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Contents

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Socio-Economic Systems' Competitiveness Assessment Method

Victor O. Moseiko[1], Sergei A. Korobov[1] & Daniil P. Frolov[1]

[1] Volgograd state university, Volgograd, The Russian Federation

Correspondence: Sergei A. Korobov, Department of Management, Volgograd State University, 400062, Volgograd, Universitetsky Prospect, 100, The Russian Federation. Tel: 7-844-240-5519. E-mail: korobovfamily@mail.ru

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Abstract

Globalization of modern economics forms new economic challenges in order to improve Russian regions' competitiveness. The regions' competitiveness significance grows substantially under conditions of the regions' historically formed economies' focus; current nature resources use potential and the advantages of the regions' geographic location for external economic cooperation. Considering these facts, current research suggests a new method of assessing the socio-economic systems' competitiveness. The authors suggest using the socio-economic system's competitiveness integral index as the basic competitiveness assessment means. This integral index comprises 4 indicators, defining the system's functionality, system, proactiveness, and organicity. It is suggested to form private competitiveness indices in long-term and short-term periods in order to assess the system's competitiveness dynamically. The private competitiveness index in short-term period comprises indicators, defining the functionality and system levels, and the private competitiveness index in long-term period comprises defining the proactiveness and organicity levels. Several economic magnitudes, interpreting the functionality, system, proactiveness, and organicity indicators are presumed for interpreting each of them. A broadened spectrum of economic magnitudes, used for interpreting the assessment indicators, facilitates the involvement of various statistic and empiric data.

Keywords: Adizes, competitiveness, region, regional economy, socio-economic system

1. Introduction

In terms of a long-term systemic crisis and general economic stagnation, competitiveness becomes especially important. The differences in regional reproduction potential level (natural resources, production capacities, work force, and transport system density) become evident in terms of a general economic crisis and overcoming its consequences.

All this makes the competitiveness a primary factor for Russian regions in terms of their successful socio-economic development and national economy reorganization. For a region, as a subject of competitive struggle, achieving competitiveness means, on the one hand, the possible development efficiency increase and, on the other - a right to take a deserved place in the federal government system and to promote the country's economic growth.

2. Background

A methodical approach to assessing different levels of socio-economic systems' (further-systems) competitiveness is viewed in the current research. The method's object universality gives the opportunity to apply it to the assessment of competitiveness of different enterprises, sectors, and regions.

To begin with, we would formulate critical remarks to the content of many methodic approaches to assessing regions' competitiveness.

First of all, each method offers a certain list of indicators, the number of which is always different (Camagni, 2002; Porter, 2003; Gardiner, Martin, & Tyler, 2004; Annoni & Kozovska, 2010; Bristow, 2012). When proving the necessity to use certain indices, the authors of assessment models have well-grounded reasons, as the necessity to use an index is based on a correlational connection between the indices' value and the extent to which the competitive advantages occur. This leads to formation of ungroundedly large number of indices in different methods, which doesn't allow formulating clearly the grounds for suggesting its increase in the regional

competitiveness assessment process. Secondly, an essential feature of most competitiveness assessment models is that the values of assessment indices significantly depend on the external environment conditions. For example, that's why these models - in terms of crisis - very often show a competitiveness level sustainable decline of the regions' economic activity. On the other hand, it is clear that when the changes in external environment affect all market participants equally, their competiveness regarding each other in terms of stable internal conditions may remain the same (Hudson, 2006; Atkinson & Correa, 2007; Diamantopoulos, 2008; Huggins, Izushi, & Thompson, 2013). When the internal conditions within the producers of a certain product remain the same, the external environment changes may not change these producers' competitiveness ratio or the produced goods' ratio.

Thirdly, correlational dependences, that could be observed between the corresponding indexes and indicators, which is characteristic of all methodic approaches (for example, Huovari, Kangasharju, & Alanen, 2001; Begg, 2002; Huggins, 2003; Anholt, 2007; Wintjes & Hollanders, 2010).

The assessment of regional competitiveness is conducted by comparing the numeric values of the corresponding indicators. When making such comparisons of interrelated indicators and indices, the possibility of getting a deliberately incorrect result at the expense of overlaying several intercorrelating tendencies increases, especially when the assessing experts are offered to use a big number of indices and indicators in the assessment model.

Fourthly, the content of assessment methods is built on the basis of the following logic. The expert formulates exact indicators or indexes. The economic value (category) becomes an assessing indicator, if the socio-economic system competitiveness growth (including regional growth), in the expert's opinion, leads to the alternation of this indicator. Besides, the more intensive this interconnection is and the more intensively the competitiveness leads to greater economic category changes, the more the expert regards it as an assessment indicator.

Thus, in all assessment models, the cause-effect relation is built in accordance with the following logic: region's competitiveness growth *is the cause* and *the effect* of the indicators' alternation.

On the other hand, the grounding or the selection of solutions for increasing competitiveness is the most predictable and significant result of applying all assessment models to studying regional competitiveness. Assessing a region's competitiveness should not be an end in itself. The assessment should promote the solution for defining corresponding management activities, the implementation of which should lead to regional competitiveness growth. In this case, the conclusion's logic should contain the following cause-effect relation: management activities and, consequently, the change of the corresponding indicators is *the cause,* and the competitiveness growth is *the consequence*. It is obvious that this statement should generally determine the logic of competition management and assessment models.

In our opinion, this statement determines the substantial orientation of further specifications of the assessment indicators forming conditions in the competition assessment model of socio-economic systems (including regions). That's why, when forming a product's or subject's competitive assessment indicators, it is important to take into account that the process parameters for managing the production of this product are defined by their content.

3. Methodology and Materials

Methods of managing an organization, offered by a famous researcher and management consultant Ichak Adizes, are used as the methodological base for forming socio-economic systems competitiveness assessment indicators (Adizes, 2014).

According to Adizes's methodology, providing an organization's management effectiveness in long-term and short-term periods is the main condition for the organization's successful management (Adizes, 2008). We would like to describe the conditions for successful management, applying Adizes's methodological approach to socio-economic systems.

The system is effective, in case its product is produced by means of minimum financial, time and other types of resource support. The organization, which functions with smaller energy, human, financial and time costs is more effective than others. High profitability, low prime costs, and low process costs are all the features of an enterprise's high efficiency.

In order for the organization to be efficient in short-term and long-term periods, a system's or organization's management process should be targeted at implementing 4 main qualities: functionality, system, proactiveness and organicity.

A system is considered to be *efficient in short-term period*, if its *functionality* is provided during the management process. The management process is aimed at achieving results for which the system exists. Such result is the satisfaction of consumers' needs. The satisfaction of consumers' needs for certain products is the main function for which the system was created and for which it functions.

A system is considered to be *efficient in short-term period*, if its *system* is provided during the management process. In order to achieve it, the system management process should be targeted at providing systematization of all processes and building an effective management system, based on the application of administering procedures, budgeting, analysis, control, audit, monitoring and regulation, etc. All these procedures provide the system's effective functioning.

A system is considered to be *efficient in long-term period,* if its proactiveness is provided during the management process. In order to achieve it, the system management process should be targeted at constant initiation of changes in the organization, adjustment to new dangers and opportunities, and providing innovative activity. The products which the system plans to produce in long-term period should definitely possess competitive advantages. If the system strives at being competitive on the market in future, then it is necessary to create competitive products today. The management which is able to provide the system with quality proactiveness is considered to be entrepreneurial, i.e. based on initiative, strategic vision, use of innovative science and technology and so on.

A system is considered to be *efficient in long-term period,* if its organicity is provided during the management process. A system is considered to be organic when integrating dependences and links between its elements exist, allowing the system to adapt to the changes in the internal and external environment: some system's elements "help" other elements. In order to achieve it on micro-economic organizations level, the management should be targeted at disposing of irreplaceable people and at creating team cooperation, which can be provided by integrating the organization's inner environment and the integration of the organization and external environment as well. The system becomes organic on the macro-economic level (sector, region, country) as a result of system management integration cooperation between its elements and between these elements and system with the external environment.

