty years has been shown that there is another important class of objects. Formally,

they are deterministic - knowing their current status, it is possible to set what will happen with the system in an arbitrarily distant future. And yet it is possible to predict its behavior only for a limited period of time. Arbitrarily small error in the determination of the initial state of the system increases with time, in the future it is not possible to predict anything, because the system behaves chaotically. Here we again can speak only about statistical description. Such systems have been found in hydrodynamics, physics of lasers, chemical kinetics, plasma physics and astrophysics, geophysics and ecology.

Experts in the theory of chaos control, one of the rapidly developing areas of nonlinear dynamics, compare the management of many complex social and technical systems with cycling. These are systems, which are statically unstable, but it is possible to manage their movement. This change in worldview is reflected in the name of one of the works of Nobel laureate Ilya Prigogine - "Philosophy of instability".

In this series, a large place is occupied by the works associated with predictability and socalled dynamic chaos, which shows impossibility of giving a "long-term prediction" of the behavior of a huge number of even relatively simple mechanical, physical, chemical and ecological systems.

METHODS

One of the properties of deterministic systems with chaotic behavior is sensitivity to the initial data. Initial deviations over time increase, minor causes lead to large consequences. This phenomenon is sometimes called the "butterfly effect", title is explained that way: flapping of butterfly wings in an unstable system may eventually cause the storm, change the weather in the vast region.

Just in a variety of specific cases, it is clear - the order cannot be separated from the chaos. A chaos, sometimes acts as a super ordering.

However lately - especially with regard to the successful development of synergetics - there were allegations that "modern science is no longer a deterministic," and that "instability in some ways replaces determinism." Such statements do not include the following:

- 1. In the case of unstable systems there is no lack of determinism, but other, more complex pattern, a different type of determinism;
- 2. Understanding of the determinism necessary to be preserved, but be modified;
- 3. Should always clearly talk about what sense (meaning) of the term "determinism" is discussed;
- 4. It is necessary to move towards to a better understanding of determinism, because there is, in a certain sense, the highest type of determinism determinism with understanding of the ambiguity of the future and the possibility of entering the desired future. This determinism strengthens the role of man.

RESULTS

«Synergetics» (from the ancient greek. « Σvv » - the prefix with a value of consistency and « $\check{e}p\gamma ov$ » - activities), or the theory of complex systems - an interdisciplinary branch of science that studies the general laws of phenomena and processes in complex nonequilibrium systems (physical, chemical, biological, ecological, social and others) based on the inherent principles of selforganisation.

The subject of synergy are the complex self-organizing systems, which one of the founders of synergetics Haken defines the following way «We call system self-organizing, if it gets some spatial, temporal or functional structure without any specific external action. By

specific external action, we understand suchthat imposes the system structure or functioning. In the case of self-organizing systems is experienced external nonspecific influence. ... Thus, modern science is looking for ways for theoretical modeling of the most complex systems, which are inherent to the nature - systems capable of self-organization and self-development. »

The basic properties of self-organizing systems - openness, nonlinearity, dissipativity. The theory of self-organization is dealing with open, non-linear dissipative systems far from equilibrium.

Open systems - these are systems that are supported in a particular state due to the continuous inflow of external matter, energy or information that is necessary for the existence of non-equilibrium states, as opposed to a closed system, which inevitably tend (according to the second law of thermodynamics) to a homogeneous equilibrium. Open system - is irreversible system; time factor is important in them.

In open systems, a key role - along with the regular and essential - can be played by random factors, fluctuation processes. Sometimes fluctuations may become so strong that organization existed before cannot withstand and destroys.

The processes occurring in nonlinear systems often have a threshold character - with a smooth change of external conditions behavior changes abruptly. In other words, in states far from equilibrium, very weak disturbances may increase to giant waves that destroy the existing structure and promote a radical qualitative change in the structure.

Nonlinear systems, being non equilibrium and open, create and maintain heterogeneity in the environment themselves. In such circumstances, sometimes a relationship reverse to a positive relationship between the system and its environment can be created. Positive feedback indicates that the system affects its environment so that the environment produces certain conditions that inversely affect changes in the system itself.

Self-organizing systems - this is usually very complex open systems, which are characterized by a huge number of degrees of freedom. However, not all degrees of freedom of the system are equally important for its functioning. Over time, a small amount of leading, defining degrees of freedom in the system are allocated, which «adjust» the others. Such basic degrees of freedom of the system are called «parameters» (Solodukho N.M., 2003, p.3).

Synergetics is an interdisciplinary approach, because the principles that control the processes of self-organization, are represented the same, regardless of the nature of systems, and for their descriptions must be suitable general mathematical formalism.

The basic concept of synergy - is determination of the structure as a state, resulting from multivariate and ambiguous behavior of such structures or multi element or multifactor environments that develop as a result of openness of the system, flowing of external energy, non-linearity of the internal processes, presence of special regimes having more than one stable state.

The phenomenon of the appearance of structures is often interpreted by synergetics as a universal mechanism of direction of evolution observed everywhere in nature: from the elementary and primitive - to a complex, more perfect. From the ideological point of view of synergetics is sometimes positioned as a «global evolutionism» or «universal theory of evolution», which gives a unified basis for describing the mechanisms of all innovations. In due time cybernetics was defined same way as «a universal theory of management equally suitable for description of any operations of control and optimization: in nature, in art, society, etc.» (Afanasyeva V.V., 2002).

The word itself and the fundamental role in the creation of this approach belong to german scientist G. Haken. In self-organization, appearance of order, important role is played by

dissipative processes - diffusion, viscosity, thermal conductivity, and many others. However, the idea that these processes destroying the order in simple linear systems can be «the architectures of order» in a nonlinear world still seems paradoxical. To emphasize this unusual sight, one of the founders of the theory of self-organization I.Prigogine called the order arising in open non-linear systems far from equilibrium, and significantly associated with the scattering of energy, matter or information - dissipative structures. These structures were probably first discovered during mathematical modeling of one of the most complex and interesting biological phenomena - morphogenesis in 1952 by Alan Turing. Morphogenesis and cellular differentiation is remarkable that during the fission and development of cells containing the same genetic information, there is a complex organization, which is an organism. A.Turing suggested that the basis of morphogenesis is chemical processes.

This way from paradoxical mathematical object to the discovery of new phenomena of nature in many different areas is becoming more traditional for non-classical science. It made possible to create a new interdisciplinary approach - the theory of self-organization, or synergetics.

Synergetics - is nonlinear science. As one of the founders of nonlinear science may be considered Henri Poincare. One of the principal tasks of synergetics is to learn how to effectively store, process, transmit and analyze large information flows.

Synergistic research appeared in the 80s and carried only a physical nature, and then evolved in the 90s. Synergetics began to be used in biology, ecology, nowadays in sociology and the theory of scientific knowledge. In general, synergetics can be regarded as a new dialectical approach to the understanding of the development processes (concerning the development of the world) that originated in the second half of the 20th century in specific scientific knowledge.

Nonlinear Science is developing intensively. A new area of research «chaos management» was born.

Today among those who admit the fundamental importance of the theoreticalprobabilistic way of thinking and its greater commonality in comparison with the approach based on the principle of rigid determination, is common belief that thinking, which does not include idea of chance in its orbit, is primitive. (Bunge M., 1975).

Many important discoveries in the science of the 20th century are related to the identification of the effects of consistent behavior (synergism) at the macro level classes of individual elements (atoms, electrons, cells, individuals), chaotically behaving at the micro level. Spontaneously occurring coordinated behavior was observed among cell of organisms in the process of morphogenesis, among the elements of biocenosis or in social communities (Sabirzyanov A.M., 2005).

It is important to note that many new nonlinear phenomena of the world was discovered by solving important practical problems, in the thick of a scientific, technical, military projects and researches. These primarily include the problem of calculation of processes in nuclear and hydrogen bombs, nuclear reactors. Among the other solved problems can be identified studying of various phenomena of plasma physics processes and processes of controlled thermonuclear fusion. Weather forecast, calculations of missiles, aircraft, vehicles streamlining. Optimization of oil production processes, and processes in the lasers or jet engines. Trajectory calculations of missiles and possibilities of space flights with landing control of the robots on the Moon and Mars. Later were studied models of nuclear winter, the problem of losing control in SOI, calculations of numerous economic, biological, medical, social and environmental models. Distributed systems and continuous medium are one of the most complex and interesting objects of modern science.

Many types of flows occurs different types ordering:

- 1. the Karman vortex street, appearing in the flow around a circular cylinder;
- 2. convective platens observed in the heated from below layer of liquid;
- 3. Benard-Marengoni's instability, leading to the formation of hexagonal cells (Khismatullina Y.R., 2005).

Most of these models are nonlinear. Formally, this means that the investigated equations contain nonlinear functions. For them principle of superposition (overlay), which allows «to sew» the solution of more complex task from solutions of more simple tasks is unjust. These equations describe the situation in which change of external influences k times, unlike the linear systems, will not lead to a proportional response of the object. Essentially, the non-linearity means a huge variety of behavior and a wealth of opportunities - threshold effects, more than one solution, the existence of chaotic trajectories, and a paradoxical "anti-intuitive" response to the changing of external influences.

Development of non-linear mathematics, of synergetics, and with them also a new worldview and living conditions in the world - not just another fashion, but a natural stage of development of science and culture. Nonlinear science gives the chances that the enormous potential accumulated in mathematics and natural sciences would be claimed and helpful for answering the key questions about our existence, but also provides an opportunity for the development of deep interdisciplinary approaches and may be the basis for interesting philosophical interpretations.

If we look at the situation from the point of view of its constituent parts: the conditions, opportunities and factors and allocate the most likely for changing the system's state, it is possible to simulate the model step by step transition of the system into a certain state, taking into account only its current status at the same time and receiving the most significant for the finitary spread of transition situations. That, for a number of systems, use of the situational approach for modeling the changes in their qualitative states, although is quite difficult, but possible in practice.

From the perspective of the situational approach mathematically it can be interpreted as a Markov process. According to the definition a random process in the system S with discrete states S1, S2, ..., Sn, is called Markov process if for any point in time t0 the probability P of each of the states of the system in the future for t> t0, depends only on in the present state of the system, so it does not depend on its behavior in the past (when t <t0). For a Markov process "the future depends on the past through the present." It follows that the Markov process describing the evolution of the system, allows to describe an important class of stochastic processes with independent increments using the transition probabilities P (s, x, t, B) - probability of transition from the initial state $x = \xi$ (s) in one of the states y of given set of conditions B after a time t - s (formally P (s, x, t, B) means the conditional probability that ξ (t) ϵ B provided by ξ (s) = x, s \leq t (it is also called transition density of Markov process)). Thus, the Markov process can serve as a method of modeling, i.e. the practical application of the situational approach to nonlinear processes observed in nature.

A situational approach began to be applied with the beginning of studying nonlinear processes in mathematics, thermodynamics of irreversible processes, cooperative processes in quantum physics, self-organization processes in animate and inanimate nature, unstable objects

in astrophysics, polyvariance of development of human civilization in the social sciences, and others. The focus was on the possibility of direct mathematical modeling of processes.

CONCLUSIONS

Firstly, this approach directs to ensure much more thoroughly and specifically count all the conditions and circumstances under which there is an interaction between subject and object of knowledge. It advocates the creation of multi-theoretical model of the object in unity with the subject polyvariant considering situational conditions of getting the result. Secondly, the situational approach expands the range of objects of scientific research, since it sets the task of developing the methodology of cognition the elusive, fast changing and disappearing, chaotically and diverse manifested strange behaving objects (paranormal phenomena, unusual altered states of consciousness, etc.) (Diligensky G.G., 1991, p. 29).

Situational approach as a general scientific methodological approach is still forming and developing, but it certainly promises to become an important component of the entire postnonclassical paradigm.

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ROLE OF GOVERNMENT IN INNOVATIONAL REFORMS OF RUSSIAN ECONOMY

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ABSTRACT

This article is devoted to the problem of Russian economy innovational structure creation and maintaining. Authors point out, that building of innovational economy is possible only on the assumption of the government, political forces and business partnering mechanism efficiency. Those subjects have to closely collaborate, not confront each other, with clear differentiation of economic targets and responsibilities of all partners. General direction of the Russian economy social-economic structure reforming is its further maximal adaptation to the market of innovational products and services features. There is a necessity of task-oriented economical subjects, political and social groups retrieve aggregation with which will allow enhancing progressive Russian society forces influence to the basic economy development trend.

Key Words: Innovative Structure, Institutional Transformations, Institutional Environment, Venture Fund, Innovative Economy, Methods of State Regulation

INTRODUCTION

First of all further maximal adaptation's to the market of innovational products and services features of the Russian economy social-economic structure reforming supposes decline of national economy system institutional arrangement deformalization degree and stabilization of its underlying elements. Essential part in those processes appertains to the modern government which possesses powerful instruments for programming perspective development of economy and for making corrections to the functioning of the most national fields of economic activity.

According to the Rosstat data illustrated on Table 1 and Table 2 we can make a conclusion, that share of innovational active organizations in Russia in 2013 was only about 10,1% and specific weight of innovational commodities in overall quantity of shipped goods was even less – about 9,3%. Though in the Strategy of Innovation Development of the Russian Federation for the period up to 2020 "Innovative Russia – 2020" (Innovative Russia - 2020, 2010, 105 p.) it is mentioned, that a share of enterprises implementing tecnological innovations must be increased till 40-50% in 2020. In case of existing dunamic retention (when maximal innovational activity incrementation is only 0, 9% (in 2009)) it will be impossible to run up to such index value without activization of government role in innovational processes.

Table 1
ORGANIZATIONS INNOVATIONAL ACTIVITY (SPECIFIC WEIGHT OF ORGANIZATIONS
IMPLEMENT TECHNOLOGICAL, ORGANIZATIONAL AND MARKETING INNOVATIONS, IN %)
(KLAUS SCHWAB, 2015, P.18)

	2009	2010	2011	2012	2013
Russian Federation	9,3	9,5	10,4	10,3	10,1
Tatarstan Republic	14,5	14,9	18,1	19,1	21,0

Table 2 SPECIFIC WEIGHT OF INNOVATIONAL COMMODITIES AND SERVICE IN OVERALL QUANTITY OF SHIPPED GOODS AND SERVICE (KLAUS SCHWAB, 2015, P.18)

	2009	2010	2011	2012	2013
Russian Federation	4,5	4,8	6,3	8,0	9,2
Tatarstan Republic	17,9	15,6	14,9	18,4	21,1

METHOD

The main research methods, that underlie this article, are analysis of basic theoretical conceptions of indicated problematic investigation, statement of author's hypothesis, determining government role in reforming of Russian economy, and forming of argumentation system based on the official statistic data.

THEORY

Pursuant to World Economic Forum (WEF) data Russia is currently on the 53 place from 144 countries according to Global Competitiveness Report. Though Russian Federation Competitiveness Index could be significantly greater in case of innovations generation and development activation. As shown on Table 3 RF demonstrates maximal lag in innovation and sophistication factors index, which is one of the total competitiveness index components, Russia in this rank is only on the 75 place (Bagautdinova B.G., Sarkin A.V, Khadiullina G.N., Averyanov B.A., Arzhantseva N., 2014, p.49).

Table 3
THE GLOBAL COMPETITIVENESS INDEX 2014–2015: INNOVATION AND SOPHISTICATION
FACTORS

Country/Economy	Innovation and sophistication factors		Business sophistication		Innovation	
	Rank	Score	Rank	Score	Rank	Score
Switzerland	1	5,74	2	5,79	2	5,70
Japan	2	5,68	1	5,82	4	5,54
United States	5	5,54	4	5,58	5	5,49
Chine	33	4,14	43	4,38	32	3,91
Russian Federation	75	3,54	86	3,79	65	3,29

There are two dominant points of view to the government place in innovational processes in Russian economic science. According to the first of them government has to proceed amplification of the direct impact to the economical subjects. Partisans of this statement (V.Makarov, S.Stepashin, V.Zatonsky) adduce following arguments for benefit of government sector extension: reintegration of justice as a result of privatization process outcomes review; opportunity of purposive impact to the reforming of economic sector key enterprises forming its basic structure; considerable extension of budget revenue at the expense of profit and rental incomes capitalization and dividend payments from the assets of holding companies with government interest. Partisans of "strong government" conception in which, as rule, representative of authoritative structures are interested, aim at consolidation of the main income issues centralization, first of all – from the implementation of the nature resources, and their redistribution to the different social and economic development goals. (Mau V., 2006, P.4, Ismailov T.A., Gamidov G.S., 2003) Versus to the development references goals there are could be defined different economic scripts. In the case of proclaiming as a priorities a social field and a budget economy segment assistance the most effective strategy of economic development is so called strategy "Renter", which extended due to popular coalitions of the XX century. From the one side, its main results are rise of the most low-income population gaining's and social inequality level reduction. It stimulates an expansion of domestic demands for the national and imported goods and positively effects on the condition of national commodity-producers. From the other side, priority investment of the social field draws away material and financial resources so necessary for the large-scaled injections in the manufacturing economy basis, which technical features will change too slowly, what is not corresponding with an idea of innovational revolution.

The other target key point of the economy development at issue conception is priority national production segments support, first of all those that are orientated on primary goods, machine-building and some of high-tech economical branches. Their investment presupposes withdrawal of assets from social and culture spheres, scarcity of accounting enterprises supplying home customers demand and salaries of budget economy segment workmen and, as a result, diminishing of the most attackable population groups returns. Thereby economical "breakthrough" in selected production complexes will be based on amplification of the government distributional functions, its more active participation in production and economic processes with the help of direct enforcement methods or the measures of public relations field to reduce social intensity.

The main problem of the dirigistic model is complexity of creating government structure able to realize the mission of innovational development and large-scaled technological modernization of economy. The basic feature of centralized management chart is preferred orientation to the system of vertical unilateral connections transmission control impulses from centralized authority to coordinated economic subjects. Though realization of the modern innovational projects for the most part is orientated on the complex analysis of the feedbacks and different effects appearing as a result of creating new science intensive and advanced technology products, what is not corresponding with the government constructions logic. As a result the probability of formal approaches to the transformation processes application increases, authorities' corruption rises and increases the role of economical-political lobbying, and all this doesn't correspond with the principles of long-range economy development.