It is worth mentioning that the organicity's quality can be observed by the example of territorial clusters' functioning, where territorial systems' effectiveness is directly provided by the integration processes, going on between organizations which form territorial clusters.

The methodology introduced by Adizes contains 4 system qualities for providing successful management. These qualities can be applied to different economic level systems, such as enterprises, sectorial complexes, regions and countries' economies.

Basing on the conducted analysis the conditions for providing successful management can be schematically represented in the table below (See Table 1).

On the other hand, competitiveness bases on the process of satisfying clients' needs by offering products, possessing competitive advantages. In this case, Adizes's methodology main principles can be applied at providing system's competitiveness.

Table 1. System's qualities, necessary for successful management

Time aspect	Successful system management aimed at providing:	
	productivity	effectiveness
Short-term period	functionality	system
Long-term period	proactiveness	organicity

It is worth saying that providing system's productivity and effectiveness in short-term and long-term periods is, according to Adizes, a condition for successful management aimed at clients' needs satisfaction. Successful clients' needs satisfaction is impossible without forming products produced by the system, competitive advantages, and without the system's competitiveness. Main conclusion algorithm can be drawn schematically (See Figure 1).

It is possible to form the socio-economic systems competitiveness assessment model and consequently clarify the assessment indicators formation process based on management prerequisites.

The significant feature of the suggested approach to assessing socio-economic systems' competitiveness is that a list of possible assessment indicators should be formed on the basis of a common complex solution, which is *successful system management condition.*

In order to provide system's competitiveness (as a consequence), this system's management should be productive and effective in short-term and long-term periods and be aimed at implementing functionality, system, proactiveness, and organicity (as the cause). It is evident that in this case competitiveness assessment indicators should prove it.

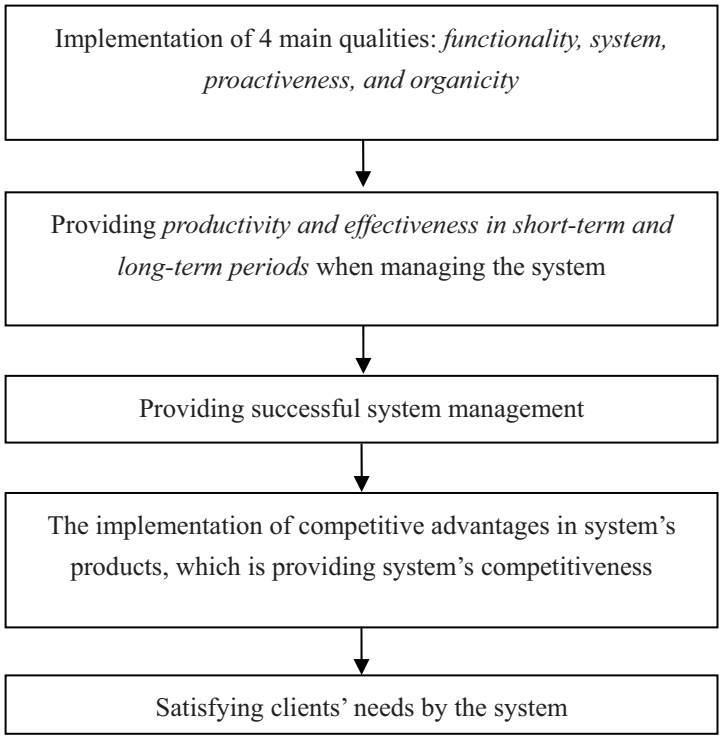

Figure 1. The algorithm of providing the system's competitiveness by its managing

4. Results

Based on this algorithm, we suggest using *integral competitiveness index* in order to assess socio-economic system's competitiveness. This index comprises 4 indicators, determining the system's level of functionality, system, proactiveness, and organicity.

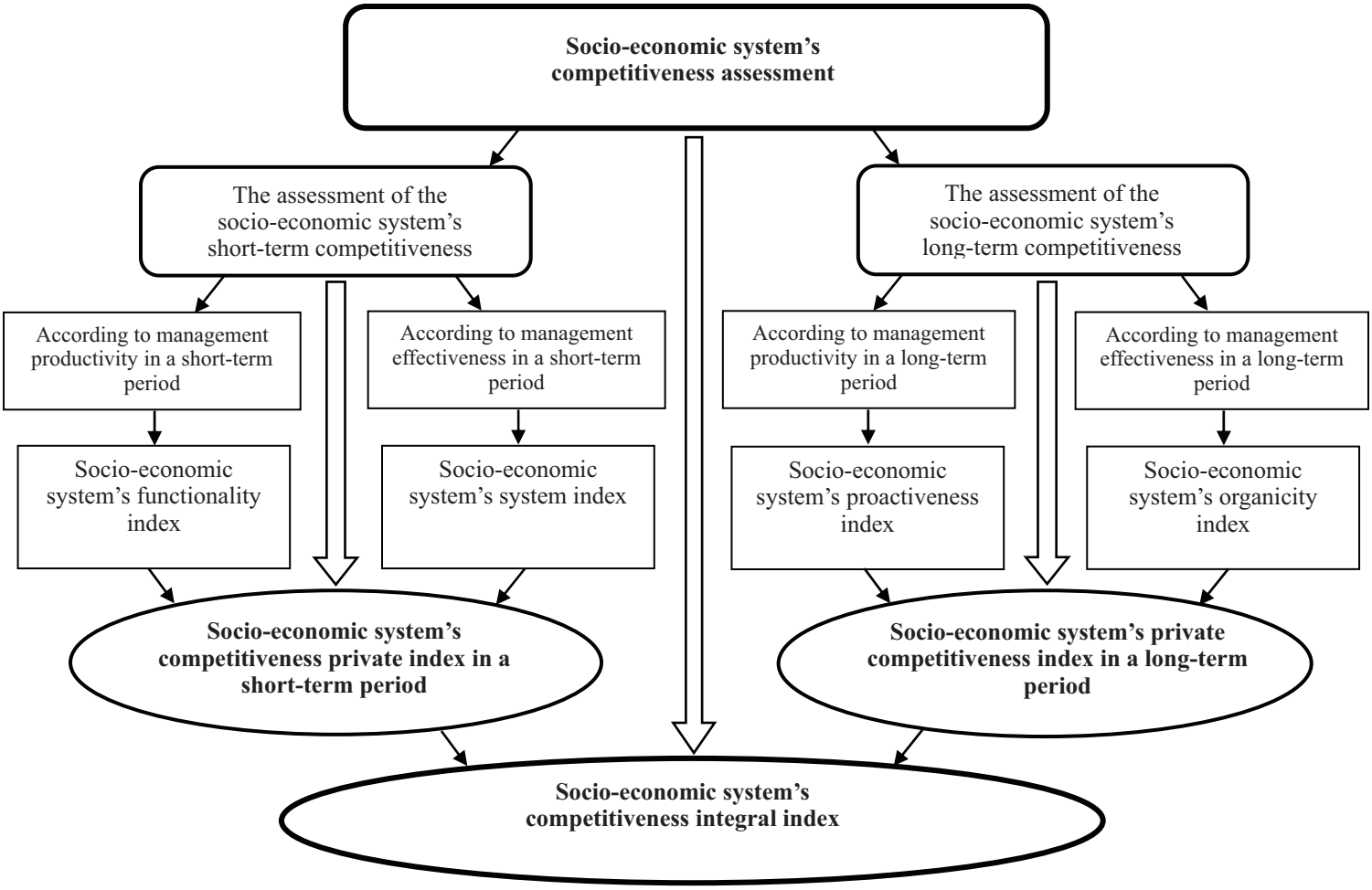

Figure 2. Socio-economic system's integral index formation algorithm

Private competitiveness indices in short-term and long-term periods are represented in the current article for the analysis and socio-economic systems' assessment to be well-grounded. Indeed, the system at the same time can demonstrate high economic rates in the current period and may not continue its efforts in the long-term period. For example, the system can fully use its production opportunities and can at the same do nothing to develop these opportunities. In this case, private competitiveness index can in the long-term period have improper value, unlike the short-term competitiveness index.