Associates of the second conception (E.Jasin, E.Gaidar, V.Mau) propose to act with the orientation on indirect methods through economy institutional structure consolidation, including institution of governmental authorities. They suppose that expansion of government sector is inexpedient, first of all, because it is characterized with low economic efficiency in comparison with the private property subjects. Increased load on the state run public authorities will lead further enlargement and, as a consequence, deeper bureaucratization of the economic decisions making system. Above all assets centralization will imminently be attended by information closure enhancement of determinate branches of economic activity and weakening of their control from the general public. Growing level of government spending in the final analysis will

be displaced to the subjects of real economy sector, what leads to their business activity slowingdown.

RESULTS

To our opinion the main propulsive forces of institutional reforms and modernization of the industrial basis of Russian economy are government and large-scale business (Pic.1). Representative element of social-economic system of developed capitalistic countries, called "civil society", without active assistance of which realization of any essential transformations is impossible, doesn't to act the determinative part in our society. Usually it is manipulated according to the interests of authority structures, or society conscience remains absolutely indifferent to the current economic changes. So special attention should be paid to forming of competitive corporate subjects, to the particularity of managing them and also to the government role in the further national economy reforming.

Figure 1
PERSPECTIVE ELEMENTS OF RUSSIAN ECONOMY INSTITUTIONAL ENVIRONMENT



Current processes of government participation in economic activity extension require development of special instruments system, directed on enhancement of government property managing efficiency according to principles of economic practicability then domination of political motives. Consolidation processes will satisfy requirements of innovational transformations way only in case they increase competitive ability of national real economy sector enterprises and assist them to develop pursuant to scientific and technological progress demands. As mentioned V.Mao, government assistance should be first of all administer to the projects orientated on the development of national infrastructure, creation and education innovational system elements, and also innovational reformation acceleration.

According to authors' opinion government, that for the first time enlarge amount of budgetary financing of scientific and technological sphere and credit enterprises that are orientated on R&D activity, have to transgress lately to indirect assistance mechanism. Promotion of innovational infrastructure and information exchange channels development, forming of advantageous investments conditions and a framework for entrepreneurial activity extension could in perspective produce grater economical effect than goal-orientated government programs of innovational projects financing that are really rationally implemented only in the spheres of special state interests in a form of government R&D contractual work.

Essential role in modification of prevalent new innovational companies financing system appertains to creation of different venture funds the main issue of forming which could be free market capitals as well as resources of bank economy sector. The basic obstruction on the way of their accumulation in Russian economy conditions is not only the lack of financial recourses, which could be gained due to enhancement access to the pension funds, insurance companies and private individuals deposits assets, but the absence of professional investors, increasing their purses at the expense of participation in the ownership of newly established enterprises and their comprehensive support in the marketing researches realization and management system optimization. Extended involvement of foreign investments to the purposes of innovational sphere development will permit, from the one side, considerably multiply capital inflow to the leading branches of national industry, and from the other side, to study mechanisms of venture financing system activation in associated activity process. In this case it is necessary thoroughly analyze a practice of venture capital implementing as the main source of investment financing in such countries as USA and Great Britain that possess more than half century experience in this private industry sphere. Establishment of venture finds will allow directing investment resources for innovation purposes, providing science intensive projects that have perspectives from the efficiency of their further realization point of view with capital.

Russia already has got an experience of using venture capital. Thought venture funds, first one of which began to appear in 1994 according to European Bank of Reconstruction and Development initiative and joined in 1997 into Russian Venture Capital Association (RVCA) are in need of financial and organization assistance from the government side.

According to the Decision of Russian Federation Government № 516 from August 24, 2006 was made a decision to establish Russian Venture Company (RVC) out of proceeds of Investment Fund assets as a government fund of venture RF funds. It ought to be a source of newly appeared investment companies financing. RVC is financing private venture funds giving them investment resources in amount of 49% from their own assets and has to invest capital to the development of nanotechnologies, extended leasing schemes in advanced technology products manufacturing implementation and their attainment contracts crediting. At September 21, 2007 first national venture fund "RVC – Venture Fund" with Co Ltd "Russian Venture Company" interest net wealth cost reached 3mlrd. 61 mln. Rubles.

Besides allocation of assets to the listed above target and creation of innovational companies and funds it is necessary to realize a package of measures to harmonizate institutional sphere of venture business activity, including system of efficient normative acts development

and precedence on the financial market changing. Government has to develop a package of measures to form favorable tax treatment and to simplify firm with venture capital registration processes. Also it is necessary to introduce add-ins into legislation, coordinating ventures activity, including property rights insurance arrangements in patent law, protection of the stockholder rights and other spheres. Only in this case fundamental basis for solving problem of accelerated scientific and technical development will be created by force of principally new investor groups formation which are orientated on innovational economy sectors supporting.

Let notice that only in this case fundamental basis for solving problem of accelerated development by forming of special investors groups orientated on innovational economy sectors assistance will be created. For this purpose, as noticed T.A.Ismailov and G.S.Gamidov, it is necessary to create national innovational-engineering-investment networked infrastructure widely-distributed in all country regions. Its creation is aimed on provision of effective science intensive innovational-investment service production at the expense of equity circulating capital with follow-up investments into projects in which executives orientated on eventual result will take active part.

In addition to enumerated above instruments of financing different economical fields it is also necessary to optimize so called "development institutes" activity directed on solving specific economic growth problems and rendering selective assistance to certain economical subjects groups. As an example of such institutes could be mentioned The Bank for Development RF which was established according to concurrent budget concept and is aimed on the development of new economy system segments. Non-profit character of this organization prejudices economical effectiveness and reasonableness of made decisions and also doesn't eliminate probability of lobbing different industrial-manufacturing groups interests to the prejudice of general economic prospects of reforming real economy sectors. So for authorizing immediate purposes of Bank for Development creation it is important to provide a package of measures supporting credit receiving objects selection clear scheme and assignable assets purpose-oriented usage supervision.

Summarizing stated in this article analysis, we can make a conclusion that generation of innovational economy is possible only on the assumption of government, political forces and business partnership effectiveness based on their not opposition but association with distribution of economical functions and each partner responsibility.

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CURRENT TRENDS IN DEVELOPING EDUCATION FUNDING IN THE RUSSIAN FEDERATION

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ABSTRACT

The article aims to analyze theoretical and practical aspects of developing education funding mechanism as a business tool to provide availability of higher professional education in the Russian Federation, taking into consideration the support provided by the state for education funding in order to solve social and economic problems, motivate and support national banking sector. Successful implementation of education funding programmes largely depends on the degree to which the prospective credit party, the banking institution and the state respect each other's interests. Russian banks tend to underestimate education funding potential as a possible way to receive alternative revenue by adding this programme to the product line. The demand for education services is not especially high, but it still exists and is expected to grow in the years to follow. This is above all due to the fact that higher education becomes predominantly fee-based. The results of this analysis allowed us to identify trends and future prospects of developing student loan projects.

Key Words: Education Loan, Student Loan, State Support, Funding Of Tertiary Education

INTRODUCTION

Nowadays maintenance loan projects are implemented in the majority of developed and developing countries. Each country has its own peculiarities but all of them share a basic feature, i.e. they form part of an efficient system of education funding and make it possible to attract additional resources to educational institutions.

Education funding offers an instrument which is able not only to provide an increase in availability of tertiary education and adapt it to social needs, but also to encourage universities to create and extend high quality educational programmes to meet the demands of contemporary economy and labour market. To put in another way, student loans allow implementing new integration and social partnership mechanisms in educational sphere involving all the participants interested in forming graduates' professional competence: prospective employers, educational institutions, credited party (students and their parents), state (Simanaviciene Z., Giziene V., Jasinskas E., Simanavicius A., 2015, p. 331).

Education loan as a repayable form of financing basically corresponds to implementation of the concept of targeted investment in human capital. Such investments are especially efficient on condition that the person obtaining a higher professional education in future can repay the student loan due to a higher income provided by the education obtained. Successful implementation of education funding programmes largely depends on the degree to which the prospective credit party, the banking institution and the state respect each other's interests.

This study aims to create a model of education funding accessible to the public, which should be adequate to Russian economic background, as well as analyze the current status of Russian education loan market and identify its development trends.

LITERATURE REVIEW

Analysis of the literature on the problem existing nowadays demonstrates that on the one hand, the majority of researches focus on legal (the greater part of the published studies), social and economic factors, related to building education funding market in the Russian Federation, which is currently under-developed (Ruzmanova U., Chuvilayev P., 2013). On the other hand, much attention is paid to implementation of student loan programmes in order to reduce the access barriers to education services for broad layers of population. Considering the rapidly changing economic environment, mutual agreement between these aspects is conceptually vital, and is necessary to create a model for crediting students, capable of meeting world standards, and at the same time accessible to Russian citizens with various income levels and possibilities (Eckwert B., Zilchat I., 2015, p. 101).

SCOPE OF RESEARCH

Education funding is a specific type of consumer crediting which possesses a number of features:

- 1. credit repayment occurs as a direct transfer to the educational institution's account;
- 2. lower level of interest rates;
- 3. the object of crediting is performed by a non-material asset;
- 4. requires minimum income to initiate repayment;
- 5. does not require any kind of security or warranty;
- 6. adaptive payment date which implies a grace period and payment delay;
- 7. seasonal nature of crediting.

The distinctive feature of student loans consists in their target orientation on paying for educational services and other accompanying expenses.

Interest rate on education credits is lower than that on consumer loans: in large banks the interest rates are 3-6% lower as compared to non-purpose secured credits, in middle-sized and regional banks the difference is 1-3% (Joohnstown, D.B., 2013).

Student loan has a prolonged repayment period which approximately lies between 10 and 11 years. Such credits imply a grace period (equal or superior to the term of apprenticeship), when the borrower repays only the interest charge (the principal of the loan is to be paid by the student after his/her graduating from university and starting a working career). It should be noted that we consider an education loan only the kind of loan which is supposed to be repaid directly by the student.

It is important to highlight that the payment can be delayed in case of an academic leave in accordance with statutory provisions or the student being called to military duty. The former case implies a 1 year delay, while in the latter the payment must be postponed for the whole period of military service. Social protection implemented in the system of education funding cannot be applied to consumer crediting (Goksu A., Goksu G.G., 2015, p. 1152).

Taking into account all the features mentioned above we can define education loan as a specific type of consumer credit characterized by a complex object of financing which includes educational services together with other accompanying expenses, a prolonged payment period that can provoke high risk of credit default; such kind of crediting presupposes interaction between al least four interested parties, including the state, the borrower (student), the bank and the higher educational institution. By accessible to public education loan we understand a loan which can be received with no regard to the parents' material situation and credit worthiness, the borrower's professional promotion rate or the prospective increase in revenue of a certain student.

RESEARCH METHODOLOGY

Demand for education loans among students and their families is undoubtedly existent and some Russian banks make attempts to meet the current demand. However the number of citizens applying for these programmes still does not exceed several thousands of people, which can have several reasons, both supply-side and demand-side. To reveal the demand-side obstacles we conducted a research into the demand pattern on the part of students as immediate consumers, with the help of such methods as mathematic economic modeling and polling (Ruzmanova U., Chuvilayev P., 2013).

In order to identify the crediting parameters, which have the most significant effect on the trends in potential demand, in March and April 2015 we conducted a survey among 197 students, taking courses in different subject areas, including economics and management, information technologies, engineering, and applied chemistry.

The questionnaire involved the following logical blocks:

- 1. personal loan readiness test (to apply for a loan in order to pay for education services);
- 2. economic parameters of education funding (interest rate level, credit period, monthly payment amount);
- 3. organizational issues (transparency in the credit scheme, credit decisioning period, set of documents required for a loan application);

In order to assess numerically the obtained data, in conducting the poll we made use of on Harrington's verbal and numerical scale, presented in Table 1.

Grade description	Numerical value
Very high	0,8 - 1,0
High	0,64 - 0,8
Average	0,37 - 0 64
Low	0,2 - 0,37
Very low	0,0 - 02

 Table 1

 HARRINGTON'S VERBAL AND NUMERICAL SCALE

Multiple regression model was chosen as the basic one and was based on the ordinary least squares technique (OLS regression) which aimed to identify the interconnection between

the demand level on the part of potential student-borrowers and the crediting parameters which exert the most substantial influence on it (Klaas J., Vagizova V., 2014, p.157).

The initial regression model included 11 factors, corresponding the issues mentioned in the questionnaire. Following the results of the regression analysis, based on calculating the determination coefficient, multiple correlation coefficients, Student's t-test and Fisher's F-test, we obtained the following data, as presented in table 2.

Parameter name	Coefficient	Statistical error	t-statistics	P-value	
Interest rate	-0,110414	0,0656426	-1,6820	0,09424	*
Payments	-0,0784447	0,0571753	-1,3720	0,17171	
Security	-0,0937502	0,0577945	-1,6221	0,10647	
Credit term	0,181567	0,0653017	2,7804	0,00599	***
Transparency	0,144324	0,0732249	1,9710	0,05021	*
Advanced repayment	0,107352	0,0632458	1,6974	0,09130	*
Sanctions	-0,0439679	0,060255	-0,7297	0,46649	
Documents	-0,052894	0,0776065	-0,6816	0,49636	
Term	-0,200098	0,0801623	-2,4962	0,01342	**
Grace period	0,109045	0,0785371	1,3884	0,16666	
Deferral	0,0704596	0,0862532	0,8169	0,41504	

Table 2
MODEL 1-OLC, USING OBSERVATIONS 1-197 DEPENDANT VARIABLE: DEMAND

Avg. of dependant variable	0,634721	Statistical deviation of dependant variable	0,185510
Residual sum of squares	7,813340	Statistical model error	0,204957
R-square	0,909264	Corrected R-square	0,904386
F(11, 186)	169,4455	P-Value (F)	1,22e-90
Log. Verisimilitude	38,36517	Akaike criterion	-54,73033
Schwarz criterion	-18,61509	Hannan Quinn criterion	-40,11061

Despite the high value of determination coefficient, the significance of Fisher's Fcriterion value (the critical value equals to 1.34 at the significance level of 1%), t-test value for the majority of coefficients appear non-significant according to Student's criterion (p-value of these coefficients did not exceed 0.05).

Having held a series of iteration we constructed model 2, whose main characteristics are presented in table 3.

Parameter	Coefficient	Statistical error	t- statistics	P-value	
Interest rate	-0,257678	0,0622774	-4,1376	0,00005	***
Payments	-0,157823	0,0574757	-2,7459	0,00661	***
Security	-0,167925	0,0570489	-2,9435	0,00364	***
Credit term	0,333637	0,0597412	5,5847	<0,00001	***

 Table 3

 MODEL 2: OLS, USING OBSERVATIONS 1-197 DEPENDANT VARIABLE: DEMAND

Avg. of dependant variable	0,634721	Statistical deviation of dependant variable	0,185510
Residual sum of squares	9,049177	Statistical model error	0,216534
R-square	0,894912	Corrected R-square	0,893279
F(4, 193)	410,8897	P-Value (F)	3,32e-93
Log. Verisimilitude	23,90130	Akaike criterion	-39,80260
Schwarz criterion	-26,66979	Hannan Quinn criterion	-34,48634

Test for validity of both the equation and the regression coefficient allowed to prove statistical certainty and confidence of the model provided. In other words, the way the parameters included in the model influence each other is not random. Hence, the results of the constructed model can be used for a further analysis of problems and development prospects of education funding and developing corresponding guidelines (Lough B.J., 2010, p.345).

The multiple correlation coefficient $R_{yx1x2x3x4}$ equals to 0.946, which testifies to a very strong correlation between the dependent and the independent variables. Moreover, while analyzing this index it is worth taking into consideration the fact, that in multiple regression models we can frequently observe such a phenomenon as multicollinearity (Protsko, E., Dornberger, U., Vagizova, V., 2014, p.540).

An analysis into pair correlation coefficient matrix presented in table 2 has demonstrated lack of such an effect between the explanatory variables (the coefficient values do not exceed 0.7 in absolute magnitude).

Demand	Interest rate	Payments	Security	Credit period	Parameter name
1,0000	-0,375	-0,318	-0,298	0,165	Demand
	1,0000	0,252	0,0653	-0,1331	Interest rate
		1,0000	0,0157	-0,0930	Payments
			1,0000	-0,0882	Security
				1,0000	Credit period

 Table 4

 PAIR CORRELATION COEFFICIENT MATRIX

Due to the specific nature of the data in use we also conducted a heteroscedasticity test.

Heteroscedasticity leads to deviations in variance estimation of linear regression coefficients, and discrepancy between actual confidence intervals and stated ones. Breusch-Pagan test and Koenker test have demonstrated absence of this problem in the resulting regression equation. Thus, following the above-mentioned facts, we can infer that the results of the model developed can be employed to conduct a further analysis into problems and prospects of education funding and offer corresponding recommendations (Teker, S., Teker, D., 2014, p. 849).

DESCRIPTION OF RESULTS

In accordance with the conducted research one of the principal factors having immediate effect on prospective demand is the credit term. The borrowers found period between 8 and 12 years the most convenient. This option was chosen as the most appealing by 49% of student respondents.

Figure 1 PERCENTAGE OF RESPONSES TO THE QUESTION: "WHAT IS THE MOST CONVENIENT CREDIT PERIOD?"



In general it is typical for the existing education funding practice in Russia, including state-backed loans. Meanwhile in Western countries the credit term is usually longer, between 15 and 25 years. The current situation in Russian banking sector does not allow approaching such figures. Limited experience in extending long-term credits by banks and predominantly short-term nature of Russian commercial banks' liabilities scales up banks' risks in long-term crediting, and leads to an increase in allocations to the legal loan loss reserves, which in its turn has an impact on the interest rate.

The cost of debt expressed in the interest rate is also a significant factor for students. According to the respondents its level will be considered optimum if it fluctuates between 5 and 9%.