Competitiveness private index in the long-term period bases on 2 indicators which define proactiveness level and socio-economic system's organicity.

The authors of the research suggest calculating the integral and private competitiveness indices as geometric means from certain indicators intersection, forming these indexes (See Figure 2). Private competitiveness indexes will be calculated as square roots from paired intersection and the integral index will be calculated as the fourth root from 4 indices' intersection or as a square root from the intersection of 2 private indices.

We would like to draw attention to some of the characteristic features of the assessment indicators approach suggested.

First of all, one of the evident advantages of such approach is that various variants of economic values, aimed at interpreting the content of the indicator, are presumed in the content of each of the 4 assessment indicators. On the other hand, the fact that only four assessment indicators are suggested in the framework of the assessment model is regarded as a condition, initially *limiting a groundlessly big number of assessment indicators*. It is worth underlining that socio-economic systems' competitiveness is suggested to be assessed with respect to 4 indicators and to the use of the geometric means.

On the other hand, the fact that in the framework of each of the 4 indicators' common methodological definition several economic magnitudes can be presumed, and each of the magnitudes interprets each of the 4 indicators, *is presented as the assessment model's variable quality, aimed at providing this methodology invariant application to different level socio-economic systems.* In other words, the opportunity to select diverse economic magnitudes, interpreting the functionality, system, proactiveness and organicity assessment indicators, makes this approach a universal tool for assessing the socio-economic systems' competitiveness, presuming the adaptation to various application conditions and primarily to the characteristics of systems is assessed.

In fact, in order to make certain enterprises', sectors' and region's competitiveness comparative assessment, it is considered appropriate to use different economic magnitudes. At the same time, the maximum correspondence of the economic magnitudes to methodological content of competitiveness assessment indicators is the main condition.

Assessment model's variability facilitates its application, when because of the limited access to official statistical data, the search for economic magnitudes, interpreting corresponding competitiveness assessment indicators, faces problems.

Next we would like to consider the competitiveness assessment indicators' content. We will analyze socio-economic systems' functionality, system, proactiveness, and organicity indicators' content and consider possible economic magnitudes which could interpret these indicators (See Table 2).

Table 2. The content of the indicators for the formation of the systems' competitiveness indices

Name of the indicator	Methodological content of the assessment indicator	Economic magnitudes, Interpreting the indicator's content
Functionality indicator	Productivity in a short-term period – clients' needs satisfaction.	The volume of production sold. Organizations' turnover. The organization's turnover with respect to their kind of economic activity.
System indicator	Effectiveness in a short-term period – resource provision economic effectiveness.	Gross value added with respect to the number of employed. Gross regional product with respect to the number of population.
Proactiveness indicator	Providing innovation activity, Introducing changes, the adjustment to new dangers and opportunities.	The volume of innovative production. The volume of scientific research financing. Fixed capital investments.
Organicity indicator	Providing integration cooperation and partnership. The level of cooperation interdependence.	The number of enterprises' employees. The number of enterprises and organizations with respect to the kind of economic activity. The number of enterprises and organizations in the region.

The system indicator should reflect the socio-economic system's effectiveness in a short-term period, which, first of all, means its economic effectiveness in using various resources and factors in the production process.

The proactiveness indicator should reflect the socio-economic system's productivity in a long-term period, which primarily means providing innovative activity and introducing changes, aimed at adjusting the system to new dangers and opportunities.

The organicity indicator should reflect the socio-economic system's effectiveness in a long-term period, which primarily means providing integration cooperation and partnership within the socio-economic system and the cooperation between the elements of this system.

The system's integrity, primarily viewed as the interconnection between its elements, increases the system's adaptability to the internal and external environment changes and, consequently, provides system-wide competitive advantages in future. The system's high adaptability qualities allow it to provide different content of competitive advantages in its products – the one which is innovative and which attracts consumers. These

advantages can be of a consumer, cost, and innovative character. When two systems function with the same result, only the system which is more differentiated and more internally and externally interconnected will have a higher level of organicity and will have a greater number of internal elements. It is evident that a system's high structural differentiation will facilitate the minimization of the crisis adverse impact. The economic magnitudes which are more preferable for interpreting this indicator can be the number of enterprises' employees, the number of enterprises with respect to the kind of their activity, and the total number of enterprises and organizations in a region.

In this connection, the socio-economic system's competitiveness private index, calculated as the geometric mean's intersection of the proactiveness and organicity indicators, reflects the system's ability for the proactive provision of innovative advantages and integrative unity of the system's elements.

The socio-economic system's competitiveness integral index reflects all 4 indicators. The comparison of socio-economic systems according to this index can give the opportunity to make an integral assessment of the systems' competitiveness.

5. Conclusion

1. In order to provide the system's competitiveness, it is necessary for the system's management to be productive and effective in short-term and long-term periods; it should be aimed at implementing the functionality, system, proactiveness, and organicity qualities. In order to assess systems' competitiveness, it is suggested to use the integral socio-economic system's index, comprising 4 indicators, defining functionality, system, proactiveness, and organicity of the system.

2. In order to make the analysis of the socio-economic systems' competitiveness in various time perspectives, it is suggested to form private competitiveness indices in long-term and short-term periods, each consisting of 2 indicator. Private competitiveness index in a short-term period consists of indicators, defining the levels of functionality and system and in a long-term period - the levels of proactiveness and organicity.

3. The evident advantage of the suggested approach is that in the framework of all 4 indicators several economic magnitudes are presumed. These magnitudes are aimed at interpreting the content of an indicator to some extent. On the one hand, the fact that only 4 indicators are suggested in the framework of the assessment model is viewed as a condition, initially limiting an ungroundedly great number of assessment indicators. On the other hand, the fact that several economic magnitudes are presumed in the framework of each of the 4 indicators' general methodological definition is viewed as the assessment model's variable quality, aimed at providing the methodology's invariant application to different level socio-economic systems. An extended spectrum of economic magnitudes, used for interpreting assessment indicators, significantly facilitates the involvement of statistic and empiric information of various kinds.

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Entrepreneurial Activity Self-Production Conditions within Territorial Clusters

Daniil P. Frolov[1], Victor O. Moseiko[1] & Sergei A. Korobov[1]

[1] Volgograd State University, Volgograd, The Russian Federation

Correspondence: Sergei A. Korobov, Department of Management, Volgograd State University, 400062, Volgograd, Universitetsky Prospect, 100, The Russian Federation. Tel: 7-844-240-5519. E-mail: korobovfamily@mail.ru

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Abstract

The role of regional entrepreneurship is becoming the key point when forming Russian economy effective competitiveness and especially in terms of current world economic challenges, which determines Russian economy turbulence. The current research focuses on self-production conditions of these territorial systems clusters. A cluster's formation based on its members' self-production is thoroughly investigated in the research. The authors analyze clusters, their functions, and tasks definitions of economic analysis. The features of various territorial-production systems of the Russian Federation are considered in the article. Clusters competitive nature is clarified on the grounds of the analysis by using various resources and combinations of factors. An algorithm for forming business self-production conditions within a cluster is defined in the research. The research provides the analysis results of cluster business self-production formation conditions. The key integrating resource, which plays the role of a moving force for development of other resources that are necessary for forming business self-production conditions within a cluster, is elaborated in the article. On the basis of economic territorial systems with self-production features functioning analysis, the authors suggest a new economic approach to business system development by applying new cluster organization forms.

Keywords: clusters, economic development, entrepreneurship, regional economy, resource management

1. Introduction

Territorial clusters, being effective forms of territorial organization of the economic entities economic interaction, proved to be efficient since the beginning of the 20th century. Through the territorial development it became evident that territorial economic system's cluster functioning form provided successful development to regions by creating business self-production conditions within these clusters.