Figure 2 PERCENTAGE OF RESPONSES TO THE QUESTION: "WHAT INTEREST RATE IS ACCEPTABLE TO YOU?"



The analysis, conducted earlier into currently available programmes of education funding by a number of Russian banks, estimated the interest rate scale between 12 and 25% per annum. Lower interest rates declared by banks tend to be followed by an additional commission charge for opening the account and its maintenance together with transfers which eventually approximates the interest rate to average market level. An education loan during the standard crediting period of 10 years requires double or triple repayment of the principal borrowed sum (Booij, A.S., Leuven, E., Oosterbeek, H., 2012, p.31).

A need to lodge security and provide guarantee is the factor that decreases the demand level on the part of students. Being represented by knowledge, the object of education funding possesses no material form and cannot be appropriated by somebody else, as it usually occurs in case of nonpayment of amount due at maturity in accordance with the credit agreement. This induces banks to demand other forms of credit security, in most cases to secure a loan they require cosigners, represented by student's relatives, acquaintances or friends.

Lack of material security which can be exempted in case of nonpayment makes it difficult for the banks to collect loan repayments. Moreover, the probability of nonpayment of the amount due increases, as a typical student-borrower is normally not able to start repaying the loan until he or she finishes the studies and starts working career, which leaves a prolonged period of time between drawing and repaying the loan. The majority of student respondents did not hesitate in admitting the possibility to work while pursuing their graduate studies.

Figure 3 PERCENTAGE OF RESPONSES TO THE QUESTION: "ARE YOU READY TO COMBINE WORK WITH STUDY?"



Banks on their part do not always realize the possible prospects of this form of crediting as an opportunity to build up a reliable long-term customer base: a student holding an education credit from a certain bank is very likely to apply to the same bank in future.

Russian banks tend to underestimate education funding potential as a possible way to receive alternative revenue by adding this programme to the product line. Those who make attempts to integrate this product into market do not pay sufficient attention to increasing public awareness about substantial advantages of this type of service, as compared to standard consumer credits. Approximately 60% of student respondents could not clearly articulate the idea of educational funding.

Figure 4 PERCENTAGE OF RESPONSES TO THE QUESTION: "DO YOU UNDERSTAND THE BASIC DIFFERENCES BETWEEN A STUDENT LOAN AND A STANDARD CONSUMER CREDIT?"



However, despite existence of certain problems this form of financing tertiary education has a high potential which has not yet been fully realized.

An analysis into Russian education funding programmes shows that despite its 15 year history, a student loan to pay for higher professional education is still a rare banking product.

In 2001 there existed 1 education funding programme realized by Sberbank, by 2006 their number increased to 15. What is more, credit amount covered only the expenses on tuition while the interest rate on the loan equaled to 18-20% for the period between 1 and 10 years with a credit guarantee as a pre-requisite. In 2007 the number of banks offering education funding programmes grew to 32 (interest rate 8-14% per annum for 1-15 years conditioned upon presence of trustees and ability to cover the accompanying expenses). By 2014 their number reduced to 10 (Ruzmanova U., Chuvilayev P., 2013).

The terms on existing education loans slightly differ from one another (except for the state-supported Sberbank education loans).

In the recent years the most popular option in Russia is a student loan for one year. It enables to pay for the first years of education. Subsequently in his third year the student finds an employment or transfers to a state-funded place. The interest rates on short term education credits are the same as on ordinary consumer loans: 16-18% per annum. They suppose no government grants or payment delays.

The procedure of processing a student loan is almost identical to that of obtaining an ordinary consumer credit.

The demand for education services is not especially high, but it still exists and is expected to grow in the years to follow. This is above all due to the fact that higher education becomes predominantly fee-based. Every year about 4-8% of state funded places at universities get eliminated, which primarily concerns humanities (7-8% annually), while sciences "lose" approximately 2-3%. Russian government and business community do not take active part in supporting national education funding system.

Accessible to public education funding system in Russia is still being formed. The last government programme was implemented between 2007 and 2012. 1,000 people participated in that programme. National budget made compensation for 11.65 mln. rubles to commercial banks. Overall volume of cash resources allocated for education funding equaled to 230 mln. rubles. In 2015 the number of students holding education loans is expected to reach 6% of the total number of students. Only 5 years ago this figure did not exceed 1 %. In contrast, in economically developed countries the fraction of students holding education loans reaches 75% (Shephard N., 2010, p. 40).

In Russian banks the government's initiative is widely supported: in order to end the stalemate in education funding market the potential borrowers should be offered favorable repayment terms which can be provided by means of substantial cash infusions from the state budget. It is the way that can provide a large multitude of Russian citizens an opportunity to obtain a higher education with the help of banking institutions.

CONCLUSIONS

In order to identify trends and future prospects of developing education funding programmes, we analyzed national and foreign crediting practices, polled potential borrowers and as a result formulated several possible scenarios for developing education funding system.

Option 1: Crediting by commercial banks, the borrowers' expenses being subsidized from the state budget.

Option 2: Extend student loans by crediting institutions with concessionary interest rate.

Option 3: Extend student loans using the funds of prospective employers as a part of their social programme.

Option 4: Extend student loans backed by a specially created national foundation aimed to support professional education in the Russian Federation.

Option 5: Extend student loans as a part of target programme "Creation and development of public accessible education funding in the Russian Federation".

Option 6: Education funding under insurance terms.

In order to improve the mechanisms to establish and develop an education crediting system accessible to the public (not only to low risk social groups, but to the vast majority or all students) we suggest a possible way to extend a student loan (Figure 5).





Professional education support Fund for the Russian Federation created by private and state companies together with the national authorities must become the state agency to accumulate information about all the education funding programmes offered by the banks.

Having selected an educational institution, the prospective student-borrower applies to the Fund to get advice and select an appropriate education funding programme.

Having created a preliminary folder for this loan the Fund transfers the information about the student (the prospective borrower) to the credit company, which, pursuant to the existing agreement for providing fee-based education services between the student and the education institution, extends funds to the borrower in an amount not exceeding a half-year tuition fee.

By executing a trilateral loan agreement between the credit company, the Fund and the student-borrower, credit companies get an opportunity to simplify the system for monitoring the quality of knowledge learned through higher education, as to receive the next tranche the student is to submit a certificate proving lack of academic failure and successful undergoing of the training course.

Thus, taking into consideration the need to develop education in Russia, we can positively assume that such type of banking product as student loan will become an efficient tool for developing fee-based education.

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KEY DEVELOPMENTS AND TRENDS IN PROJECT FINANCE MARKET

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ABSTRACT

The article comprises a set of theoretical and methodological approaches to the study of the concept of "project financing", and identifies some trends of development of the real sector in the project financing market of the Russian Federation and some prospects for growth of the realized deals in the project financing market. It also presents an overview of advantages of project financing transactions and assumes the main risks usually involved in such transactions. This article focuses on the role of banks in project financing and reveals some obstacles interfering intensification of production investment. It is assumed that project financing as a type of banking service is an effective tool for engagement in the modern economy.

The work done in the course of the analysis allows developing a software product for financial modeling of the project giving the opportunity to assess the effectiveness of investment and construction projects under risky conditions in the market of real estate.

Key Words: Project Financing, Long-Term Investment Projects, Risks of Project Financing, Financial Resources, Real Sector of Economics

INTRODUCTION

In the world practice project financing has been frequently used for decades to implement large-scale and capital-intensive projects. Russian companies integrating gradually into the world economic space face the need to implement the projects similar in its complexity and scale to the projects which are carried out by their competitors in the world markets. That is why project financing becomes potentially more and more popular and necessary in Russia and the very possibility of full application of project financing is essential for development of Russian companies and in the long run for our country's economic development.

Project financing as a tool for long-term investment projects is intended to provide financing for long-term investment in the real economy but due to economic policy pursued in Russia experiences a shortage of debt capital. Project financing growth with its own advantages will allow to make a significant quantum leap in Russia's transition to a new level.

The aim of the study is to summarize some theoretical and methodological positions concerning the formation of mechanism of project financing with participation of the commercial banks, as well as an analysis of the current state in the Russian market of project financing and some trends of its development.

GENERAL INFORMATION

The revenues generated exclusively in the framework of the project is the multiinstrumental form of financing long-term investments allows to borrow funds in the amount of the company's total assets on condition of investing their own capital and aims to spread risks between the parties and at the same time the source of repayment of obligations.

In the economic environment there is a term «project financing» which implies a complex of tools for project financing, the term «project loans» is missing (Bolshakova, M.S., 2012, p. 22).

What they share is that the source of repayment of obligations are cash flows generated by the project out of touch with the current activity of the borrower, the assets of the project are the provision of such transactions.

The mandatory condition of providing a credit on the principals of project financing is investing their own funds by the initiators of the project in the amount of, as a rule, no less than 25-30% of the cost of the project.

Project financing offers a number of significant advantages for both the client (borrower) and the bank. The advantages can be summarized as follows:

- 1. the possibility of development (expansion of existing business / diversification of activities); the opportunity to raise funds in the absence of an operating business generating sufficient cash flows sufficient to service the loan debt; separation of financial flows according to the current and project business, since the projects are usually implemented by a specially created project company; the ability to attract resources for longer periods in comparison with the standard commercial lending in order to replenish working capital; individual approach of the bank (i.e. the transaction structure and terms of financing depend on the characteristics of the particular project);
- 2. fundraising ability without provision to cover 100% of loans; period of benefits before starting the operational phase of the project and a flexible repayment schedule depending on the progress of the project; an opportunity to invest their own funds step by step and their usage as the collateral assets created / acquired in the course of the project; receiving comprehensive banking services including individual counseling during the period of preparation of investment proposals in the framework of financial advisory services. As far as the banks are concerned the important feature of project financing is often the possibility of its usage as a tool to attract, to retain and to have a long-term cooperation with the customers of strategic and priority industries (Smirnov, A.L., 2011, p. 42).

In the course of the study we used the following instruments: Herfindahl-Hirschman index, regression analysis and real option method, which made it possible to assess the degree of restrictive practices in project financing, reveal the interdependence between the factors and assess the efficiency of the projects with due regard to their option characteristics.

RESULTS

At present Russian banking system does not have enough financial resources to support the real sector effectively and to meet the needs of all sectors of economy, including industry.

At the same time the problem lies in the fact that banks in the current situation do not implement the effective redistribution of the investment potential available to them.

The fact is that the ratio of the total net assets to GDP is much smaller as compared with the developed countries and it indicates that the role of banks is not high enough in Russian economy as compared with those of other countries.

As a result of growing disparities between the development of real and financial sectors

of economy there is a crowding out effect in which bank credits tend to be crowded out from the real sector rather than attracted to it.

The current dependence of banks on the short-term money market with deterioration in the financial situation of enterprises and organizations of the real sector of the economy has led to accumulation of crisis potential. At the same time there formed a link between the crisis in the banking sector and in the real sector of economy. Deterioration in the financial position of the non-financial enterprises and the appropriate compression of funds in their bank accounts have led to a decrease in the resource base of the commercial banks and their investment in production (Allen, F., Carletti, E., Marquez, R., 2011, p. 983).

The main obstacles interfering intensification of production investment are the following:

- 1. high level of investment risks in the real sector of economy;
- 2. short-term nature of the current base of resources of banks;
- 3. the market of the effective investment projects is not formed.

Traditionally credit risks are increased in Russia due to a number of economic and legal characteristics. Firstly, it is the general state of Russian economy which despite some improvements is characterized by financial instability of some enterprises, unskilled management, etc. Secondly, the imperfection of the legal protection of the interests of the bank as a creditor and its rights to the property of clients is inherent in the current system of registration of mortgages. Under these circumstances there is a significant concentration of credit risks concerning the limited number of borrowers (Krutova I.N., 2012, p. 92).

The next risk factor is a mismatch between the short-term liabilities and investment needs as a result of which investment lending threatens the bank's liquidity. Calculating the ratio of borrowed funds to those placed by banks indicates that the most balanced from the standpoint of resource availability are the short-term investments. With increasing the time of duration of investments the gap between investment amount and the sources of their funding invested for more than 3 years increases in funds up to five times.

Many commercial banks are engaged to a greater or lesser extent in short-term lending but the provision of investment loans and financing of investment projects are the spheres of activity of the certain categories of banks and due to their particularity they are able to reduce investment risks. These categories of banks include: banks of the financial-industrial group, the corporate banks formed on a sectoral basis and servicing corresponding productions and banks participating in the projects of the international institutions (World Bank, EBRD and others.)

The fact is that the market of investment projects has not been formed. The projects proposed are characterized by poor drafting. Banks are forced to deal with all work packages conjugated with project financing (Almeida, H., Campello, M., 2007, p. 1429).

Russian market of the long-term loans including project financing has a high degree of concentration.

The largest Federal banks with their sufficient long-term resource bases have the opportunity to place their funds in long-term assets but most of the other banks experience liquidity problems due to the fact that there is a gap in terms of investment and borrowing. These banks very often do not have access to the international markets for financing transactions of the project in its classical form. Maintaining the sufficient long-term liabilities and compliance in placing funds is the major factor in any credit institution and vice versa discrepancy is a deterrent factor in the development of project financing by the medium-sized banks.





Figure 1 shows the shares of the largest banks providing long-term loans. The top three leading banks are: Sberbank of Russia, VTB, Gazprombank. Roselhozbank, Alfa-Bank, Moscow Bank, Nomos-Bank, UniCredit Bank follow them and PSBank respectively closes the ten top.

In order to check the validity of this conclusion the mathematical calculation of Herfindahl-Hirschman Index was carried out and it allowed quantifying the degree of monopolization of the market of project financing. The index was calculated by the following formula:

$$HHI = S_1^2 + S_1^2 + \dots + S_n^2, \tag{1}$$

where:

- the market shares of credit institutions in the total volume of crediting of enterprises and organizations for more than 3 years in the country expressed as a percentage are defined as the ratio of the volume of loans issued to enterprises for more than 3 years to the total amount of allocated funds in the form of loans to enterprises and organizations by all credit institutions in the country in general.

n —is the conditional number of banks being the most significant participants of credit market of the legal entities according to rating posted on the Banks. Ru.

I equals to 2818, indicating a highly concentrated market.

As for the situation on the market of 01/04/2014 we can observe the same level of market concentration, however, the degree of concentration is higher and it forecasts further strengthening of the degree of monopolization in the future due to occurrence of mergers and acquisitions.

The above analysis of the dependence between the volume of project financing and the factor variables allowed to calculate the regression equation which describes the dependence between the volume of project financing and the amount of funds, the placement of funds by banks, the volume of profit of the credit organizations. Foreign investments into the banking sector can be expressed as follows:

$$Y = 973,53 + 0,1281 * X_3 - 0,0347 * X_4 + 1,2522 * X_6 - 0,4841 * X_7$$
(2)

where: V – is the volume of project financing; X3 – are the funds borrowed from banks;

X4- funds invested by banks in rubles, in total; X6 - amount of current year profit of credit institutions; X7 - foreign investments in Russian banking sector.

In this example the amount of borrowed funds X3 has the greatest impact on the value of project financing and foreign investments in Russian banking sector X7 – the least.

Reporting date	Volumes PF	Funds of banks	Banks' funds in rubles	The volume of the current year profit of credit organizations	Foreign investment in the Russian banking sector
01.04.2014 г.	5 358	36 261	10 282	375	771,5
01.07.2014 г.	5 235	37 455	17 739	375	806,0
01.10.2014 г.	5 117	38 649	25 051	375	840,5
01.01.2015 г.	4 965	39 843	33 350	375	875,0
01.04.2015 г.	5 807	41 037	13 031	375	909,5

 Table 1

 PREDICTED VALUES OF INDICATORS (BLN. RUBLES)

If we substitute the forecast data into the regression equation presented above we have the following forecast data concerning the volume of project financing. The expected volumes of project financing are presented graphically in Figure 2.





CONCLUSION

The need to intensify the participation of banks in the investment process follows from the interdependence of the successful development of banking system and economy as a whole (Almeida, H., Campello, M., Weisbach, M.S., 2011, p. 675). On the one hand, commercial banks

are interested in a stable economic environment being a prerequisite for their activities, on the other hand, sustainable economic development depends largely on the degree of reliability of the banking system and its effective functioning. At the same time the participation of credit institutions in the investment of different sectors of economy occurs only under favorable conditions because the interests of the individual bank as a commercial establishment are focused on profit maximization at an acceptable level of risk (Dietrich, D., Hauck, A., 2014, p. 230, Hori, K., Osano, H., 2014, p. 607). Due to limited access of Russian banks to the overseas markets under conditions of high uncertainty, the increase in investments in national economy goes down, therefore the importance of drafting financial instruments to create an efficient mechanism for project financing, involving credit banks, is evident.

Thus taking into account the need to develop production sector and upcoming changes in investment policy of Russia we can assume with confidence that project financing as a type of banking service will be an effective tool for engagement in the modern economy.

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STAGES OF BIOTECHNOLOGY COMMERCIALIZATION IN THE SYSTEM OF INTERACTION BETWEEN FINANCIAL AND INNOVATIVE INDUSTRIAL STRUCTURES

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ABSTRACT

Stages of the commercialization of biotechnology in the system of financial cooperation and innovation and industrial structures is currently not sufficiently explored and require careful consideration.

The international practice shows that currently the most efficient method of transition from research and development of biotechnologies to bringing them to the ultimate customer is mutually advantageous commercial interaction between all participants. This process is called commercialization of scientific research and development results. All its participants are economically motivated that is they are highly motivated to promptly attain commercial success resulting from use of new technologies.

This interaction will allow Russia to compete in the global market and increase the prosperity of the country. However, at the present stage is a not established effective mechanism of cooperation and financial innovation and industrial structures. Stages of the commercialization of biotechnology are not consistent and not developed. Current projects on biotechnology commercialization require substantial financial investment and professional regulation of both the state and the private sector.

Key Words: Commercialization, Biotechnologies, Funding of the Market of Biotechnologies, Stages of Commercialization.

INTRODUCTION

Arrangement of favorable conditions for development of biotechnologies is one of the top-priority tasks for development of the Russian economy. However, development of this segment is almost impossible without state support and engagement of investors in the commercialization process. The international practice shows that at the modern stage the most efficient method of putting biotechnological results into practice is mutually advantageous interaction of scientists, engineers, and investors that is those who are highly motivated to promptly attain commercial success as a result of use of biotechnologies.

To ensure efficient development of technology commercialization processes, it is required that both the public authorities and the private sector would take goal-oriented and systemic actions: fiscal and customs regulation, legislative arrangement for bona fide competition, protection of intellectual property rights, etc. Favorable economic and regulatory environment is required which means that new laws and mechanisms of their execution are needed. To ensure large-scale development of innovative processes, innovative structure and professionally trained specialists in the field of innovative activity and biotechnologies are needed.

Both Russian and foreign scientists have been involved in study of commercialization issues, determination of nature and content of these processes and pre-conditions for their historical development. G. Bagiev, L. Balabanova, T. Izmetyeva, F. Kotler, A. Kuzmichev, H. Mackay, A. Manko, I. Motorin, F. Nixon, F. Pankratov, B. Plotkin, T. Seregina, M. Solovyev, V. Tarlovskaya, I. Shapkin, etc. are among them.

The goal of the research is to study stages of biotechnology commercialization using a wheat processing plant as an example. Dynamic methods for assessment of investment projects were applied in the research.

STAGES OF COMMERCIALIZATION OF INNOVATIVE PRODUCTS

According to the international experience, one of the main sources of new technologies and innovations in the field of biotechnology are businesses engaged in innovative activities. Innovative businesses not only ensure development of the level of biotechnologies in the country along with the research institutions, but also have great importance for socio-economic development. Businesses in the innovative field form a healthy competitive environment, promote employment, replenish the state budget through taxes, create and maintain innovative activity in the country, and, most importantly, ensure economic growth (Kasatova A., Zakhmatov D., 2014, p. 175).

However, in the present conditions to ensure efficient development and to maintain their own competitiveness, it is not enough for the businesses to develop innovative products. It is also vital to market them. This process is called commercialization. All its participants (scientists, engineers, manufacturers, investors) are economically motivated that is they are highly motivated to promptly attain commercial success resulting from use of new technologies.

According to the definition of V.I. Mukhopad, commercialization is a process of conversion of the property item into profit using commercial means (Muhopad VI, 2010, p.511). E.A. Monastyrny and Ya.N. Grik defined commercialization as acquisition of income from its sale or use in own production (Monastyrnyi EA Creek YN, 2004, P.85). G. Kozmetsky describes commercialization as a process with the help of which results of scientific research and development activities are timely transformed into products and services on the market (J. Kozmetsky, 1999, 296p).

In other words, commercialization can be regarded as the process of launching innovative products onto the market. This process includes several successive stages (Figure 1).





At the first stage, basic research of the proposed product is performed. It is followed by the applied research, evaluation and selection of products which are the most beneficial for marketing. Evaluation is performed in the form of examination in accordance with some criteria: potential of an innovative product, demand for this product in the society, the potential buyer's demand for the product (in a particular segment of the market), potential cost efficiency of marketing of the products (net present value, internal rate of return, payback period, etc.). The third stage of the commercialization process is generation of required funds. As only a few innovative businesses have sufficient funds to finance developments themselves, at this stage the main task of the business is to attract the investor. At the fourth stage, the innovative product is launched onto the market. The final stage of the commercialization provides for the mature market including possible launching of an additional product.

Each stage of the commercialization of innovative products requires participation of different parties (Table 1).

Table 1
PARTICIPANTS OF THE PROCESS OF COMMERCIALIZATION OF INNOVATIVE PRODUCTS

		Basic research	Applied research	Commercialization	Market entry	Mature markets
Knowledge capital	competence	Scientific ability	Engineering ability	Ability to combine technology and market knowledge	Sales and marketing ability	Ability to build reliable mass production and distribution
Social capital	partners	Research centers and universities	Research centers and universities, and industrial researchers	Industry expert services	Lead customers Expert services	Industrialization and distribution partners
Financial capital	funding	Governets, public funding, Agencies, foundations	Public funding, Agencies, industrial pertners	Public funding, Agencies, angel/seed investors	Seed, venture capital, industrial investors	Customers, banks, industrial investors
	deliverable	Discovery Publication	Invention, technology Patent	Technology/market match Business plan	First product sold to first customer Pilot contract	Many products sold to many customers Profit

PROCESS OF BIOTECHNOLOGY COMMERCIALIZATION (SCIENTIFIC AND PRODUCTION ASSOCIATION BIOBIRSK, LLC)

Advanced processing of grain and, in particular, production of glucose-fructose syrups is one of the top-priority directions of the state strategy in the field of biotechnology which is specified in the Complex Program of Biotechnology Development in the Russian Federation till 2020 (http://government.ru/media/files/41d4e85f0b854eb1b02d.pdf, accessed may 2016). Therefore, it would be practical to consider the advanced wheat processing project of Scientific and Production Association BioBirsk, LLC, as an example of commercialization of the innovative product (Farid Hadi Abu Daoud Silong, ISMI Arif Ismail and Saroj Kumar Sarkar, 2011, p. 265).

The project provides for production of glucose-fructose syrups (50.9% of total production), gluten (6.8% of total production), starch (8.5% of total production), and pelleted feed (33.9% of total production).

Let us consider the overall strategy for commercialization of the advanced wheat processing project (Figure 2).

Figure 2 COMMERCIALIZATION STRATEGY FOR THE ADVANCED WHEAT PROCESSING PROJECT



At the incubation stage of the project, an engineering company is selected. Moreover, this stage involves development of an engineering project followed by its approval by the government. This stage shall result in conclusion of an agreement with the engineering company, elaboration of design documents and obtaining approval of the state for construction of the grain processing complex (VI Zinchenko, EA Monastyrnyi, S. Pogrebnyak A, AB Pushkarenko, NE Rodionov, GI sprat, AA Shaposhnikov and NK Shumikhina, 2003, p. 57).

The investment stage provides for construction of buildings and facilities, equipment supply, execution of construction and installation work, and commissioning of production facilities. This stage of the implementation strategy shall result in building of the plant itself and launching of pilot production.

Next, the strategy for implementation of the investment project provides for entry into the operation stage of the project implementation within the framework of which it is planned to start industrial production and to reach full capacity. The result of this stage will be mastering of production processes, production startup, reaching 100% capacity utilization as well as activation of all processes of business activity and interaction with counteragents, entry to the market of finished product and conquering a share in the domestic market of starch degradation products(Kateshova M., A. Kvashnin, the date of circulation: 25.01.2012).

The liquidation stage of the project provides for the sale of the operating business.

The advanced wheat processing project may be implemented in accordance with two models of project funding (Figure 3).





The first variant of the project funding with the participation of State Corporation Bank for Development and Foreign Economic Affairs is the most beneficial for the advanced wheat processing project. The second variant of the advanced wheat processing project funding provides for attraction of foreign investments and import financing by Euler Hermes which will result in reduction of the rate of domestic production in the field, slowing of the rates of economic growth and development of the country due to movement of capital abroad.

 Table 2

 INDICATORS OF THE PROJECT'S ATTRACTIVENESS FOR INVESTORS

Indicators of Attractiveness for Investors	Unit of measurement	Value
NPV	thousand rubles	2,024,058.6
DPBP	years	6.05
IRR (full)	%	29.9%

The net present value of the project is calculated by the following formula (Formula 1):

NPV =
$$-I_0 + \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t}$$
, (1)

where: NPV stands for the net present value of the project;

I₀ stands for the initial investments in the project;

CF stands for the cash flow;

r stands for the discount rate;

n stands for the number of periods;

t stands for a period of time (t = 1, ..., n).

The net present value of the project is positive, and it amounts to 2,024,058.6 thousand rubles which means that the project is economically sound and that it will generate added value

in the amount of 2,024,058.6 thousand rubles (NA Tikhonov, [electronic resource], accessed may 2016).

The internal rate of return (full), IRR, amounts to 29.9% which is significantly higher than the weighted average cost of capital (WACC = 10.51%) which also gives evidence of economic efficiency of the project, that is the advanced wheat processing project can not only serve the sources of funding but also generate profit (Lyashin A., the date of circulation: 27.01.2012).

The discounted payback period (hereinafter referred to as the DPBP) amounted to 6.05 years (Formula 2):

$$\mathbf{DPBP} = \mathbf{t} \text{ when } \sum_{t=1}^{n} \frac{\mathbf{CF}_{t}}{(1+r)^{t}} > \mathbf{I}_{0}.$$
(2)

where DPBP stands for the discounted payback period.

Therefore, the advanced wheat processing project is economically sound, and pursuant to the specified indicators it shall generate added value in the amount of 2,024,058.6 thousand rubles. Despite the fact thaAt there is a great dependence of the business on debt financing, the advanced wheat processing project can not only serve the sources of funding, but also generate profit through market capacity, difference between the production cost and the selling price as well as through competitive position in the field (Farid H., 2011, p. 145).

CONCLUSION

The obtained data bear evidence of the advanced wheat processing project's attractiveness for investors. However, at this stage projects in the field of biotechnology require substantial financial investment and professional regulation (Muhopad VI, 2010, 96p).

Therefore, I would like to propose the following directions for development of biotechnology commercialization in Russia:

- 1. arrangement for educational programs and courses for development and promotion of biotechnologies on the basis of educational institutions;
- 2. creation of exchanges for sale and transfer of technologies;
- 3. establishment of centers for biotechnology commercialization;
- 4. development of financial instruments that will expand funding sources for the market of biotechnologies;
- 5. establishment of interrelations between the stages of biotechnology commercialization

Development of these directions should contribute to development of biotechnology commercialization in the system of interactions between financial and innovative industrial structures.

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CONCEPT OF INTEGRATED MANAGEMENT OF FINANCIAL FLOWS OF AN INVESTING REGION

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ABSTRACT

In this paper, a concept of integrated management of financial flows of an investing region and associated risks has been developed. This concept includes the following areas: 1) a concept of management of financial flows, 2) a concept of management of investment flows and 3) a concept of management of investment financing risks. With a view to developing a general concept of integrated management of financial flows of an investing region, a separate new category of regional risks of financial flows has been conceived, which is an integrated index combining other regional risks, more specifically, the capital flow risk category.

In the light of direct influence of market factors on management decision making by a Regional Government, this paper contains a developed concept of capital flow risk management in the region. The Regional Government, as the most informed investor, is suggested to carry out arbitrage operations both in the home market and in a market located outside the region. The obtained cash earnings must be firstly distributed in the form of additional investment resources on a competitive basis among enterprises strategically important for the region. Based on the developed concept of capital flow risk management in the region, there has been created an organizational plan for capital flow risk management in economic life on the part of executive authorities represented by the Ministry of Economic Affairs of the Nizhny Novgorod Region: 1) using the stochastic dominance method and 2) using the financial arbitrage method.

Key Words: Investing Region, Financial Flows, Investment Flows, Capital Flow Risk

INTRODUCTION

Movement of financial flows in any country is predetermined by the extent of successful cooperation of the private market in such country with the public sector of the economy. A considerable number of academic economists and public administrators take up the position that the market cannot operate on its own; that is why; it is in need of regulation on the part of the government. However, there is still an open question: to what extent is such governmental interference required?

The problem of efficient management of financial flows becomes particularly relevant in the context of the national economy openness, accelerating dynamism of economic life, progressing constraint in resources provision, acceleration of financial and informational flows and decline in their manageability. Changes in process press for practical application of a financial flow transformation management system both nation-wide and at a regional level.

While analyzing financial flows of the economy's industrial and financial sectors, the analyst faces the effects exerted by market factors on capital flows from one industry to another

and, in particular, from one market unit to another. Such market units may include private- and state-owned enterprises as well as lending/banking institutions. Inclusion of state-owned enterprises within market units is due to their immediate interaction with the market through a system of prices for resources, raw materials and products. This being the case, it is required to assess and manage the capital flow risk distributed among economic sectors.

One of the most important issues, the solution of which will result in transformation of financial flows, includes attraction of investments. In modern science, investments are considered as one of the major sources of economic growth. Investments are defined as long-range financial placements focused on reproduction of capital, its maintaining and expansion, and an investment process – as redistribution of financial resources from those who own them to those who need them.

In this connection, it is required to create a general concept of integrated management of investor's financial flows based on capital flow risk assessment and management, which would allow integrated management of financial flows of private and public economic sectors with a view to developing methods for raising additional investment resources. Such being the case, it makes sense within the confines of a country to consider its regions as investors.

In this article, a general concept of integrated management of financial flows of an investing region has been proposed, which consists in assessment and management of the capital flow risk being an integral index combining other regional risks. With this end in view, the general concept comprises methods of financial flow management, procedures of investment flow management and techniques of investment financing risk management (Figure 1).





The term financial flows of an investing region used in this paper means countermovement of regional financial resources of the population, financial and non-financial businesses and the government to provide subsistence and development of the region and achieve goals set for the region. Investor's financial flows include investment flows. The term investment flows of an investing region means actual financial support of reproductive processes in the regional system. Following the national economic tradition, constituent entities of the Russian Federation and Federal Districts of the Russian Federation are regarded as regions.

THEORETICAL SUBSTANTIATION OF THE ISSUE

In this article, in order to develop the general concept of integrated management of financial flows of an investing region, particular attention is drawn to the goods and commercial services production sphere (GCSPS) since exactly this sphere affects the basic social and economic indicators of regional development. Financial flows existing in the GCSPS sphere represent a basis for revenues to budgets and extra-budgetary funds. Also, they in many respects determine income and, consequently, expenses of the population. In addition, the potentials of capital flow between enterprises and economic sectors have a direct influence on selecting a strategy of regional development and supporting priority areas of regional economy. Selecting such strategy for financial flow management is conditioned by the effect of market factors on the development of private and public economic sectors.

The term regional financial flow risk used in this paper means a potential loss in the economic activity of the region associated with overcoming an uncertainty in management of regional financial flows, in the process of which there is an opportunity of qualitative and quantitative estimates of the probability of achieving the contemplated economic effect, a failure and deviation from the target.

Among regional financial flow risks, we can distinguish political risks, legal risks, operational risks and financial risks. However, in addition to the known types of risks (Dymski, G., 1992, p. 337), we hereby add shadow burden risks (Koshelev, E., & Trifonov, Y., & Yashin, S., 2012, p. 281) and capital flow risks (Saarbrucken, 2002, pp. 29-35) as new categories of financial analysis. The resulting classification shown in Figure 2 is used to analyze financial flow risks of an investing region.





As shown in Figure 2, all regional risks bring about appearance of capital flow risks due to paramount effects of market factors. They appear in the wake of political risks, legal risks, shadow burden risks affecting the country's finance and economy as well as operational and financial risks. All these risks bring about variations in prices for goods, securities and financial instruments of the lending/banking system. Following the traditions of the German financial school, we will further call them all titles. In this paper, the concept of titles is somewhat extended, namely, they mean both business entities and entire economic sectors. The cost characteristics of such titles may include the market value of the property of business entities (such as market price of shares), the quantity of goods shipments in money terms and the amount of net profits of companies.

The capital flow risk in the economy is defined in this paper as a risk of capital movement among market titles in consequence of changes in the cost characteristics of some titles under the influence of the cost characteristics of other titles. Such risk parameters include, firstly, availability of similar title characteristics from the perspective of a consumer or an investor, secondly, a possibility of penetration of one business entity into the market where another business entity operates, thirdly, a possibility of entering into contractual relations between business entities with a view to reducing the detrimental effect of cost variance on own financial results. The capital flow risk to some extent determines possible capital movements from some regions to others and within the regions themselves. As a result, the regions develop differently, and this, in turn, affects development of the national economy in general.

Therefore, the general concept of integrated management of financial flows of an investing region based on the capital flow risk assessment and management contributes to integrated management of financial flows of private and public economic sectors with a view to raising additional investment resources.

RESULTS OF THE RESEARCH WORK

The concept of management of investment flows of an investing region (Figure 1) was described by us in detail in monograph (Saarbrucken, 2002, pp. 29-35). The concept of management of investment financing risks of an investing region (Figure 1) was developed by us in article. Let us then consider in some detail the concept of financial flow management as being the most basic and important for an investing region since it makes it possible to develop a general program for managing structural changes in the economy and industry of the region (Figure 1). With this end in view, let us examine in more detail methods included in this concept.

1. Procedure of Managing Capital Movements in Economy Using the Stochastic Dominance Method. This procedure allows, from the perspective of a conservative investor, comparison of different individual investment alternatives in whose capacity any economic titles, including industries, may act. For this purpose, it is suggested to use the stochastic dominance method. To put the resulting preferences in order, the voting theory methods should be used.

The mathematical argument for the correctness of this procedure was described by us in monograph. We verified its empirical reliability in monograph as well. It was obtained that the error in predicting the gross regional product (GRP) structure for two years was 0.22%. Then let us provide a theoretical justification of the procedure.

Assume that we know the change in the average weighted price of each of n alternatives (titles) in m observation situations. Let us represent this data as a rectangular matrix A of size

 $n \times m$, each element of which a_{ij} is equal to the price of the *i*-th alternative in the *j*-th observation situation.

To solve this problem using the stochastic dominance criteria, it is necessary to bring the A matrix data to a comparable form in terms of money value. To this end, we will first calculate the average value of the elements of each A matrix line, i.e. the average price of each alternative. Then for the elements in each of the lines, we will introduce the correcting factor k_i as a ratio between the average element of the 1st line and that of the *i*-th line.

Then we can compose matrix *C* of input data for stochastic dominance. It can be used to compare alternatives with each other since they are now comparable in terms of money value. Matrix *C* has the size $n \times m$, each of its elements is defined according to the rule

$$c_{ij} = a_{ij} \cdot k_i, \tag{1}$$

and the elements of each line of matrix C are arranged in ascending order for the sake of convenience of further calculations. Since in our case a_{ij} means prices of the *i*-th alternative in the *j*-th observation situation, then c_{ij} will be the prices adjusted for the sake of convenience of analysis of the *i*-th alternative in the *j*-th observation situation.