2. Latest Research and Publication Analysis

It is apparent that cluster economic organization should be regarded as the modern form of economic organization or economic entities' interaction in various primarily economic interaction cooperative forms. Cluster economic organization is characteristic of market economic environment and thus is a market form of cooperative interaction development, as latter implies the business entities' amalgamation around a certain functional niche, product, or service and the presence of interrelations and working relations for increasing these businesses' competitiveness.

We consider that cluster economic organization's main systemic quality is business self-production within a cluster, which distinguishes it from the cooperative interaction form. Taking this into consideration, each business entity's interaction with other territorial cluster entities depends on the entity itself and its view on such interaction economic expedience.

It is worth mentioning that if the economic cooperation was determined primarily by the inter-business directive organization forms in the framework of planned economy, then in the framework of market economy we should look for new task solutions. Cluster economic organization functions on a market, where market behavior is characteristic of all cluster members, which in general excludes any kind of concrete cluster directive management.

The presence of directive influence forms of some authority body in concrete cluster's formation and functioning creates prerequisites for such economic systems' systemic privacy. Sometimes such prerequisites may become a stagnating condition for directly formed and managed cluster systems.

3. Objectives and Methods

Current article covers the self-production conditions of the territorial economic systems, called cluster. In this article we will formulate the answer to the question of condition, which provide a cluster's formation on the basis of its members' self-production.

There is no single theory of clusters (Özcan, 2004). It is worth emphasizing that the cluster conception has a big number of explanations, ways of application and meanings in connecting various spatial processes under one universal notion. For example, Porter M. defines the industrial cluster as several sectors, connected through the seller-buyer relation or through common technologies, common purchase or distribution channels, or common labor associations (Porter, 1990). According to Schmitz H., a cluster is a group of enterprises, belonging to one sector and functioning closely to each other (Schmitz, 1992). Rosenfeld S.A. considers that a cluster is a concentration of enterprises, which can produce synergic effect, due to their geographical proximity, even though their preoccupation may not be really evident (Rosenfeld, 1997). Crouch C. and Farrell H. believe that a cluster's wider understanding implies the tendency for the enterprises to function closely to each other (Crouch & Farrell, 2001). According to Van den Berg, Braun, and van Winden, the popular term "cluster" is closely connected with the range of local or regional networks. Most cluster definitions say that a cluster is a network of localized oriented organizations which production processes are closely connected through goods, services, or expertise exchange (Van den Berg, Braun, & van Winden, 2001). Andersson T., Schwaag-Serger S., Sorvik J., and Wise Hansson E. define clustering as a process of the enterprises and other entities joint disposition within a concentrated geographical area, cooperation of a certain functional niche and within work alliances for enhancing these entities collective competitiveness (Andersson, Schwaag-Serger, Sorvik, & Wise Hansson, 2004). Other researchers (Swann & Prevezer, 1996; Bergman & Feser, 1999; Visser & Boschma, 2002; Vázquez-Barquero, 2006; Potter & Miranda, 2009; Villa & Antonelli, 2009; Monteiro, Noronha, & Neto, 2011; Wise & Johansson, 2012) adhere to this view.

Firstly, we should say that cluster conception is elastic, which obviously is an advantage if considering the conception in a broad sense. High variability in determining clusters should not be a challenge to defining prerequisites and conditions which facilitate the clusters' formation and self-production in this or that area.

Thus, most clusters are viewed as an association of functioning economic entities, united by certain technological and production relations that help these entities produce goods. Services can also be a kind of product, uniting entities.

We consider this view on cluster to be logic and well-grounded, until we try to define conditions and prerequisites for a cluster formation.

The same features are regarded as the cause and the consequence of a cluster formation, so we suggest regarding these features as the consequence, i.e. the result of a cluster formation.

It is a typical mistake to consider the presence or the absence of an association of entities, united by definite relations, i.e. interacting with each other, as the main condition or cause for clusters' existence. This assumption usually leads to wrong decisions, aimed at administrative or directive cluster formation. Nowadays in Russia we can observe examples of administrative economic cluster organization, implemented by means of decisions, targeted at primarily organization-directive transformations in a region, district, or state. Such economic entities association is nothing but an attempt to create a complicated formation by means of directive approach, which seems to be absurd in market conditions. Of course, it doesn't necessarily mean that the formations, created in this way, should be unsuccessful, because we still remember the examples of production complexes' or territorial-production complexes' centrally planned economy. Such formations effectiveness can be provided even in terms of market economy. But in the narrow sense, a cluster is territorial production complex which cannot be formed and operated directly. A cluster is an association of entities, functioning by themselves in terms of competition, i.e. it is a self-governing socio-economic system, formed by the entities' self-production. That is why directive regional government decisions on forming territorial clusters by organizing or creating appropriate research, production, and education units, may not always be a right thing to do.

If we answer the question "What is an essential condition for forming a territorial cluster or for forming business self-production within this cluster?", we will be able solve the above mentioned problem. The answer to this

question will allow conceptualizing what clusters are, what their features are, and making conclusions, necessary for building economic policy.

To find the answer to the question, we shall consider various Russian territorial-production systems, having characteristic cluster features and function peculiarities (See Table 1). The study is supposed to be implemented by quality analysis of the conditions and factors which influence the territorial-production systems formation and functioning. The analysis aim is to define the way these conditions and factors affect production systems and to define the common features of such influence for different territories.

The main methodological toolset, used for the analysis, comprises the basic key notions of the competitive theory, namely competitiveness and socio-economic systems (mainly cluster economic systems) competitive advantages.

Table 1. Territorial economic systems (cluster economic systems) examples with business activity self-production features within a cluster

№	Economic system	Essence	The main integrating resource-condition	Integrating resource interpretation
1	2	3	4	5
1	"Avtogrady" (automobile unions) in Tolyatti, Naberezhnye Chelny, Nizhniy Novgorod, and Kaliningrad.	A system, promoting cars and tying goods.	Producing cars by large car-makers.	Produced or artificially created resources.
2	Wood processing companies and complexes in Karelia, Siberia, Vologda Oblast, etc.	Harvesting, processing, and selling the wood.	Wood stock.	Natural resources.
3	Krasnodar Krai Agriculture.	Producing, processing, and selling agricultural production.	Natural-landscape and climate conditions.	Natural resources.
4	Sanatorium-resort and tourist industry of the Russian Federation Black Sea coast.	A system for promoting tourism products.	Natural and climate conditions.	Natural resources.
5	Fishing and fish-processing enterprises in Caspian, Primorski, and Baltic areas.	Fishing, processing and selling fish and fish products, necessary infrastructure.	Fish and seafood stock.	Natural resources.
6	Modern regional business incubators.	A system promoting the innovations commercialization.	Research-and-production infrastructure.	Produced or artificially created resources.
7	Metallurgical and metal-working sector of Southern Urals.	Producing, processing, and selling metallurgical production.	Producing metallurgical production by large enterprises.	Produced or artificially created resources.
8	Modern shopping, shopping-expo and shopping-entertainment malls.	A system of retail trade, leisure, and entertainment.	Trade and leisure infrastructure.	Produced or artificially created resources.
9	Vegetable-producing enterprises in Volgo-Akhtubinskaya floodplain in Volgograd Oblast (in the Soviet time).	Producing and selling vegetables (fresh and tinned).	A system of floodplain irrigation.	Produced or artificially created resources.
10	Producing fine jewelry and souvenirs in Krasnoe-na-Volge, Kostroma Oblast and Kubachi, Dakhaevskiy District, the Republic of Dagestan.	Producing and selling fine jewelry and souvenirs.	Old traditions and knowledge, passed across generations, Specialized professional personnel training.	Produced or artificially created resources.

The product's competitive advantages by nature.

A product's feature (either a material product or service) is created in the production process and is determined by the use of appropriate resources and factors.

Thus, the main (basic) production factors are: equipment and technological processes, personnel, natural and other materials, organization technologies, information and institutional support. All together these factors represent possible specific product's manufacture resources and factors.