Then an alternative comparison matrix should be drawn up. This will be a square matrix X of size $n \times n$, each element of which denotes the number of votes of the *i*-th alternative against the p-th alternative and is defined according to the rule

$$x_{ip} = \sum_{s} (c_{is} - c_{ps}),$$
(2)

if $i \neq p$. The number *s* used in matrix *X* denotes corresponding elements of the *i*-th and *p*-th lines of matrix *C*, such as $c_{is} > c_{ps}$. Consequently, the elements of matrix *X* are obtained as a sum of positive differences in the elements of one line of matrix *C* and the corresponding elements of the other line of matrix *C*. Any alternative is not compared with the same one, so $x_{ip} = 0$ if i = p.

The alternative comparison matrix is symmetrical, i.e. $x_{ip} = x_{pi}$. Substantively, this means that the number of votes of the *i*-th alternative against the *p*-th one coincides with the number of votes of the *p*-th alternative against the *i*-th one.

Then let us supplement the reviewed approach with the voting theory elements. That is, let us compare the elements of the alternative comparison matrix X with each other by applying the relative minority rule with withdrawal. To this end, we will sum up the elements of each matrix X column and then zero the elements of the obtained k-th column with the greatest amount. Substantively, this means that the alternative with the greatest number of dissenting votes is excluded. The result is that in matrix X, the elements x_{kp} also take up zero values in view of the matrix symmetry property, i.e. this alternative k is excluded from further analysis.

We will then repeat the same procedure for matrix X so many times until there are two equal symmetrical elements left. To compare the two remaining alternatives, one can use the stochastic dominance criterion of the second order or compare them graphically.

The next step is regularizing the alternatives as they are successively excluded. The last left alternative will be the best one.

For illustrative purposes, an analysis was carried out based on the outcomes of trading on Russian stock exchanges over 14 weeks. The titles subjected to comparison included shares of the following issuers (joint-stock companies): AvtoVAZ – title 1, VNK – title 2, Purneftegz (privatized) – title 3, Samaroenergo – title 4 and Sakhalinmorneftegaz (privatized) – title 5. Shares of these issuers are the most interesting to analyze as they exhibited the highest average yield over 14 weeks: AvtoVAZ – 25.63%, VNK – 40.23%, Purneftegz (privatized) – 7.54%, Samaroenergo – 9.89% and Sakhalinmorneftegaz (privatized) – 38.01%.

The last 5 weeks of the whole 14-week period were taken as the period under review. The input data for analysis is given in Table 1. The relevant observation period in Table 1 is designated as where is the week number (s = 1, 2, ..., 5).

	Observation Periods					
Titles	Z_1	Z_2	Z_3	Z_4	Z_5	
1	131.152	104.202	106.964	114.817	130.164	
2	0.351	0.56	0.544	0.52	0.626	
3	23.318	30.873	30.873	33.132	37.853	
4	0.496	0.519	0.597	0.641	0.656	
5	35.974	38.324	37.97	104.27	39.698	

 Table 1

 WEIGHTED AVERAGE SHARE PRICE BY OBSERVATION PERIOD (RUB)

Finally, we obtained the following investor's preferences: 1 > 4 > 3 > 2 > 5. Since according to the analysis of historical data for the last 5 weeks title 1, i.e. AvtoVAZ shares, turned out to be most preferable, the demand for these shares would grow on the stock market, which would finally increase their market value. Whereas, the offering of title 5, i.e. Sakhalinmorneftegaz (privatized) shares, would grow, which would eventually reduce its market value. In a similar way, one can draw conclusions regarding capital flows among the other titles.

As shown by us in monographs, the conclusions reached do not contradict the classical rule of decision-making on the basis of the "yield/risk" criteria but merely supplement its results. Such outcome was obtained in reliance on the estimated average yield and the coefficient of yield variation of each title.

The resulting procedure makes it possible to develop a program for managing bank capital flows in the region's economy and actual capital flows in economic sectors.

Procedure of Managing Capital Movements in Economy Using the Financial Arbitrage Method. This procedure allows, from the perspective of a conservative investor, intercomparison of different arbitrage portfolios of investment alternatives in whose capacity any economic titles, including industries, may act. For this purpose, it is suggested to use the financial arbitrage method.

For the purpose of forecasting based on the data in Table 1, for each title there was obtained a function of linear dependency [14, 15] of its price on time:

Title 1: y = 114,8681 + 0,8639x, Title 2: y = 0,3661 + 0,0513x, Title 3: y = 21,8122 + 3,1326x, Title 4: y = 0,4503 + 0,0439x, Title 5: y = 29,2279 + 7,3397x, where y is the title price, and x is the week order number.

The obtained regression equations enable us to forecast prices for subsequent 4 weeks (Table 2).

	Price	Price Forecast					
Titles	in Z_5	Z_6	Z_7	Z_8	Z_9		
1	130.164	120.052	120.915	121.779	122.643		
2	0.626	0.674	0.725	0.777	0.828		
3	37.853	40.608	43.74	46.873	50.006		
4	0.656	0.714	0.758	0.802	0.845		
5	39.698	73.266	80.606	87.946	95.285		

 Table 2

 INPUT DATA FOR ARBITRAGE POTENTIAL EVALUATION (RUB)

Based on the data in Table 2, there were obtained multiple possible duplicating portfolios for each title. Selecting the minimum and maximum equivalent portfolios in terms of their value for each title, the relevant necessary calculations were made in Table 3.

Table 3DATA FOR EVALUATION OF CAPITAL FLOW RISK

Titles	Title Price in Z_5 (RUB)	Min Prices of Portfolio (RUB)	Max Prices of Portfolio (RUB)	T_np (%)	T ⁺ _{np} (%)	T_{np}^{\sum} (%)	Range ofVariation T_{np} (%)
1	2	3	4	5	6	7	8
1	130.164	93.238	255.162	-28.37	96.03	67.66	124.4
2	0.626	0.466	0.872	-25.56	39.3	13.74	64.86
3	37.853	27.195	-	-28.16	-	-28.16	28.16
4	0.656	0.555	0.853	-15.4	30.03	14.63	45.43
5	39.698	21.206	72.198	-46.58	81.87	35.29	128.45

Based on the data in Table 3, one can draw the following conclusions:

1. By the extent of the price variation risk (Column 8), the titles under review may be arranged as follows: 3 > 4 > 2 > 1 > 5. This means that in the near future, the price of title 3, i.e. Purneftegaz (privatized) shares, will be subjected to the lowest fluctuations, and that of title 5, i.e. Sakhalinmorneftegaz (privatized) shares, will show the highest fluctuations. We are here evaluating a conservative investor.

2. By the capital redistribution potential (Column 7), the titles should be arranged as follows: 1 > 5 > 4 > 2 > 3. This means that title 1, i.e. AvtoVAZ shares, is the most underestimated one of the five titles. In the near future, their prices will grow by the greatest value percentagewise, so more capital circulating in the stock market segment under review will be invested in such shares. Title 3, i.e. Purneftegaz (privatized) shares, is the only overestimated one. These shares will go down in price entailing a capital outflow from these market assets. We are here evaluating a marginal (averaged) investor.

The reached conclusions differ from the investor's preferences that have been obtained using the stochastic dominance criteria. Such discrepancies in the results are due to the following reasons:

- 1. The capital movement potential was assessed on the basis of retrospective data using the stochastic dominance criteria. Whenever we employed arbitrage technologies for assessment, we relied on forecast data. The key reason for the discrepancies in the results is different.
- 2. The stochastic dominance criteria allow individual alternatives to be compared. The arbitrage technologies, in turn, help compare each title with its duplicate portfolio composed of many other titles. This is possible in practice when the investor has a certain amount of market assets or is ready to effect sales on an unsecured basis. Otherwise, he has to compare individual titles.

If such an approach is applied to the capital flow potential assessment in the economy as a whole, this means that if each owner holds a business, the stochastic dominance criteria should be used for analysis. If, however, the owners diversify their assets, one should use the arbitrage technologies.

The resulting procedure makes it possible to develop a program for managing future capital movements in the region's economic sectors.

The procedure of managing capital movements in economy using instruments of statistical games (Figure 1) was described by us in detail in monograph.

Thus, the financial flow management procedure, the investment flow management procedure and the investment financing risk management procedure make it possible eventually to set up a process of integrated management of financial flows of an investing region (Figure 1). For this purpose, we have elaborated the following strategy.

3. Methods and Organizational Structure of Capital Flow Risk Management in the Region. These methods are based on the transactional approach. The basis of these methods is formed by the financial transactions shown in the diagram (Figure 3).





The Regional Government, as the most informed investor, is suggested to carry out arbitrage operations both in the home market and in a market located outside the region. The obtained cash earnings must be firstly distributed in the form of additional investment resources on a competitive basis among enterprises strategically important for the region.

With a view to managing the capital flow risk in the region's economy, for instance, the Government of the Nizhny Novgorod Region has to complete two organizational tasks: 1) manage the structural development of economic sectors; 2) manage additional investment resources for the development of business enterprises using the approach presented in Figure 3.

In order to complete the first task, it is required to use the stochastic dominance method (see paragraph 1). Based on the resulting predictive estimates, it is necessary to support those economic sectors where an outflow of capital is expected, but which are strategically important for well-balanced social and economic development of the region.

With this objective in view, the above mentioned executive authorities represented by the Ministry of Economic Affairs of the Nizhny Novgorod Region, pursuant to its missions and functions secured in legislation, shall be instructed to carry out the following activities (specified within brackets in Figure 4):

- 1. Write computer programs to complete integrated tasks of stochastic dominance of economic sectors.
- 2. Develop information and analytical support in the form of the specified programs, information and communication systems and implement a new innovative administrative technique in the government executive bodies.
- 3. Collect necessary information branch-wise for its subsequent computer processing.
- 4. Compile the collected data region-wide and process it in an integrated manner.
- 5. Develop a general regional strategy in reliance on the obtained estimates.
- 6. Develop a branch-wise tactical strategy for each economic sector.
- 7. Develop a full range of measures for implementation of each branch-wise tactical strategy.
- 8. Accumulate funds to exercise the global strategy of the region.
- 9. Perform intended budget allocation and carry out the above mentioned full range of measures.
- 10. Exercise government control over the intended use of budget funds and legal norms of implemented measures.
- 11. Collect data on the results obtained.





In order to complete the second task, it is required to use the financial arbitrage method (see paragraph 2). The resulting estimates make it possible to predict the risk of capital movements among economic sectors and among largest enterprises of the region taking into consideration the possibility of investing own funds by investors in different business areas. It is also possible to use the said methods to identify those arbitrage opportunities that cannot be implemented by the regional enterprises on their own due to a high cost of transactions for them (see Figure 3). While in the first case completion of the organizational task is similar to the task where the stochastic dominance criteria are used, then in the second case, it is required to complete an independent task, which can be only performed by executive authorities, firstly, because of availability of required information on the prices of basic products (works, services) in various districts of the region and, secondly, on the strength of the possibility to reduce the total cost of transactions due to scaling-up of arbitrage operations. As shown in Figure 3, the realized profits from such arbitrage operations may be distributed by the Government of the Nizhny Novgorod Region represented by the executive authorities among "profit centers" represented by regional enterprises on a competitive basis, or they can be used to support those enterprises, which are strategically important for well-balanced social and economic development of the region.

CONCLUSION

With this objective in view, the above mentioned executive authorities represented by the Ministry of Economic Affairs of the Nizhny Novgorod Region, shall be instructed to carry out the following activities (specified within brackets in Figure 5):

- 1. Write computer programs to complete integrated pricing tasks using arbitrage techniques.
- 2. Develop information and analytical support in the form of the specified programs, information and communication systems and implement a new innovative administrative technique in the government executive bodies.
- 3. Collect necessary information on prices for basic types of goods (works, services) in terms of largest enterprises of the region for its subsequent computer processing.
- 4. Compile the collected data region-wide and process it in an integrated manner.
- 5. Develop a general investment and pricing strategy of the region in reliance on the obtained information.
- 6. Develop a branch-wise tactical strategy for each economic sector and an investment tactical strategy for most socially important enterprises of the region.
- 7. Accumulate funds to exercise the global strategy of the region.
- 8. Perform intended budget allocation and carry out the arbitrage operations.
- 9. Exercise government control over the intended use of budget funds and legal norms of implemented measures.
- 10. Collect investment resources.
- 11. Distribute investment resources among regional enterprises.
- 12. Exercise government control over the intended use of investment resources.
- 13. Collect information on the efficient use of investment resources.

Figure 5

Organizational Structure of Capital Flow Risk Management by the Ministry of Economic Affairs of the Nizhny Novgorod Region Using the Financial Arbitrage Method

MINIS TER

Deputy Minister, Head	Deputy Minister, Head	First Depu		
of Forecast and Regional Development Directorate	of Strategic and Program Planning Directorate	Pricing Directorate	Directorate of Economic Analysis and Performance Evaluation of	Directorate of Fiscal Policy, Regulatory Activity and Control
Social and Economic Forecast	Investment Program Planning and	Department of Aralysis and Forecasts of Prices	Executive and Self- Governing Authorities	
Department	Monitoring Department	(Tariffs) în Economic Areas	Regional Development. Monitoring Department.	Department of Fiscal Policy, Civil Service and
Regional Development Department	S trategic Planning and Target Program Department	Depriment of Analysis and Forecas is of Prices (Tariffs) in Consumer Market	Analytical Department	Administration
	Target Program Sector	and Social Sphere Department of Analysis and Assessment of Price	Integrated Analytical Developments Sector	Department of Legal, Technical Activity and Control
	Strategic Planning Sector	Limits in Capital hwestment Area	Sector of Performance Evaluation of Executive and Self-Governing Authorities	

As can be seen from the above, the resulting methods and organizational structure of capital flow risk management in the region make it possible to set up a general process of integrated management of financial flows of an investing region.

All information obtained during the investigation conducted in this paper is useful to the Governments of Russian regions and to various potential investors who are going to invest their funds in the economy of a particular region of the country.

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MANAGEMENT MODEL OF ENTERPRISES OF HIGH-TECH BUSINESS BASED ON TECHNOLOGICAL INNOVATIONS: ANALYSIS OF HIGH-TECH COMPANIES RATINGS AT RUSSIAN AND INTERNATIONAL LEVELS

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ABSTRACT

The research is devoted to elaboration of the model of enterprises of high-tech business management. The authors analyze the high-tech businesses ratings at Russian and international levels. The authors' classification of high-tech businesses is given. The main provisions of the authors' classification of high-tech businesses are confirmed. The complex of recommendations on high-tech businesses' functioning in the Russian market is proposed. The empiric base of the research is the materials of high-tech businesses ratings according to Thomson Reuters (USA) and "TekhUspekh" (Russia).

Key Words: Management Model, High-Tech Businesses, Technological Innovations, High-Tech Businesses Ratings

INTRODUCTION

The dominance of the country's leading in the technological structure of the markets – both explicit knowledge market in the form of patents, trademarks (USA, Germany, Japan), and implicit knowledge market in the form of a modern intellectual management models in organizations, providing them with greater prosperity and longevity regardless of the type of economic activity, technology level, regional location, position on the curve of its life cycle, transnational character, popularity of trade marks (Japan) – convincingly proves the necessity to study management model of enterprises of high-tech business based on technological innovations, ratings of companies of high-tech business.

OVERVIEW OF THE THEORY

The following works are basic for our research: edited by Giotopoulos, I [1], Acemoglu, D. [2], Betz, F. [4], Romer, P.M. [16], Teece, D.J. [18].

The most important works in foreign economic literature in the area of business model of enterprises of high-tech business the authors used in this work are the following: Giudice, M.D., Peruta, M. R.D., Maggioni, V. [10], Herstad, S., Pålshaugen, Ø., Ebersberger, B [14].

In the field of knowledge management at the regional level, industrialized enterprises, the authors relied on the following works: Suleiman, S. Kassicieh, K. [23], Schoonmaker, M.,

Carayannis, E. G. [24], Scholten. S., Scholten U. [25], Chang, Y., Chen, M., Lin, Y.-Po, Gao, Yu-Sh [26].

The empirical basis of the research relies on high-tech businesses ratings according to Thomson Reuters (USA) [5] and "TekhUspekh" (Russia) [7, 11, 13]

METHODOLOGY

The research work in the framework of this article presents the implementation of the three interrelated stages: I. Development of a model of knowledge management in organizations: a micro-level. II. Development of methods of market analysis of explicit and implicit knowledge: micro,- meso,- macro level. 3. III. Development the classification of enterprises of high-tech business: meso- level.

RESULTS

This research presents the analysis of the Russian and international ratings of high-tech businesses functioning in the global science-intensive environment, using the authors' classification of high-tech businesses [1, 2, 3, 4]. The ratings analysis is based on the ratings by Thomson Reuters (USA) and "TekhUspekh" (Russia) in 2013 (Table 1, 2) [5, 6, 7, 11].

Table 1
RANKING OF TOP 100 INNOVATORS IN 2013 ACCORDING TO THE ANALYTICAL COMPANY
THOMSON REUTERS (USA)

Criterion	Group 1	Group 2	Group 3	Group 4
	Companies functioning in high-	Companies	Companies	Companies
	tech businesses	functioning in middle-	which can be	functioning
		tech businesses (high	attributed to	in low-tech
		and middle level)	both the 1	businesses
			and 2 group	
Number of	63	25	8	4
companies				
Name of	Abbott Laboratories; Advanced	3M Company; Air	ABB; CNRS;	Chevron;
company	Micro Devices; Alcatel-Lucent;	Products ; Arkema;	The French	Exxon
	Altera; Analog Devices; Apple;	Asahi Glass; Delphi;	National	Mobil;
	AT&T Avaya; BlackBerry; Boeing;	Dow Chemical	Center	Nippon
	Brother Industries; Canon; Corning;	Company; DuPont;	for Scientific	Steel &
	Covidien; Eaton Corporation;	Ford; General Electric;	Research;	Sumitomo
	Emerson; Ericsson; European	Goodyear Tire &	Commissariat	Metal; Nike
	Aeronautic Defence and Space	Rubber ; Honda Motor	a l'Energie	
	Company; Freescale Semiconductor;	Company; Jatco;	Atomique;	
	Fujitsu; FUJIFILM; Hewlett-	Lockheed Martin;	Fraunhofer;	
	Packard; Hitachi; Honeywell	Michelin; Mitsubishi	Google; IFP	
	International; IBM; Infineon	Heavy Industries; NGK	Energies	
	Technologies; Intel; Johnson &	Spark Plug Co., Ltd.;	Nouvelles;	
	Johnson; LG Electronics ; LSI	Nissan Motor	L'Oreal;	
	Corporation; LSIS; Marvell; Micron;	Company; Nitto Denko;	United	
	Microsoft; Mitsubishi Electric; NEC;	Procter & Gamble;	Technologies;	
	NTT; Olympus; Omron; Oracle;	Saint-Gobain; Sandvik;		
	Panasonic; Philips; Qualcomm;	Shin-Etsu Chemical;		
	Roche; Safran; Samsung Electronics;	Thales; Toyota Motor		
	SanDisk; Seagate; Seiko Epson;	Corporation; Valeo		

	Semiconductor Energy Laboratory;			
	Sharp; Siemens; Sony;			
	STMicroelectronics; Sumitomo			
	Electric; Symantec; TDK; TE			
	Connectivity; Texas Instruments;			
	Toshiba; TSMC; Xerox; Xilinx;			
Country	USA (33), Japan (17), France (3),	USA (10); Japan (9);	USA (2);	USA (3);
(number of	Switzerland (3), Germany (2), South	France (5); Sweden (1)	Switzerland	Japan (1)
companies	Korea (2), Sweden (1), Taiwan (1),		(1); France (4);	
originating	Netherlands (1)		Germany (1)	
from the			-	
country)				

Source: based on [5]

Note that the authors have distinguished the forth group of companies, functioning in low-tech businesses to prove their classification of high-tech business. On the contrary, the analysis of high-tech businesses according to "TekhUspekh" (Russia), the authors have not extinguished the companies, which can be attributed to the forth group according to the authors' classification of high-tech businesses [8, 9, 12]. The authors' classification of high-tech businesses distinguishes three groups of companies: the 1st group, engaged in high-tech science-intensive types of economic activity; the second group is engaged in middle- and low-tech types of economic activity, implementing high-tech businesses management, which results in the high level of technological development of the enterprise. This is achieved by a business model (or managerial knowledge) implemented in those enterprises; the third group is mixed, where: (a) enterprises can have simultaneously high expenses on technological innovations, high business organization, and function in low-tech types of economic activities; (b) science-intensive businesses, whose functioning can be attributed to the 1st of 2nd group (Table 1, 2) [14, 15, 16].

Table 2RANKING OF TOP 50 HIGH-TECH BUSINESSES IN THE RUSSIAN FEDERATION ACCORDING TO"TEKHUSPEKH" (RUSSIA) (2013)

Criterion	Group 1	Group 2	Group 3
	Companies functioning in high-	Companies	Companies which can be
	tech businesses	functioning in	attributed to both the 1
		middle-tech	and 2 group
		businesses (high and	
		middle level)	
Number of	28	7	15
companies			
Name of	"IT" group; "Armada" Close	"Danafleks-Nano"	"Interskol" Close
company	Corporation; "Scientific-Research	Ltd; "Scientific-	Corporation; "Industrial
	company "Electron" Close	Production	group "Metran" Close
	Corporation; "Prognoz" Close	association of Special	Corporation; "Diakont"
	Corporation; "Biokad" Close	materials" Close	Close Corporation; NPF
	Corporation; "Elar" Close	Corporation;	"Mikran" Close
	Corporation; "Geropharm" group;	"Gravioniks-K"	Corporation; NPF "Paker"
	"Medical Technologies Ltd" Close	(within Unikhimtek")	Ltd; "Pskovgeokacable"
	Corporation; NPP "Prima" Ltd;	Close Corporation;	Ltd; "NPP "Laser systems"
	"NTC ELINS" Close Corporation;	"Scientific-	Ltd; "Skif-M" Ltd;
	"Mir-Pharm" group; "Elteks" Ltd;	Production company	"Scientific-Production

	Engineering-technological center "Skaneks" Ltd; "BARS group" Close Corporation; "Center for Speech Technologies" Ltd; "T8" Ltd; "Center for Energy-saving automatization" Ltd; "MedEng" NPP Close Corporation; "Institute for Human Stem Cells" Public Corporation; "Inkom" group; "Be Pitron" Ltd; "Open code" Ltd; "ISS" Holding; "RMT" Ltd; "Linteks" Ltd; "Avalar.ru" Ltd; NPK "Reasonable solutions" Ltd; "Scientific-implementation company "Astrapharm" Ltd	"Macromer" Ltd; "Tion" group; "Institute for ecologic projecting and research" Close Corporation; NPO "NIIPAV" Ltd	center of magnetic hydrodynamics"; NPP "Resonans" Ltd; "Russian machine building corporation "Management systems" Close Corporation; "ObninskEnergoTech" Close Corporation; "Scientific-Production center "Lasers and TM equipment" Ltd; "Center for Innovative Technologies- Plus" Ltd; "Semi-conductor devices" Close Corporation, "Atkus" Ltd
Region (number of companies originating from the region)	company "Astrapharm" Ltd Moscow (13); Saint Petersburg (5); Novosibirsk region (3); Samara region (2); Tatarstan Republic (1); Nizhniy Novgorod region (1); Kaluga region (1); Penza region (1); Tomsk region (1);	Tatarstan Republic (1); Saint Petersburg (1); Moscow (2); Novosibirsk region (1); Rostov region (1); Vladimir region (1)	"Atkus" Ltd Saint Petersburg (3); Moscow (1); Moscow region (1); Chelyabinsk region (3); Tomsk region (1); Bashkortostan Republic (1), Pskov region (1); Belgorod region (1); Kaluga region (1); Saratov region
Type of activity (number of companies in this type of activity)	Informational and communication technologies (19); Pharmaceutical production and production of medical devices (9);	Construction construction materials chemistry ecology(4)and and	(1); Krasnoyarsk region (1) Machine building and electric equipment (15)

Source: based on: [11, 13]

Localization of high-tech business according to the authors' classification by the Russian and international regions is shown in Figure 1A and 1B respectively. It is obvious that the knowledge market of the country's leading in technological patterns (USA, Japan, and France) is characterized by the developed business models with participation of high-tech business according to the authors' classification, i.e. all types of economic activity. Their development dominant is reliance on managerial tools of knowledge economy. [15, 16, 17, 18] Localization of three groups of high-tech business in Moscow and Saint Petersburg follows this pattern in 2013 (Fig. 1A, 1B) [19, 23, 24, 25].

Figure 1 GROUPING OF HIGH-TECH BUSINESS IN THE RUSSIAN AND GLOBAL REGIONS (IN 2013)



Source: based on [5, 11]

Table 3 shows the comparative analysis of innovators' rating methodology according to Thomson Reuters (USA) and "TekhUspekh" (Russia).

Table 3
ANALYSIS OF INNOVATORS' RATING METHODOLOGY: INTERNATIONAL AND RUSSIAN
RATINGS

Methodology of rating of the	Methodology of rating of the most rapidly	Authors' comment
top 100 global high-tech	developing Russian high-tech businesses	
businesses according to	according to "TekhUspekh" (Russia, 2013)	
Thomson Reuters (USA)		
A. CHARA	ACTERISTIC OF A HIGH-TECH BUSINES	SS COMPANY
I. VOLUME	1. The company (group) income in 2012	1. Rating by "TekhUspekh" pays
1. Organizations with 100 or	was from 100 mln rub. to 10 bln rub.;	attention to: (a) financial-economic
more patent for innovations		indicators of the high-tech
_	2. Company's average growth rate (CAGR)	company, (b) innovative features;
II. SUCCESS	of the income is not less than 15% in the	(c) age of the high-tech company ^{1} .
2. Officially applied patents in	recent 3 years (2010, 2011, 2012);	[2]
the recent 3 years		
	3. Share of the income from new	2. Rating by Thomson Reuters
	products/service is not less than 30% on	focuses on: (a) the high-tech
	average (for machine building and	company functioning in the
	electronic equipment – not less than 20%)	international knowledge market; (b)
	in the recent 3 years (2010, 2011, 2012);	patent activity of the high-tech company.
	4. Average expenses on research and	-
	development in the recent 3 years (2010,	
	2011, 2012) are not less than 5% (for	
	machine building and electronic equipment	
	– not less than 2%) of income;	
	5 Average expenses on technological	
	innovations in the recent 3 years (2010	
	2011 2012) are not less than 10% (for	
	machine building and electronic equipment	
	- not less than 4%) of income:	
	7. Minimal age of the company is 4 years.	
Б. CHARACTERIS	TIC OF INVENTIONS OF A HIGH-TECH	BUSINESS COMPANY
3. Uniqueness is defined as the	6. In the recent 3 years the company has	3. The important rating tool of
first publication (patent	launched into the Russian market at least	Thomson Reuters is their own
application) in a new	one new or sufficiently improved product or	patent base DWPI, which allows the
technology, medicine, business	service, based on intellectual property of the	Thomson Reuters experts to
process, etc., in DWPI	company and confirmed by protective	promote the high-tech companies'
-	documents.	functioning in the international
III. GLOBALITY		knowledge markets.
4. Assessed by the presence of		4. DWPI includes patents on
four-parties patents in the		business development. According to
company portfolio, which		the Russian Patent Law, business
include patenting in the		processes are not subject to
following international		patenting. ²
agencies: the Chinese Patent		5. Using business models (including
Office, the European Patent		technological platforms, open
Office, the Japanese Patent		innovations) as a transfer of implicit
Office, the United States Patent		knowledge is implied in Thomson

& Trademark Office.	Reuters rating as an obligatory
	global activity of high-tech business
IV. IMPACT	[24, 25, 26].
5. "Down the line" invention	6. Using the scientific principle of
impact is defined by the number	patent citing and tracing its use by
of its citing by other	other organizations in Thomson
organizations in their inventions	Reuters rating marks the scientific
in the recent 5 years, excluding	principles in explicit knowledge
self-citing.	markets management.

Text - analysis criterion proposed by the authors; DWPI - Derwent World Patents Index Source: based on: [5, 11, 13, 20, 21, 22]

CONCLUSIONS

The research allows making the following scientific-practical conclusions:

The Russian knowledge market in 2000-2010 shows the dominance of implicit knowledge development as import and export of implicit knowledge. However, the significant volume of non-formalized knowledge are not implemented so far in business models, promoting the high-tech business to achieve high results in international markets. The authors consider that the situation can be improved by using the knowledge management model in the company; developing the value of high-tech business model, which is a constituent part of its technological innovation implemented in the internal and external markets. The significance of the business model, according to the authors', is its compliance to the modern requirements for the business models of science-intensive enterprises.

For the high-tech businesses functioning in the Russia market, it is necessary to implement the complex of measures:

- 1. to focus on the explicit and implicit knowledge management process. The former is patent management, the latter is business models and know-how management;
- 2. to eliminate limitations on age of the high-tech company for their participation in ratings, technological platforms, etc.;
- 3. to form the own patent base within "TekhUspekh" (Russia), with high-tech sphere dominating for the Russian companies. In particular, to propose creation of a unite patent base for Russia and China;
- 4. to consider the possibility to patent business model as a sequence of material actions with material objects;
- 5. to implement scientific principles in explicit knowledge management for high-tech businesses, namely: analysis of inventions' citing by other organizations, including foreign ones.

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BIOECONOMY'S POTENTIAL FOR DEVELOPMENT AND COMMERCIALIZATION OPPORTUNITIES FOR BIOSPHERE PROJECTS IN RUSSIA

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ABSTRACT

The article contains theoretic and practical study of development of the Russian bioeconomy at the modern stage. Depletion of mineral resources, adverse climate changes, population growth, environment pollution, and other factors make it necessary to ensure mechanisms of sustainable development, and act as the main incentives for development of bioeconomy based on use of renewable resources and technologies of their processing. That is why the most important task for development of the market of biotechnologies is to ensure provision with renewable resources of such economic sectors as: medical, food, and chemical industries, agriculture, ecology, maritime industry and forestry, etc.

In turn, the most effective way of promoting biotechnology results is mutually beneficial commercial interaction of all participants in the transformation of biotechnology results in a marketable commodity. This process is called commercialization. In it, all participants of the innovation process are interested in achieving rapid commercial success of biotechnology.

However, for the commercialization of biotechnology development requires targeted and systematic actions by the government and the private sector (tax and customs regulations, legislation to ensure fair competition, protection and enforcement of intellectual property rights). The need to develop innovative infrastructure and professionally trained specialists subject to these conditions the commercialization of biotechnology will be an effective and economically viable.

Key Words: Biotechnologies, Bioeconomy, Renewable and Non-Renewable Resources, Economy, Commercialization.

INTRODUCTION

The performed analysis showed that major problems faced by the modern society are: population growth and subsistence support; development of health care services; depletion of vital power, water and land resources; environment pollution; and processes of climate changes. These issues serve as an objective precondition that in the 21st century biotechnologies will become one of the crucial factors of social and economic development of the states. Use of achievements in biotechnologies not only results in creation of new products and services but also entails principal structural changes in the economy and social life.

In terms of the level of biotechnologies, Russia is currently inferior to the majority of leading countries of the world; its share in the global biotechnological production amounts to less than 0.2%. Therefore, it is possible to distinguish major preconditions for development of biotechnologies in Russia: growing demand for biotechnological products; modernization of

industry and agriculture, ensuring sustainable development of Russian economy; risk of loss of traditional sales markets and devaluation of main export products due to their replacement with products based on renewable resources; need for prevention of population movement and creation of new working places in certain regions, in villages and monocities; and huge stocks of renewable biomass in Russia.

The goal of the research is to develop theory, methods and practical recommendations contributing to development of bioeconomics in modern conditions. Information base of the research includes official federal and regional data. General scientific principles and methods of research providing for study of economic relations and phenomena in terms of their development and interrelation served as the methodological basis. General scientific and special research methods like analysis, synthesis, induction and deduction, logical, package and system approaches to evaluation of economic phenomena were applied.

THEORY

At the modern stage, the products made from natural raw materials replace mineral (organic) resources on a large scale. This trend may be characterized as the beginning of great replacement: transition to the economy based on biological components or, in other words, development of the bioeconomy.

Speaking about development of scientific basis of the bioeconomics, works of L.R. Brown, S.N. Bobylev, D.A. Dikson, V.V. Ivchenko, G. Lyubchenko, O.E. Medvedeva, S.I. Nikonorov, N.V. Osetrova, L.F. Skura, V.A. Teplitsky, V.V. Shevchenko, L.S. Shekhovtseva and others should be mentioned.

The term "bioeconomics" is considered as a science formed at the junction of the biotechnology and the economics or as a field of knowledge at the junction of the ecology and the economics that studies relations of humans and the nature in the course of use of natural resources. As a sector of economy, the bioeconomy means the economy based on the systematic application of biotechnologies using renewable biological materials. The major components of the bioeconomics are development and mastering of genome, post-genome and complex cell technologies for production of new products and processes, use of renewable resources of biomass for the purposes of sustainable production and environment protection, and integration of biotechnological knowledge and applications in various economic sectors.

R.G. Vasilov, President of the Russian Society of Biotechnologists named after Yu.A. Ovchinnikov, defines the bioeconomy as the economy based on extensive application of biotechnologies using renewable biological resources for production of valuable products and energy.

High hopes are put on the bioeconomy by governments of many countries such as the USA, China, Brazil, and Russia as well as the Organization for Economic Cooperation and Development (OECD) and the European Commission. Reference to scientific institutions and scientists that lay the foundation for the new direction in the global economy should be also made here. At the modern stage, the issue of the bioeconomy development is under formation as transition to it requires both scientific and experimental research. It is explained by the fact that the key element of the bioeconomy is integrated advanced processing of biomass and organic wastes including production of different target products (for food, feed stuff, materials, chemical agents and power: fuel, electric energy, heat). Herewith, any types of renewable materials including food crops, forest cultures, non-food biomass, wastes of agriculture, housing and utilities infrastructure, industry and even carbon dioxide of emissions from industrial enterprises

may be used as the original stock. The strategic objective for development of bioprocessing is to replace products made from mineral resources (petrochemistry) with products from renewable raw materials. In the course of bioprocessing, the original stock is transformed with the use of a complex of technologies including both conventional biotechnological approaches and the most recent developments based on achievements of the molecular and the synthetic biology, the metabolic engineering, the bioinformatics, methods of the high-performance analysis, and nanotechnologies.

RESULTS

The transition from mining non-renewable resources to harvesting renewable resources in order to produce an input can drastically change the economics of businesses that produce a product, such as energy. An oil company has high search costs and high initial investment but, once a well is discovered, it will have relatively low variable costs. These variable costs may increase over time as the stock decreases and is eventually depleted.

However, if fuel is produced with a renewable system, such as biofuel, then there is an even larger initial investment, which goes toward expenses, such as purchasing land and building a refinery to convert the feedstock into fuel. However, due to the renewable nature of the system, the output remains constant or may even increase over time. In addition, variable costs may decline over time because of technological changes. The profile of expected earnings for a given investment I is shown in Figure. 1. The transition from a non-renewable to a renewable resource becomes more profitable as the search cost for the new wells of non-renewable resources increases and the cost of conversion from renewable resources to a final product declines with research and development [1].



Figure 1 PROFITABILITY PER UNIT OF TIME UNDER BOTH SYSTEMS

Both systems require an initial period of investment followed by the period of production. The (expected) net profit per unit of time under the non-renewable system is \prod^N . Note that, for an early period, where $0 \le t < t_0^N$, \prod^N is negative and, when $t_0^N \le t < t_1^N$, \prod^N is positive. After t_1^N , it is no longer profitable to mine the resource. Let us consider a traditional renewable resource system where profit per unit of time is \prod^{R_0} . Let us assume that the renewable technology requires a larger investment but, once in operation, it continues to deliver profits. Thus, firms invest in the renewable system during the initial period, $0 \le t < t_0^{R0}$ but, after t_0^{R0} , they continue to operate the system indefinitely. There is obviously a difference in the time profile of renewable versus nonrenewable resources, and long life expectancy of non-renewable resources may make investments in them attractive, especially during periods of low interest rates. If social discount rates are smaller than private interest rates, there will be underinvestment in renewable resources without intervention. Furthermore, if the non-renewable resource generates more pollution than the renewable resource, then taxation of environmental externalities may make investment in renewable resources more attractive.