Each production factor (and, consequently, the corresponding object, process, and condition of environment) buries certain features, qualities, and characteristics, which determine the way this factor is applied in the production process. Any economic or business entity within a cluster develops nature conditions and things which gradually become production resources and factors. The resources' and factors' competitive advantages later transform into a product's competitive advantages, which provides competitiveness for the cluster members and for the cluster as a whole. Thus, an economic entity's joining a cluster determines its business self-production within the cluster system. This is determined by an entity's tendency to get certain competitive advantages within a definite cluster. That is why finding cluster economic systems formation conditions or their business self-production conditions should be done by providing competitiveness or competitive advantages by developing new appropriate resources.

4. Results

Let us return back to territorial economic systems with business self-production features within clusters (See Table 1).

We should first of all distinguish the business self-production formation and this process's result (See Figure 1). Various approaches, methods, and tools which all together make up the mechanism for achieving the result, are used for implementing the process.

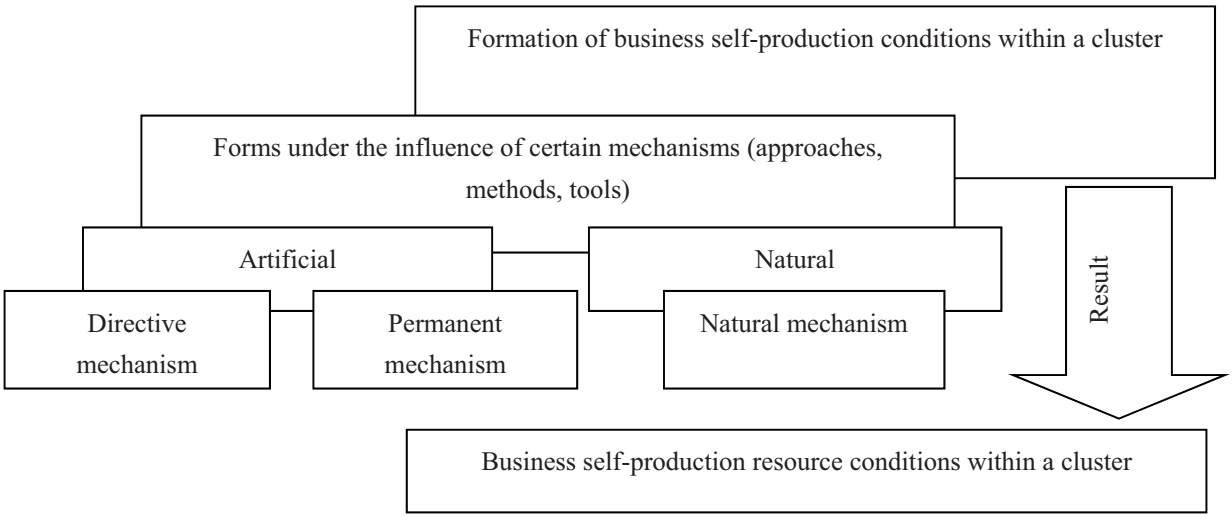

Figure 1. The formation process and result of the business self-production conditions within a cluster

As to the nature of business self-production conditions formation and its mechanism, we suppose that it's better to make a distinction between the natural and artificial (manmade) nature. In the first case, the formation mechanism may be directive or permanent and in the second - only natural.

Primarily, business self-production resources should be the result of the business self-production conditions formation.

The results of analyzing business self-production formation process and formation mechanism within an economic cluster system are shown in the table below (See Table 2).

Table 2. The nature of the business self-production formation mechanism and process within clusters

№	Economic system	The resource conditions formation mechanisms by nature
1	2	3
1	"Avtogrady" (automobile unions) in Tolyatti, Naberezhnye Chelny, Nizhniy Novgorod, and Kaliningrad.	Directive mechanism, artificial by nature.
2	Wood processing companies and complexes in Karelia, Siberia, Vologda Oblast, etc.	Natural mechanism.
3	Krasnodar Krai Agriculture.	Natural mechanism.
4	Sanatorium-resort and tourist industry of the Russian Federation Black Sea coast.	Natural mechanism.
5	Fishing and fish-processing enterprises in Caspian, Primorski, and Baltic areas.	Natural mechanism.
6	Modern regional business incubators.	Directive mechanism, artificial by nature.
7	Metallurgical and metal-working sector of Southern Urals.	Directive mechanism, artificial by nature.
8	Modern shopping, shopping-expo and shopping-entertainment malls.	Directive mechanism, artificial by nature.
9	Vegetable producing enterprises in Volgo-Akhtubinskaya floodplain in Volgograd Oblast (in the Soviet time).	Directive mechanism, artificial by nature.
10	Producing fine jewelry and souvenirs in Krasnoe-na-Volge, Kostroma Oblast and Kubachi, Dakhaevskiy District, the Republic of Dagestan.	Permanent mechanism, artificial by nature.

It is worth noting that, taking into account all factorial conditions which affect the systems' formation and functioning, it is necessary to identify the main integrating resource-condition in each example (See Table 1, column 4). This integrating condition is the key factor of the clusters' development and their business self-production. Still, it is evident that various resources, used for the territorial clusters' organizing and functioning, have a different impact on their business self-production. We should distinguish the resources which bear significant importance for self-production conditions formation. Let's consider the following hypothetic example.

The fish-processing sector in Primorskiy Krai, the Russian Federation Far East, is developing in the form of regional sectorial clusters. Is it possible for such sector to function in the Republic of Kalmykia? Obviously, not. This would be economically absurd and, therefore, impossible. The same would be if we try developing logging business in Kalmykia.

It's worth mentioning that even despite developing other essential resource conditions, such as financing, human (personnel training), and organizational (directive decisions), the establishment of a fish- or wood-processing sector in Kalmykia would still be absurd.

That is why the fish stock in Primorskiy Krai and wood stock in Karelia or Siberia are the unique resource conditions for the clusters, functioning in those areas. This is why business self-production takes place within appropriate territorial clusters, where the key resource conditions are available.

Such integrating key resource, as the production factor, works as a moving force for developing other resources, essential for creating self-production conditions (finance, personnel training, technological capability, directive decisions), but not vice versa.

As you might have already noticed, the main integrating condition can be natural and artificial by nature. In the first case, enterprises which produce goods and provide the integrating condition take the role of a cluster's nucleus on the basis of each territorial economic system.

In the second case, when natural resource is the main integrating condition, there may not be any evident cluster nucleus. Thus, there is no evident nucleus or enterprise which could integrate other cluster members in logging, fish-processing, or tourism sectors.

We also note that such approach to interpreting a process's nature or a mechanism's business self-production conditions within clusters might be rather relative.

Therefore, if we take natural integrating resources, we should not reject the importance of the impact of business self-production conditions within clusters and directive elements' significance.

5. Conclusion

The analysis of the main integrating condition's substance for each territorial economic system allows highlighting the following features of this condition (resource):

1. This resource should be equally available to all territorial economic system members (sometimes primarily including) small and medium businesses. In case there are (administrative-directive) barriers which impede this resource's development, the natural self-production condition of territorial economic system members will be impossible. In case some restrictions (ecological, humanitarian) are inevitable, they should affect all cluster members equally.

2. This resource provides a cluster's general production considerable competitive advantages. This particular resource development makes the production process, in the framework of a certain cluster, more competitive by this resource's development low costs, if comparing with the production costs in other territorial clusters. In this sense, resource's territorial-sectorial property possesses phenomenological quality.

3. The lack or full absence of this resource may be compensated by other territorial-sectorial sources. Each of the above mentioned clusters (See Table 1) couldn't have developed if there was a lack or absence of this resource; that would have led to stagnation or collapse of the cluster economic system. Replenishing this lack leads to greater costs, in comparison with other resources replenishment. It is worth saying that the lack of this resource cannot be compensated by other resources.