There is nothing morally wrong with the use of non-renewable resources as long as the net social benefits considered (including externalities) justify it. We expect in most cases to observe an "internal solution" where both non-renewable and renewable resources are utilized. Consider the case where a product can be obtained by renewable and non-renewable production. The non-renewable quantity produced at period t is X_t^N and the renewable quantity is X_t^R . Let $MSC_N(X_t^N)$ and $MSC_R(X_t^R)$ denote the marginal social cost for non-renewable and renewable quantities, respectively. Each of these marginal social costs is the sum of the marginal production of each quantity $(MC_i (X_t^i)$ for i = R, N) plus the user costs $(MFC_i (X_t^i)$ for i = R, N) - user cost is the marginal discounted future cost of extracting or harvesting in period t - plus the marginal externality costs of quantity extracted or harvested in period t denoted as $(MEC_i (X_t^i))$ for i =*R*,*N*). Thus [2]:

 $MSC_i(X_t^i) = MC_i(X_t^i) + MFC_i(X_t^i) + MEC_i(X_t^i)$ for i=R, N(1)

Along the optimal path, the quantities of the renewable and non-renewable resources produced are determined so that their marginal social costs are equal and both are equal to demand for the two products denoted by $D(X_t^T)$, where total output is $X_t^T = X_t^N + X_t^R$.

Thus, along the optimal path [2]:

 $MSC_N (X_t^N) = MSC_R (X_t^R) = D(X_t^N + X_t^R)$ (2) The optimal outcome is depicted in Figure 2, where total quantity, X_t^T , is determined where demand and the aggregate social marginal costs intersect (point A) and set a price, P_t . The optimal quantity of renewable resources harvested and non-renewable resources mined are depicted at points B and C in Figure. 2. Because of the decomposition of the marginal social costs, the externalities associated with the renewable and non-renewable resources will affect the optimal level of products yielded from the two resources.

Figure 2 OPTIMAL ALLOCATION BETWEEN RENEWABLE AND NONRENEWABLE RECOURCES



Fig. 2. Optimal allocation between renewable and nonrenewable resources.

Recycling can be interpreted as another form of renewable resource use. The stock of used products (used cars, recycled paper products, etc.) is processed to produce outputs that would otherwise be produced from inputs that are mined or harvested. Optimal recycling levels are found when the marginal social cost of recycling reaches the marginal social cost of supply by mining or harvesting. As the stock of extractable resources declines over time and the stock of used products increases over time, the importance of recycling increases [3].

DEVELOPMENT OF BIOECONOMY IN RUSSIA

Development of the biotechnological branch in Russia and development of processing using renewable resources set new tasks and require building new relations between scientists performing basic and applied research, production and business enterprises as well as innovative structures capable of efficiently arranging for their interaction [4].

New programs for development of regions with due account for available source of raw materials for the biotechnological industry currently started to be implemented in Russia. Provision is made for creation of new working places, possible development of monocities, development and exploration of Siberia and the Far East, innovative modernization and transition to a new technological structure, development of infrastructure, creation of biotechnological basis for production of products for the chemical industry, recovery of agriculture, and improvement of demographic situation in distant regions and in villages. Therefore, taking into account the above, it may be concluded that the main trend in development of the biotechnology in Russia is development of regions through development of the biotechnological industry [5].

By Resolution No. 180 of the Cabinet of Ministers of the Republic of Tatarstan of March 24, 2010, Development of the Biotechnology in the Republic of Tatarstan in 2010-2020

target programs was approved. The amount of the program financing totals to RUR30 bln including funds of the federal budget in the amount of RUR3 bln (10%), funds of the consolidated budget of the republic in the amount of RUR6 bln (20%) and funds of extrabudgetary sources in the amount of RUR21 bln (70%).

Biotechnological Complex for Advanced Processing of Grain project is a major one in the agricultural bioeconomics. The project provides for construction of a plant (modernization of operating facilities of branches of Tatspirtprom, OAO) in the territory of the Republic of Tatarstan with the capacity of 400 thousand tons per annum in terms of raw materials - grain, and production of a number of import-substituting bioproducts in great demand (malt syrup, feed sugar, etc.).

Moreover, work on the following projects is in progress:

- 1. Industrial production of bioproducts on the basis of Pervomaysky and Shumbutsky Spirit Plants: the project provides for reorganization of non-profitable branches of Tatspirtprom, OAO, to create Biotechnopark, and to produce commercial products. In the course of implementation of the program, project for arrangement for production of lysine became particularly relevant;
- 2. Prospects for use of EcoEnergy and Herman Ravema biogas plants for processing agricultural waste and improving ecology in the Republic of Tatarstan: the republican pilot project provides for creation of a biogas station at the pig-breeding complex, Altyn Saba, OOO (regional center Bogatye Saby);
- 3. Processing of low-quality wood and waste of timber industry complex of the Republic of Tatarstan: the project provides for processing of low-quality wood using thermochemical methods to convert it to liquid products.

Moreover, the program for development of the biotechnology in Tatarstan includes construction of two biopharmaceutical plants which will produce the latest anti-infective, cardiological, oncological and other medical products in the amount of 100 mln packages per annum minimum. A center of biomedical technologies will be created. Here projects relating to personalized medicine, cell technologies and other issues will be developed and implemented in practice [6].

At the first stage of program implementation (2010-2015), a biotechnological cluster involving at least 100 enterprises will be formed. At the second stage (2016-2020), a bioregion involving 100 percent of regions of the republic will be created on the basis of the biocluster. The expected share of biotechnological products will amount to 3-5% of the GRP. Implementation of the program will offer at least 10 thousand new working places. The program financing amounts to about RUR30 bln including 10% allocated from the federal budget; 25%, from the consolidated budget of Tatarstan; and 65%, from extra-budgetary sources [7].

CONCLUSION

New discoveries in various fields of science result in emergence of the bioeconomics where main methods of the biotechnology are used to produce a wide range of products, and to improve environmental quality. Emergence of the bioeconomics is related to transition from systems of non-renewable resources to the renewable ones. The research proved that use of renewable resources and their processing may be more cost-effective than use of non-renewable resources. However, there is no point in leaving them out as their joint use also gives positive results. However, evolution of the bioeconomics requires continuous public investments in research and innovation, support in the regions as well as creation of new financial mechanisms which will result in continuous investments of the private sector in development and commercialization of new products.

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CORPORATE INTEGRATED REPORTING: AN EFFICIENT TOOL OF ECONOMIC SECURITY MANAGEMENT

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ABSTRACT

The article is devoted to the practical aspects of the corporate integrated reporting impact on the system of economic security in comparison of a Russian and a foreign companies; it describes a company's economic wellbeing dependence from both financial and non-financial factors, most of which are included in the corporate integrated reporting lists; defines indicators of economic security on the basis of corporate integrated reporting and suggests an evaluation method of general non-financial economic security level. The goal of the article is to present corporate integrated reporting as an efficient tool in managing the economic security of an enterprise.

KEY WORDS: Corporate reporting, economic security of the company, economic security system, stability of the company, management.

INTRODUCTION

As world practice shows, the economic security of the company is always a guarantee of independence, the condition of stability and efficiency of the company. Therefore, the economic security is one of the most important priorities in the work of any company.

Currently, when the conditions of the Russian economy are described as a period of depression, as well as in connection with the restrictive bilateral economic sanctions between Europe, Russia and the USA, the stability of the company becomes the most important factor of the country's sustainability. This factor inextricably linked to the economic policies of the organizations. Along with all the internal and external aspects, the increasingly important role is now played by the system of economic security as a prerequisite for the positive dynamics of the company's development. This category has attracted much attention of researchers who analyzed the forms of its manifestation, characteristics and performance [1]. However, it should be noted that the system of economic security need tools of its functioning. A key tool is the reporting statements, as an objective source of information about companies' activities.

Disclosed financial information now often becomes the subject of wide discussion, very few data constitute a trade secret status. Moreover, the amount of non-financial information disclosed in the financial statements is constantly increasing. All mentioned above reinforces the role and significance of corporate reporting attracting additional investment cash flow and at the same time exposing the weak points of a company in public. Therefore, a large number of points, both in terms of building a corporate report and the principles of its formation, remain controversial and require further research.

Thus, provision a controlled development of the company is a complex and very important management task that should be carried out by establishing economic security system

[2]. Moreover, corporate reporting as the most comprehensive and objective source of both financial and non-financial information may become the analytical framework of indicators for these purposes.

METHOD

Corporate reporting today is widely used in the practice as the leading world system of high quality, accessible and binding global standards for presentation of transparent and comparable financial information [3]. The main objective of corporate reporting is to give an objective, accurate information about the economic situation and financial results in dynamics that are necessary for making various management and economic decisions.

Given that the financial statements are the only source of systematic economic data about the company, it is obvious that such information is widely used for the management of the economic security system.

Today preparation of corporate reporting standards is based on the principle of transparency, making it more of "anti-crisis" reports as an effective tool for ensuring economic security.

Defining the concept of economic security company, we should cover all areas of production and economic, financial and commercial activities. The greatest effect is achieved when all the used tools, methods, and events will be combined into a single coherent system - a system of protection of economic interests.

Thus, the definition of economic security of a company can be formulated as a condition of protection of its vital objects from the real and potential threats under certain objectives of the system of economic security in relation to the specific operating conditions [4].

Economic security is characterized by a set of qualitative and quantitative indicators, the most important of which is the level of economic security itself. It is an assessment of the use of corporate resources as an integral set of several indicators of economic security. To achieve the highest level of economic security, management must anticipate and prevent possible threats and quickly resolve the problems, in other words maintain the highest possible safety of the major functional components of their work.

The level of economic security is conveniently controlled by a number of criteria for assessment of its effectiveness. Such criteria should not only ascertain the presence or absence of economic security of a company, but also should estimate its level. If the purpose of these indicators is cut only to the determination of the fact of economic security, then we inevitably get subjectivity in our evaluations. However, a quantitative assessment of the level of economic security should be made with help of indicators that are used in planning, accounting and analysis of the company. It will become a prerequisite for the practical use of such an assessment [5].

As among the sources of analysis and evaluation of economic security economic data takes a major place, it is obvious that the method of calculation of indicators will largely determine the results. The importance of the process is to develop a standard reporting as the basis of all economic indicators.

No secret that the disclosure of information in addition to increasing the confidence of investors and creditors can have a downside - increased attention from the competitors (figure 1). In such circumstances, the question of the proper policy-making transparency is raised sharply; determining the relevance of the information to be disclosed, and methods of its disclosure.



Figure 1 CORPORATE REPORTING INFLUENCE ON ECONOMIC SECURITY SYSTEM

Preparation of corporate reporting involves the qualitative transformation of most areas of the company from investor relations to the daily operating procedures. Some companies recognize the need of restructuring, optimization of the organization, which ultimately leads to

lower costs and a positive impact on shareholders and business partners.

For example, JSC "NLMK" took the following structural and organizational changes [6]:

- 1. restructuring (the company complex structure with many «daughters» and «granddaughters» was unacceptable to show the investors) while maintaining the competitive advantage and the company's core,
- 2. independent directors' selection for the board of directors,
- 3. changes in the composition of the beneficial shareholders (there was a problem of forming transfer prices and the distribution of profits in offshore accounts).

Next, we calculate some of the indicators of economic security based on actual corporate reporting of IBM and JSC "NLMK" for 2015. In order to eliminate the influence of various units of measurement and reduce the influence of different structure groups we used relative indicators in our analysis (Table 1).

Table 1

THE DEFINITION PROPOSED BY THE FINANCIAL INDICATORS OF ECONOMIC SECURITY FOR IBM AND JSC "NLMK" ACCORDING TO CORPORATE REPORTING IN 2015

Indicators	JSC "NLMK"	Thresholds compliance	IBM	Thresholds compliance
Coverage Ratio	2,14	yes	1,86	yes
Equity ratio	0,37	yes	0,52	yes
Current liquidity	1,12	yes	1,23	yes
Return on assets	0,12	yes	0,13	yes
Return on equity	0,34	yes	0,25	yes
The proportion of current assets to total assets	0,21	yes	0,16	yes
The term structure of loans	64:36	no	12:88	yes
The level of financial leverage	1,12	yes	0,6	yes
Turnover ratio of receivables and payables	42,62 > 42,58	yes	11,7 < 16,7	yes

Source: public financial reporting of the companies at http://nlmk.com and http://ibm.com, authorial calculations

It should be noted that there was all necessary for the calculations data in the reporting of the analyzed companies, which indicates high quality of their financial statements. However, indicators of economic security have different values for the Russian and foreign practices. The gap in the values of certain parameters is remarkable; some reasons for the difference are prosed as following:

- 1. the composition and balance of the company's assets change,
- 2. various assets and liabilities are measured at fair value,
- 3. the balance sheet shows assets and financial instruments that are not present in the practice of other companies,
- 4. explanation of the statements does not reveal the content of the same indicators,
- 5. may have different goals and focus on the needs of users.

It should be noted that there is a variation of many analytical and performance indicators of the company in the Russian version of corporate reporting [7]. That significantly influences the calculation of general level of economic security.

Therefore, we consider some of the indicators of economic security of JSC "NLMK" for 2014 based on corporate reporting (Table 2) in more detail.

Table 2
ANALYSIS OF NON-FINANCIAL INDICATORS OF ECONOMIC SECURITY OF JSC "NLMK" FOR
2014

Indicators	Value	Analysis
Investment Sec	urity	
Investment	0,2 %	Current investment activity should not be underestimated.
activity index		Therefore, companies need to restructure the direction of spending available funds
Return on	15,27 %	Even a small percentage of current investment has good
investment		profitability and therefore extra attention should be spent to the
		investment activities
Innovative Secu	urity	
Return on	3 %	There is no detail on innovative products in the reporting
innovations		
Renewal of	0,1 %	The rate of renewal of fixed assets is low because of the
fixed assets		activity of the company 4 years ago, when they have already
		conducted a large-scale reconstruction of fixed assets
Environmental	Safety	
The energy	8,34 %	After upgrading much of the fixed assets, the company
intensity		switched to energy-saving mode. This will significantly reduce
		energy costs and increase the level of environmental safety
The extent of	0,25 %	The Company has a policy of caring for the environment;
releases to the		production meets all the standards and norms of environmental
environment		legislation

Source: public financial reporting of the company at http://nlmk.com, authorial calculations

Now we may suggest a way (formula 1) to calculate the general non-financial economic security level (NFESL) for a company based on the proposed indicators:

NFESL = (IA + Rinv + Rinov + RA + EI + ERE) / 6

(1)

where, IA = Investment activity index,

Rinv = Return on investment,

Rinov = Return on innovations,

RA = Renewal of fixed assets,

EI = The energy intensity,

ERE = The extent of releases to the environment.

For JSC "NLMK" NFESL index will be at 4,52%, which is an acceptable value according to the analysis results.

Let us reconsider the calculations and make it more complex by adding the adjusting coefficients (weights - W) for each indicator (formula 2). These values are estimated by the internal experts for each company individually and prioritize the importance of every indicator. Also, we must note that $0 < W \le 1$ and $\sum W = 1$.

$$NFESL = IA*W1 + Rinv*W2 + Rinov*W3 + RA*W4 + EI*W5 + ERE*W6,$$
(2)

In JSC "NLMK" we have placed the priority for the indicators in the following order: Rinv (0,3), IA (0,23), RA (0,17), Rinov (0,15), ERE (0,1), EI (0,5). So the fixed NFESL index is now at 5,05%, even higher than the previous result, which confirms the positive state of the economic security level in the company. We now may take this point as a base one, compare and analyze the future values with it.

Economic security managers need to conduct such an analysis of enterprise's performance indicators and make proposals for its adjustments. This is a fairly complex activity that requires systematization and should be managed discretely.

RESULT

Thus, we can talk about the relatively high level of economic security at the JSC "NLMK", primarily supported by high rates of return on assets and general liquidity. However, the company needs to build innovative activity and investment security; there are certain prerequisites to do that, including a substantial amount of net profit. Should be also noted that for the calculation of a number of important quality indicators we could not find required data in the reporting:

- 1. there is no detail on the share of imports of resources and the proportion of recycled materials used. Both indicators are important in their own way in the evaluation of economic security,
- 2. dependence on import goods under the bilateral economic sanctions between Russia and Europe an important factor when assessing the safety of the company and should be disclosed in the financial statements; the proportion of recycled paper in the steel industry can reach 30%, so it is important to know this figure to assess the overall level of economic security.

Indeed, economic security of the companies is dependent on the influence of the environment, which is always changing in our market economy. It is from the standpoint of protection against the negative influence of the environment the content of the category of economic security is considered [8].

If we talk about financial security, then among internal threats there should be noted financial management failures (associated with the strategy selection) or optimization of the assets and liabilities of the company (control of accounts receivable and payable, the choice of investment projects and their sources of financing, optimization of amortization, tax policy).

As mentioned above, the disclosure of information in corporate reporting entity discloses management policy. Any management action leading to adverse situations in the business, which remain unsolved in the reporting or distortion characteristics are violations of the standards. This leads to serious consequences that endanger the existence of the business (for example, credit review, removal from the stock exchange listing, the reduction of investment flows), even a company bankruptcy. Notorious examples of these events may be the stories of American companies "Enron", «WorldCom", "RideAid" [9]. In the case of the analyzed companies, management policy was disclosed fully in both of the reporting of IBM and JSC "NLMK".

Thus, the composition and the level of disclosure in corporate reporting certainly affect the quality of business management. Obviously, in this sense, corporate reporting can be regarded as an economic security tool.

Therefore, during the transition from Russian standards to corporate reporting for major companies, both financial and non-financial statements indicators significantly change, that respectively leads to considerable variation of all analytic and evaluation indicators in all aspects of business activities including economic security.

CONCLUSION

The article raises the question of conductivity of depth and comprehensive approach to ensuring economic safety of the enterprises in Russia, during the transition to international accounting standards.

In the XXI century ensuring the economic stability of Russia has become one of the most important objectives of all companies as a whole.

Corporate integrated reporting, in our opinion, is the most promising format for reporting in the existing institutional conditions. It really meets the diverse needs of a wide range of interested users for high-quality and reliable information.

Integrated reporting provides disclosure of both financial and non-financial information, which are inextricably linked to ensuring the economic security of a company. This approach makes it possible to correctly assess not only the current financial position of the company, but also the prospects for its sustainable development.

We believe that the proposed indicators to evaluate economic security for chosen industry, on the one hand, are sufficient for a clear picture of the status of the company, and on the other, do not contain redundant, immaterial and sensitive data.

In the course of the study we have identified the need for a comprehensive analysis of the problem of ensuring the Russian companies economic security in the period of transition to international accounting standards. That is an important element in strengthening the companies, ensuring their social guarantees, as well as the mechanisms of collective responsibility and democratic partnership.

Among the challenges and potential threats to economic security we have selected the following: incorrect risk management and lack of organization of the marketing strategy of the company. In the financial sector there is insufficient monitoring of the ratio of receivables and payables. Stable profit growth is mainly celebrated in raw materials sector. Most companies do not even have an individual department of economic security. And as a consequence, there is a reduction of overall competitiveness of Russian producers [10].

The business in Russia is in a difficult economic situation: inflation, payments crisis, the slow pace of growth in production, a decrease in profitability of investments, and now also the economic sanctions. All this contributes to the fact that today economic security has become as rare and precious commodity, as gold or diamonds in the Russian market, filled with a huge number of small and large businesses.

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SOME QUESTIONS OF IT CONTROL IN ECONOMIC ENTITIES

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ABSTRACT

The article studies the existing interpretations of the concept of information technology audit, gives an overview of the standards controlling this sphere. There is described the approach to the control of IT processes in accordance with the standard COBIT, offered the methods for calculating the cost-effectiveness of information technology. The article shows the interrelation of the classical models of measuring the effectiveness of indicators system used in the COBIT.

Key Words: Audit of Information Technology, IT Audit, Control Objectives for Information and Related Technology, COBIT, IT Efficiency, Maturity Model, Balanced Scorecard.

INTRODUCTION

At present, the information technology (IT) is a key factor in the survival of the business units in the fast-growing competitive environment. In the process of using information systems become more complex, consuming more and more financial, time and human resources. For their proper, departments or even service companies are created. At the same time it is almost difficult to assess the economic effect of created IT infrastructure. In these circumstances, the role of audit of information technologies (IT audit) at all levels and stages of development of the economic entity becomes more and more important, because this type of audit allows not only quickly receive systematic and reliable information to assess IT processes, but also allows to take appropriate decisions on the selection and management of IT processes. IT audit is a form of control and includes both an external and independent audit and internal audit, which is part of the financial control.

There are no special audit practice standards, which define the concept, objectives and scope of IT audit in Russia. In this regard, the audit of information technology is based on international standards and methodologies. It should be identified a number of standards that are in some way regulate this area.

METHOD

Standard Control objectives for information and related technology (COBIT) («Objectives for Information and Related Technology"), is developed by the Association of Specialists in Accounting and Information Systems Control (ISACA) and contains a methodology and standards for the management of information technology, IT Audit and IT - Security. COBIT is characterized by a focus on business requirements, process approach to IT management, control objectives to IT management processes, assessing the effectiveness of IT. A key provision of the standard is to obtain the information necessary for the organization to

achieve its objectives; IT resources should be managed by a set of naturally grouped processes. To do this, COBIT allocated 34 individual IT processes, which are divided into 4 groups:

- 1. planning and organization;
- 2. acquisition and implementation;
- 3. delivery and support;
- 4. monitoring and evaluation

The above processes are a set of objectives containing detailed control purposes. Objectives are the steps required to achieve measurable results.

COBIT is a standard approach to managing IT processes with emphasis on control. Control Objectives describe the requirements for effective control of each IT process and include:

- 1. formulation of administrative actions;
- 2. policies, procedures, practices and organizational structures;
- 3. conditions that inspires confidence in the achievement of business goals, the prevention of unwanted events whose consequences are identified and corrected.

Standard The Committee of Sponsoring Organizations of the Treadway Commission (COSO) was established in the US (and later recognized as the international). The standard contains a generalized model of internal control and risk, in comparison with which companies can assess their own management system.

Standard IT Infrastructure Library (ITIL) describes a set of processes, which are necessary to ensure consistent high quality IT services and improve user satisfaction. ITIL provides IT professionals by the knowledge and resources to be used to maintain an efficient infrastructure, at the lowest cost meeting customer needs completely.

ISO 20000 - the international standard for auditing and certification, is a generalization of the world experience in management organization and delivery business support IT services and is applicable to any organization, regardless of size and industry sector. It offers universal criteria by which one can objectively assess the company's ability under specific user requirements.

ISO / IEC 38500 "Corporate governance of information technology" - a standard that allows top management to understand and effectively fulfill their legal, ethical and regulatory obligations regarding the use of IT and carry out the assessment, management and monitoring of the use of IT in the management of IT.

Belkin AP gives the following definition of IT audit: "IT audit is part of the technical audit of the company, directly related to the control operation of information technology. Under the technical audit is usually understood to test independent experts used in the enterprise technical solutions and conclusions about the validity of data solutions and related information systems and processes with the requirements of regulations ".

In this context, in our opinion, IT audit should include procedures such as: inventory of audit objects (hardware, software, data transmission systems, information security, etc.), the collection of statistical information of the objects of being studied IT infrastructure, analysis of the IT infrastructure stateon the basis of the inventory and statistic information, development of recommendations aimed at improving the efficiency of the technical component of the IT infrastructure.

For this type of audit is characterized by small scale work and technical specialization studies. The company mayrestrict with poor management of IT processes, if the leadership does

not understand that IT strategic planning is necessary in order to achieve business goals. In this connection, the determination of Belkin AP is not exhaustive.

RESULT

Terms and model of the IT audit corresponding to management principles of COBIT, are set out in one of the main books "Audit guidelines". It describes how to inspect the implementation of each of the 34 high-level IT processes and 318 detailed control objectives. This allows the auditor to evaluate the adequacy of implemented management to system standard requirements and business objectives generate recommendations for its improvement.

The overall approach to IT audit, set out in COBIT, has a three-tier structure.

The highest level is represented by the following elements:

- 1. COBIT Framework, determining the overall conceptual system and including a classification of IT processes, information criteria and description of IT resources;
- 2. requirements for the audit process itself;
- 3. generic requirements for IT process auditing;
- 4. general principles of control.

The second level is to determine the stages of the audit and the formulation of detailed instructions on audit of particular IT processes, which the auditor complements and specifies in order to bring them into line with the specific terms of the audit and the characteristics of the study information system. "Audit guidelines" provides detailed instructions for each of the 34 IT processes. Actual management objectives should be based on the current needs of the organization.

At the third level, detailed instructions are supplemented by the following factors:

- 1. sector specific criteria;
- 2. industry standards;
- 3. platform specific elements;
- 4. detailed control techniques employed.
- 5. IT audit procedures on COBIT includes four successive stages:
- 6. identification and documentation (includes the collection and primary analysis of information);
- 7. evaluation of control mechanisms;
- 8. compliance test;
- 9. detailed testing.

The objective of "identification and documentation" phase is that to examine IT processes and determine the opinion of management regarding the level of management and control of IT processes. At this stageit is revealed: who controls the IT processes, where and when is happening IT process, the initial data for IT process and expected outgoing data, approved control procedures in the company.

The objective of "evaluation of control mechanisms" phase is to evaluate approved in the procedures and controls the company, to determine whether they provide an effective control environment. As a result of this step it is necessary to make the following conclusions:

1. whether comply approved procedures with the legislation and industry standards;

- 2. whether provide an approved control procedures by appropriating control over IT procedures;
- 3. whether there are alternative control measures similar to IT processes;
- 4. whether control measures and a set of approved alternative form a control environment.

In addition, the overriding objective of this step is to identify the IT processes that are necessary to be tested for compliance

The objective of "compliance tests" phase - verification of compliance of the approved control procedures by company. At this stage it is necessary to compare used control mechanisms with a set of stated and alternative ones, and determine whether the applicable real control procedures are continuously and properly. At this stage, it is determined the degree of specialization of detailed tests.

The objective of "detailed testing" phase - is collection of the necessary test data to support or refute of achievement of the control objectives.



Figure 1 THE OVERALL APPROACH TO IT AUDIT IN ACCORDANCE WITH COBIT

According to this approach, the general scheme of the audit (in the figure - «General Audit Guideline») includes four phases: identify, evaluate, test, substantiate. To evaluate the achievements of each of the 34 management tasks "Detailed instructions for Audit" is used (in the figure - «Detailed Audit Guideline»).Development of strategy and planning of audit procedures is carried out according with the general requirements (in the figure - «Audit Process Requirements»). During the audit it should also be considered "«Control Observations»" (in the picture - «Control Observations»). In addition, in all the above documents conceptual system and model relationships between business goals, IT processes, IT resources and information criteria and objectives of management, defines the methodology COBIT is used (in the picture - «Control Framework») (Alexander Astakhov, 2003).

Using COBIT methodology as a basic method of IT audit has several advantages:

- 1. priority of audit procedures and audit boundaries are determined by taking into account the studies using primary and secondary criteria analysis;
- 2. allows targeted research that is practically impossible without the methodological approach;
- 3. the role of interviewing as part of this methodology allows the auditor to understand the logic of IT processes;
- 4. obtained data, during the audit, allow us to focus on indicators which are most characterize each IT process;
- 5. methodology determines the strategy of IT auditwhich guarantees complete coverage of the audit and regular obtain audit consultations.

However, the use of this model has some disadvantages:

- 1. change never comes easy;
- 2. significant detail denature makes the initial applications cumbersome, especially when checking the completeness and applicability of the control objectives;
- 3. requires a degree of repetition audit procedures, since one purpose of the control mechanism rarely equals one, often one control mechanism is used to accomplish several objectives of control, and vice versa:
- 4. enforces some formalism.

Summarizing the above, we note the value of IT audit as a high-level independent examination of the decisions and proposals for optimization, and at the same time planning tool for the company. IT audit can be an indispensable tool for those who need a qualified expert assessment of the state of information technology, it is necessary to optimize costs, develop a strategy for the organization.

For example, when making a decision on the need to implement an information system, there are questions of a strategic plan for the organization, the place and role of information systems in this respect, the prediction of problem situations, optimizing IT investments which solution can help IT audit. IT audit results allow evaluating the work of contractors, to identify shortcomings. At the stage of information systems functioning it's interestinganother information: whether applied IT goals and objectives of the business correspond each other, whether the business has not turned into an appendage of the information system is to reduce the cost of ownership of IT infrastructure, such as optimal use of existing IT in business development. In the event of malfunction of the IT it is necessary to know what to do in case of an emergency situation, how to identify and isolate problems. You need to understand how to deal with security and access control in the organization. IT audit can substantiate, for which requires the purchase of additional equipment and software, or upgrading and assess the need for investment in employee training of IT department.

As one of the priorities of IT audit is improving the state of information systems by improving the efficiency of management, it is expedient to introduce techniques for evaluation and measuring of the economic efficiency of IT.

It should be understood that the cost-effectiveness refers to the effect on one cost, ie, ratio of economic benefits to the costs of implementation and operation of information systems. Under the economic impact should be understood calculation of business profits, which is the result of business. It should be noted that economic efficiency may be denoted as the ability of the system during its operation to give an economic effect (potential efficiency), and thus provide a real creation of such an effect (actual efficiency).

Make an objective view of their own level of efficiency is difficult. The company must, firstly, to assess its current state, and secondly, to determine the "thin" places where improvements are needed and third, to introduce tools for monitoring changes.

To implement the above objectives COBIT provides:

- 1. maturity model for comparative analysis and to identify needed improvements;
- 2. evaluation of the effectiveness of processes based on the balanced scorecard (COBIT 4.1 Russian edition).

Originally maturity model was developed by Software Engineering Institute and is offered to establish an effective instrument to classify and evaluate projects related to software development and to guarantee the quality in the performance of these projects. Later maturity model was modified for the purpose of IT service management and audit management processes (Audit Guidelines, July 2000).

Maturity models are designed for effective management, identify key actions that indicate what should be done to achieve the required quality and provide ways to control the correctness of the implementation of key IT processes and methods of their adjustment (Pavel Belkin Justification and usefulness of IT-audit, 2008).

The methodology on the principle of gradation of each of the 34 IT processes on the level of maturity from a non-existent (0) to the optimal (5). Description of levels given in Table 1.

The evaluation results of the company based on the model of maturity will determine:

- 1. the recent efficiency of the organization to assess at what stage an organization is today;
- 2. the recent status of best practices in the industry to compare their organization with the best organization in the industry;
- 3. strategic corporate goals to determine what results the organization wants to achieve;
- 4. the necessary measures to improve the current to the desired status.



Figure 2 GRAPHIC REPRESENTATION OF MATURITY MODEL

TABLE 1

GENERAL DESCRIPTION OF COBIT MATURITY MODELS LEVELS (Guzik Sergey Standard CobiT, 2003)

Level	Designation / description
0	Non-existent. The complete absence of any noticeable processes. The organization is not aware of
	the existence of problems that must be solved.
1	Initial / Repeated episodically and haphazard. There is evidence that the organization recognizes
	the existence of problems and the need to solve them. In this case, there are no standardized
	processes, there are approaches used in certain situations, or random cross-sectional solutions.
	Organized approach to IT management is absent, recognition of problems randomly and
	inconsistently.
2	Repetitive, but intuitive. Processes have reached a level where different employees performing
	the same task, and use similar procedures. There is no formal training and informing about usual
	procedures, responsible for the procedures lies entirely on the employee. Organization largely
	depends on the individual knowledge, whereby a high probability of errors.
3	Defined. Procedures are standardized, documented and communicated to the employees of the
	organization through training. There are requirements to follow a formal process described, but it
	is unlikely that deviations will be detected. The procedures themselves are not complex and they
	are formalized version of the existing practice.
4	Managed and measured. It is possible to monitor and assess the degree of compliance with
	accepted procedures, and the ability to take action if the processes are ineffective. Processes are
	constantly being improved and consistent standard practice. Automated tools and performance
	management process uses a limited or episodically.
5	Optimized. Processes are optimized to the level of best practices; they are based on the results of
	continuous improvement and comparisons with other organizations using the Maturity Model. IT
	is used for complex workflow, providing a means of improving quality and efficiency, as well as
	increasing the organization's ability to adapt quickly.

There is no universal algorithm for calculating the current and desired maturity level. Each company itself determines which parameters characterize the specifics of its IT processes and how to calculate the degree of influence of the selected criteria to them. In its turn, COBIT defines the following attributes, considering which you can give an opinion on the current level of maturity of the organization:

- 1. awareness and knowledge;
- 2. policies, plans and procedures;
- 3. tools and automation of the process;
- 4. skills and competence;
- 5. responsibility and accountability;
- 6. setting goals and assessing their achievement.

Note that the above attributes are aggregated, and it is expedient for the organization yourself to determine the priority criteria. For example, to determine the level of maturity specific business goals, the individual conditions in which the organization operates, or industry practice may affect.

The calculation of criteria may be determined by: the proportion (%) of (pieces, currencies, hours / days / weeks), qualitative assessment.

When assessing the desired result in terms of the model it is necessary to consider that the effectiveness of the process depends on the level of maturity is nonlinear. Thus the cost of providing maturity does not grow linearly and exponentially. As can be seen in Figure 3,

raising the level of maturity from 2 to 3 and from 4.5 to 4.8 would be disproportionate to the costs.



Figure 3 GRAPH OF RISK AND COST CORRELATION OF THE LEVEL OF MATURITY

COBIT maturity model provides a measure of how well management processes are developed. It shows the deficiencies in the management of IT processes and allows setting a goal of further development. Maturity model shows the evolution of the management and control of IT processes from the current to the desired. Increasing the level of maturity leads to minimize the risks and increase efficiency, reduce errors, more predictable processes and more efficient use of resources (International Standards of Auditing and Quality Control, 2012).

During the practical application of BSC, organizations are faced with a number of challenges. Among them are:

Problems with the choice of strategic objectives:

- 1. defining incorrect focus, which creates a false impression of the performance, which does not correspond to reality;
- 2. there is no sense of purpose in the future, made a focus on short-term indicators;
- 3. taking only financial targets and indicators.

Problems associated with the choice of indicators:

- 1. no connection between indicator and the company's goals;
- 2. too many or too few parameters;
- 3. selecting indicators, the measurement of which is more expensive than subsequent result;
- 4. indicators are contradictory.

Problems associated with the human factor:

- 1. in determining the index the opinion of the Executivedoes not take into account;
- 2. at default of planned values indicators, manager looking for the guilty, not the cause of the failure;
- 3. indicators are measured regularly;
- 4. collecting unreliable or conflicting information that allows for random interpretations.(Dzhumigo N.A., 2009)

CONCLUSION

Summarizing the foregoing, the four components of BSC allows to achieve a balance between strategic and short-term goals, between desired outcomes and factors to achieve them, between hard objective and softer subjective criteria. Balanced system, in spite of the diversity reflects the commonality of purpose, as all its parameters is aimed at achieving a common corporate strategy (Kaplan, R. S., 2003; Seredenko E.S.Seredenko N.N., 2011).

Today there are many methods of evaluating the effectiveness of IT. However, it should not be limited only by the economic component. In addition, it is necessary to assess the impact of information systems on customers and partners, on the image policy of the company, to take into account the company's prospects in the market and internally - for employees, increase the transparency of the company. Also, keep in mind that any method of evaluating the effectiveness is costly, and results of the evaluation demands qualitative analysis.

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