4. The more intensively this integrating resource is developed, the more the corresponding territorial-sectorial economic system is developed, if comparing with other resources active development. Replacing intensive integrating resource's development with other resources' active development is economically unreasonable. Thus, for instance, the development of nature-landscape resources would be of greater importance for the logging or agricultural.

5. The intensive integrating resource's development contributes to the more active development of other resources. Still, this doesn't work vice versa. Therefore, the integrating resource is multiplicative. So, it is evident, that more intensive human resource development won't influence other resources' development as much as the appropriate integrating resources' development does.

6. If the decision to create territorial clusters has been taken directly, then its substance should be aimed at developing and providing corresponding integrative resources. Only this way creating a territorial cluster may be successful.

These conclusions on territorial economic systems functioning with cluster and business self-production features do not contradict the main known cluster theory theses.

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Strategic Effectiveness Evaluation as Integral Part of the Modern Enterprise Management

Elena G. Popkova[1], Sergei A. Abramov[2], Lilia V. Ermolina[3] & Evgenii V. Gandin[4]

[1] Volgograd State Technical University, Volgograd, The Russian Federation

[2] Volgograd Economic-Technical College, Volgograd, The Russian Federation

[3] Samara State Technical University, Samara, The Russian Federation

[4] Financial University under the Government of the Russian Federation, Moscow, The Russian Federation

Correspondence: Lilia V. Ermolina, Samara State Technical University, 244, Molodogvardeiskaya street, Samara, 443100, The Russian Federation. E-mail: ermolina@mail.ru

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Abstract

Strategic planning and management create the conditions under which key workers develop the mission, business philosophy, and strategic plan in the course of teamwork. This opens up the organization to new solutions, allows you to interact with the environment, revealing the potential of employees, and turns the organization into a team of professionals, driven by the disclosure of personal potentials. Optimal set of quality indicators and targets of the strategic plan provides its implementation in real-time, enhances the level of control and, consequently, increases the efficiency of the organization. Management is the process of updating the company as a constantly evolving and relatively open complex system, which consists in the selection and development of its productive management deviations in the work and activities of the staff. Successful strategic management requires an estimate of the effectiveness of strategic enterprises which are the subject of this article.

Keywords: economic activity, management, modern enterprise, socio-economic system, strategic effectiveness evaluation

1. Introduction

Modern economics still includes non-regulated intra- and inter-sectorial mechanisms for joint economic activity. There are significant lag qualification managers that control firm as an organization. Efficient functioning of the economy of the subject based on the strategic development of its system-resources in conjunction with heterogeneous external organizations on a systematic level remains undeveloped.

In this regard, the development of techniques and practices of development of management organization and its resource base in cooperation with business entities of the environment are essential for improving the theory of socio-economic systems and business. In the presence of such system, resource management firm becomes able to plan and successfully implement the investment process. Development of methods of strategic planning and performance management of the firm's resources, as well as managing their interaction, are intended to create an organization in which the realized economic relations diverse business entities. Subject of the research is Strategic effectiveness evaluation and its role in the modern enterprise management.

2. Materials and Methods

Measuring the effectiveness of strategic planning is based on a comparative analysis of economic activities of the organization with the objectives. Evaluating the impact of the strategy is seen as a feedback mechanism to adjust the strategy. Evaluation of the strategy can be of private or integral character:

• Assessment developed specific policy options to determine their suitability, feasibility, acceptability, and consistency to the organization;

• Comparison of the results with the implementation of the strategy objectives (Eppink, 2013).

It seems clear that the effectiveness of strategic planning can be seen in broad and narrow senses. In the narrow sense, the effectiveness of strategic planning (as a time-limited process) is the ratio of the result (developed by

the company's strategy in terms of its completeness, consistency, consistency, compliance situation, timeliness, etc.) to the resource costs associated with the development strategy.

In broad sense, the impact of strategic planning is understood as the effective implementation of the developed strategy. The second approach is more than justified, as "formal presence" strategy (strategic plan) does not mean the successful development of the organization, so the process of strategic planning makes sense only in the case of the practical implementation of the developed strategy. In this regard, this article is devoted to methodological and methodical approaches to the assessment of the effectiveness of the organization's strategy. Evaluation of the effectiveness of the strategy can be carried out on three levels (Table 1).

Table 1. The main directions of evaluation of the effectiveness of the organization's strategy

Level of evaluation of the effectiveness	Directions of evaluation
Effectiveness of the implementation of certain strategic projects	1. Cost of the project over its budget 2. Duration of the project compared to the plan 3. The size of the resulting effect of the project compared to the expected effect 4. The amount of additional (external, indirect) effects encountered in the implementation of the project
Degree of achievement of strategic objectives	Level of achievement of business performance (long-term and mid-term)
Degree of compliance of strategic objectives interests of stakeholders	The success of the strategy depends not only on achieving the goals of the company, but also on the degree of consideration of the interests of stakeholders: government, suppliers, lenders

The first three parameters assessing the effectiveness of individual strategic projects are traditionally included in all systems of business planning and investment planning (Table 2).

Table 2. The main parameters assessing the effectiveness characteristic

Criteria	Sphere of application	Weaknesses	Strengths
1. Return on Investment (BCR or PI)	Formation of rational set of projects with an investment during one year	Reflects the relative attractiveness of the project and makes it possible to rank the projects as to preference for including in the program	Ignores the scale of the project. No unit of time given. Obtained by the PI set of projects is not always optimal (the problem of diversification, interconnection projects, their liquidity and scale)
2. Net present value (NPV (NPV))	Evaluation of all the identity projects with a fixed start and completion dates. Assessment of organizational, financial and technical measures in the current activities of the company	Takes into account the scale of a particular project. Easy to calculate. Unambiguous interpretation.	Gives a correct estimate to continuously renewing projects only in conjunction with ECF. Inapplicable for evaluation of economic feasibility of the service life of assets (e.g., equipment) and for comparing the projects with different periods of life
3. The internal rate of return (IRR)	A comparison of the yield of processes which are underlying projects. The modified method (MIRR) is used for the same purposes	Provides compatibility with alternative investment. Does not depend on the discount rate, chosen by analyst. Provides a unified	One project can have multiple IRR, which makes it difficult to interpret the results of calculation. Incorrect in the accounting of reinvestment of revenues. Manual calculation

		evaluation of all projects, it is easy to develop reference values	often impossible or inaccurate. When comparing projects only by IRR, the risk is not accounted
4. Payback period (PB)	Sub-indicators for the rejection of projects with unnecessarily stretched time periods of receiving benefits. Evaluation of capital risk of the project	Gives an estimate of the project in terms of capital turnover. Allows rejecting projects with a lifetime, similar to the period of amortization of investments	Does not allow assessing the project after the payback period. Calculation is not unified (several modifications are known)
5. The equivalent annual income (annuity) - ECF	The basis for the choice of economically viable life of the asset (equipment). Sub-indicators in the analysis of individual projects to assess their "financial strength".	Easy to calculate. Unambiguous interpretation. Correct accounted for reinvestment of revenues	Does not take into account the scale of a single project, and gives a correct assessment only in conjunction with NPV. In the analysis of economically viable life of old equipment, it should be supplemented by NPV

The fourth option - the definition of "side (external)" effects - is necessary, but often overlooked, when analyzing the effectiveness of strategic programs step. However, the appropriate use of tools for assessment of projects' efficiency involves the consideration of all the most significant impacts of the project: in determining the effectiveness of the investment project, all the consequences of its implementation - direct economic and non-economic – should be taken into account.

The degree of achievement of strategic objectives is based on the conformity assessment of the planned targets of the strategic plan and of the reached level (Yue & Teng, 2014).

The simplest use of the target model assumes that there are few objectives, so they can be made achievable, and they are well formulated, so that they can be understood and measured.

As the characteristics of the target efficiency, a coefficient of adjustment (k) is used, which can be represented as follows:

$$k = (E / E0)\ 100\% \quad (1)$$

where E and E0 - actual (observed, reporting) and projected (desired, expected) effect (figure), respectively.

Unfortunately, the study of the target model revealed several problems of its application (Popkova et al., 2013):

• difficulty of the targeted approach consists in the fact that organizations have a multiplicity of objectives;

• purpose of the organization is quite specific (Saeed et al., 2012);

• used temporal perspective: a successful result for a short period may be unsuccessful for a long period;

• differences in the effects of the problem of events inside and outside the organization.

Thus, the problem of measuring the effectiveness of the strategy of the target depends on the accuracy of target formulating firms. Formulation of objectives must meet three basic criteria (Golam & Akhtar, 2011):

• objectives should directly follow the logic of business and selected strategic trajectories;

• objectives should be as specific as possible and be formulated in the form of quantitative indicators that can be monitored and of periodic inspection (Evans, 2012);

• quantitative indicators should be based on the ratio of the original situation (position) in the firm.

The sequence of formulating objectives should also follow the natural logic of strategic actions and their results:

1. Objectives related to the position of the firm's business in the market: the desired value for the money, the image of the goods (services) and its reputation with key customers, the desired level of customer loyalty, and so on.

2. Operational objectives that characterize the form and content of the business processes of the company and change the positioning of the business in the industry market: early impact on the client's needs, reducing the level of individual types of costs and so on (Pine et al., 2013).

3. The target level of sales provided by the selected value for money (Zhang & Tan, 2012).

4. Financial objectives: to determine the level of financial investments (investments) and financial returns (profit margins, etc.).

3. Results

Strategic level evaluation of the effectiveness of organizational change is related to the development of the marketing activities of strategic projects, increasing the cost of business, so it is not tied to specific sales (Harrigan, 2012). Marketing costs are referred to as attachments, or investments, and the main criterion for assessing is the situation of the company in the market due to organizational changes (Galbraith, 2013).

To evaluate the effectiveness of organizational changes at the strategic level, we propose to use the indicator of strategic effectiveness of organizational changes SEOC (strategic efficiency of organizational changes):

$$SEOC = P (t2, t) \text{ x } a \text{ x } f (O; I; L) \quad (2)$$

where P (t, t2, ..., t) - strategic capacity, a capacity factor, O - cumulative effect of the ambient (outside) environment, I - aggregate impact of internal (inside) of the medium, L indicator of leadership participation.

Strategic potential P (t, t2, t) is defined by a set of target characteristics (parameters) t, for ensuring which the organizational changes are conducted. A list of desired characteristics t. is formed according to specific strategic intents and is given in the form of individual goals of changes. The extent of reaching them influences the total result - strategic potential P (t, tt), i.e. this potential is a function of progress of target characteristics (Ofori & Hinson, 2013).

To ensure a high strategic potential, the values of the targeted characteristics as a result of changes t. should be close to the values that were set initially in the form of targeted t. In addition, the synergistic effect from the achievement of all targeted parameters should be maximized (Popkova & Tinyakova, 2013a):

Capacity factor (capitalized value) is used in the investment analysis to calculate the amount of money that the investor will receive after a certain number of years (Popkova & Tinyakova, 2013b). Coefficient of increase is calculated for a given rate of interest and the number of years, for which, during the assessment of investments, a special table with calculated values a is used. Formula of coefficient of increase is the following:

$$a = (1 + j)\, m \quad (3)$$

where j is a given interest rate as a decimal (for example, 10% = 0,1), m - time (a year) for which the effect is calculated.

The feasibility of increasing the coefficient in the evaluation of the effectiveness of organizational change is justified by two important moments. First, simplified organizational changes can be viewed as an investment project, where the financial point of view of the investor will be interested in the capitalization of investments. Secondly, in the strategic management, the potential is something that will have the form of specific financial results in the future. The potential is converted into tangible effect gradually, becoming the basis for the formation of a different potential (thus being projected into other subsequent effects) (Kogut, 2013). Thus, over the years, the strategic potential is "capitalized" and already finds another value. Actually, in this sense, strategic and organizational changes are different from simple investment projects of validity (use).

To understand what the strategic potential of P should be (t, t2, tj) for the provision of the given strategic effectiveness SEOC, discount coefficient ft should be used:

$$B = 1 / (1 + j)\, m \quad (4)$$

Cumulative environmental effects O affect the relevance of achieving the strategic potential, increasing or, on the contrary, decreasing it. The indicator can be calculated by the formula:

$$Q * \Sigma\, n\, i = 1Si * Fexti = 0; \Sigma\, n\, i = 1Si = 1 \quad (5)$$

where q is a function that reflects the interdependence of environmental factors (as a property of the environment), S - index of influence (share weight) of environmental factors on the process and results of organizational changes; it can be determined by expert assessments, Fext - value of environmental factor (external factor) on organizational changes and their results.

Cumulative impact of the internal environment of I is defined by the formula:

$$u * \Sigma n\, i = 1Si * Finti = 1; \Sigma n\, i = 1Si = 1 \quad (6)$$

where u is a function that reflects the interdependence of the factors of the internal environment, Si - influence index (share weight) of the internal environment factors on the process and results of organizational change; it is determined by expert assessments, Fint - value of the i-th factor of the internal environment (internal factor) for the organizational changes and their result.

The leader depends on the use of (return) strategic potential in the long term. Successful organizational change is impossible without a strong leader. Usually, he initiates the change. The key to success will be the quality manager, such as experience, knowledge, energy, ability to lead people and take responsibility, exact calculation, prudence, caution. Coefficient of leadership participation L is defined by a set of characteristics of the leader:

$$L = v\ (e, m, c, ps, ph) \quad (7)$$

where v is a function expressing the combination of individual characteristics in a leader, e, m, c, ps, ph – respectively, educational, spiritual and moral, creative or generative, emotional and psychological and physical characteristics of a leader.

4. Discussion

Thus, the rate of effectiveness of strategic organizational changes SEOC will always have a unique value, depending on the strategic potential of organizational changes, the specific effects of environmental factors, unique set of the factors of internal environment, the leader's personality changes - all adjusted for evaluating the effectiveness of a particular point in the future.

The proposed formula for calculating this indicator is specially designed for strategic management. The final result of evaluating the effectiveness of organizational change is a comprehensive assessment of various areas of marketing and other activities in terms of their operational and strategic effectiveness, adjusted for the company’s strategic position in the market.

5. Conclusion

In the context of the modernization of production and management, the organizational management structures are unable to change in response to changes in the environment. Management of the organization, which is a relatively closed system, is necessary during the moments of fixing its new stage of development. This approach is particularly significant for the control on the lower levels of the hierarchy of the organization. Ideal technical and technological basis of functioning of the organization ensures the possibility for entrepreneurial activity at the upper levels of its hierarchy.

This division management is carried out in the theoretical consciousness, while in practice they exist simultaneously. It is an emphasis on the use of a particular method, depending on the specifics of the corresponding stage of the life cycle of the organization. Therefore, evaluation of strategic effectiveness is an integral part of the modern enterprise management, as it provides the timely identification of the necessity and assessment of the perspectives of its activities.

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Conceptual Features of the Balanced Development of Business Organizations

Alexander I. Khorev[1], Yuri A. Salikov[1] & Nadezhda A. Serebryakova[1]

[1] Voronezh State University of Engineering Technologies, Voronezh, The Russian Federation

Correspondence: Alexander I. Khorev, Voronezh State University of Engineering Technologies, 19, Revolyucii Avenue, Voronezh, 394036, The Russian Federation. Tel: 7-473-255-4267.

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Abstract

In authors' opinion, studying and searching for main features of organizational development possess a fundamental nature and is a main task of scientific research in the sphere of economics and management. According to the results of the performed research, the main attributes of the organizational development include balance, which could ensure stable work of the organization. In general, balance characterizes harmony and equation of the system as to all its compomemts; a methodological basis of the balance, as an object of scientific research, is the dialectic nature of dichotomic aspects in the developing system. The article includes practical examples of dichotomic contradictions which require a balanced approach as to preferred spheres of activity of industrial organization. With the help of the presented examples and based on the opinions of famous specialists, the authors prove that account of requirements to balance of processes and elements of the organization as a socio-economic system, allows reflecting the real situation more adequately, comparing alternative variants and making high-quality managerial decisions, reasoning and forming priorities of business activity, minimizing risks and contradictions while forming and realizing strategic and tactical goals.

Keywords: organizational development, balanced development of business organizations, features of development, dichotomic peculiarities of development, balance

1. Introduction

At present, the influence of the category "development" is rather strong, both in theoretical and practical aspects. Having undergone evolution, the notion of "development" spread in scientific circles, sphere of public administration, numerous international organizations and political societies, and various social classes. By virtue of its special importance, volume and complexity, this category became a key one during last 50-60 years in scientific, political, social, and economic vocabulary. Usage of the notion of "development" is often a peculiar test and implicitly proves the competence and awareness of modern realia.

Classical scientific ideas, regarding essence and peculiarities of development, originally had a vivid philosophical nature and were elaborated mostly for the problems of macro-subjects, including society, state, policy, and economy as a whole. However, during last decades, scientists' attention to the issues of development at the level of business organizations grew, which resulted in emergence of new scientific field that received the name "Organization Development" (OD).

Scientific literature describes a wide variety of main features and peculiarities of OD. At that, during the primary stage of this concept's formation, the meaning of OD was rather narrow. Thus, according to some authors, including Bennis W. G. (1969), Miles R. E. (1975), Huse E. F. (1980), OD supposed a specific program, strategy, or series of steps for implementing corporate changes that related primarily to behavioral aspects and aimed at the increase of organization's functioning effectiveness. The next stage of conception's formation is characterized by a wider scientific view, according to which, the researches pay attention to the necessity of considering not only behavioral, but also other important factors of organization development.

For example, the list of main principles and values of development, presented by the International Association of Consultants (involving Portsmouth Consulting Group), states that OD is an effective method in democratic society, which includes openness; control of actions; dialogue between people who possess the same authority and tend to solutions and development of new courses (Kubr, 1986). At the same time, a lot of authors, in

particular, Beckhard R. A. (1989), Porras J. I. & Silvers R. C. (1991), emphasized the importance of organizational processes, and the researches Deal T. E. & Kennedy A. A. (1999), Schein E. N. (1999) and others assigned the main part to organizational culture. Necessity for achieving balance and accordance with such factors as strategy, structure, culture, and organizational process, was emphasized in the works of Adizes I. (1988), Drucker P. F. (2002), Peters T. J. & Waterman R. H. (2004) and others.

Thus, the received results show a detailed picture of the process of organizational development. However, the complexity of the research object and absence of unity of opinions among the authoritative specialists determine the necessity for perfection of conception of OD, based on the search and reasoning of main peculiarities of development of business organizations in dynamically evolving external environment.

2. Materials and Methods

The main tasks of the conducted research of the condition of modern theoretical and applied works in the sphere of development of business organizations are the following:

a) Conducting retrospective analysis of scientific conceptions which contributed largely into formation of modern ideas about development of organization and management of this process,
b) Revealing factors that ensure and prevent the processes of stable development of business organizations;
c) Studying conceptual peculiarities of development of business-organizations;
d) Reasoning and describing new features and peculiarities of development with the help of corresponding methodological framework;
e) Forming recommendations as to further research in specific scientific sphere.

In this research, the authors used the hypothesis that the necessary methodological basis was not created in modern management up to this time. That's why, in further scientific work, it is advisable to use the methodological framework which possesses objective and dialectic nature and formed in other scientific fields. According to the authors, these fields include philosophy and engineer sciences, which feature important scientific and methodological ideas, related to sustainable development of technical and informational systems. At that, the dialectical basis, which allows viewing the researched issues in their constant interconnection, movement, and development, may be a methodological and systematic platform for scientific research in the sphere of organizational development, and, in particular, during search for peculiarities of the modern process of business organization development management.

For performing the tasks during research, a complex scientific instrumentarium was used; it included dialectic laws, epistemological methods, and the methods of scientific abstraction. The scientific results were received using the following methods: expert evaluations, questionnaire, analytical, abstractive and logical, generalization and synthesis, prioritization, comparison, and observation. Theoretical and methodological basis of the research was the works of foreign and Russian scientists on the sphere of stable and sustainable development of business organizations, publications in scientific literature and periodicals, materials of scientific conferences, and internet data.

While describing a modern methodological and systemic basis of research in the development of business organizations, it should be noted that the main part of the conceptual ideas is formulated based on empirical basis and practical experience and requires the further scientific reasoning. These ideas correspond to the fundamental principles of systemic, situational, process, functional and other scientific approaches, used in modern spheres of management. The stated scientific approaches recommended themselves as a top-priority methodological instrumentarium. They allowed increasing scientific experience and knowledge both in the sphere of organizational changes management and in the sphere of organizational development as a whole. However, the analysis of peculiarities and value of these approaches showed that their methodological potential mostly depleted itself and is now rather limited (Salikov, 2008). Still, beyond doubt, the use of methodological tools, developed by generations of previous researches for systemic approach, is still actual.

Thus, for methodological and systemic provision of further perspective scientific research in the sphere of management in modern conditions, it is advised, together with perfecting the instrumental basis of scientific approaches, to pay attention to dialectical and systemic principles of the processes which take place within the business-organization.

3. Results

Results of analysis of various scientific approaches, ideas, and conceptions clearly show that at present, there is no unified and logical theory of development of business organizations – despite the variety of attempts made.

Moreover, the specialists in this sphere of scientific research do not agree on the nature and peculiarities of the process of development.

As to practical activities of modern business organization, the process of OD is described as a strategy of organization, based not only on the ideas related to organizational culture and group dynamics, but on the conceptual ideas related to planning and implementing organizational changes (Goncharuk, 2000). Summarizing the content of various research in this sphere, it is possible to state that changes are an important feature and inevitable necessity of organizational development.

In modern managerial literature, a saying by Heraclitus is very popular; it is 2500 years old, but still actual, as in old times: "Change is the only constant". This quotation is to be found in various interpretations in the works of leading specialists in the sphere of business organizations development: P. Drucker, T. Peters, K. Blanchard and others. Thus, changes are the sense of development of an organization and a specific process of emergence and manifestation of new features, properties, and elements in the organization as in a socio-economic system. Successful implementation of changes increases the potential for organization development and ensures the increase of its competitiveness in the market. At that, the process of development includes the elements of variety of changes which are related to renewal of the organization as a system, of its structural and functional content.

Retrospective analysis of scientific works in this sphere shows that, whichever angle the notion of "development" is viewed at, one way or another, it focuses on the issue of changes. Most often, from the modern positions, development is described as an irreversible change of material and ideal objects, based on existing laws and regularities. This definition clearly discerns 3 main attributes, the obligatory and constant manifestation of which is an exclusive characteristic of the process of development and distinguishes it from many other evolutional and revolutionary changes. As a matter of fact, reversibility of changes is peculiar only to processes of functioning, aimed at constant and periodic reproduction of the system of functions; absence of regularity is peculiar for accidental facts of catastrophe type; when the direction of changes is altered, the process of development loses the distinctive unity, internal orderliness, interconnection, interconnectedness, and consistency, which results in the system's complete change (Kokhanovskiy et al., 2003).

The stated three attributes of the process of development, as an object of scientific research, are dominant and do not cause any doubts among specialists. At that, we believe that these features, despite their fundamental importance, cannot be comprehensive for such complex object of knowledge as development. Accordingly, the search for new supplementary features and peculiarities of the process of development, their identification and reasoning, should be included into an important scientific task, which has a substantial theoretical and practical significance.

Obviously, a permanent nature and stability of changes, their endless row and spontaneity cannot fully facilitate the successful functioning of business organization as a system, but can become a critical destructive factor for it. Consequently, a sustainable developing system requires maintaining the stability of its functioning – however, such stability should not slow down or immobilize the very process of development. If a system becomes fully stable, it shall bring it to dogma, stagnation, and, finally, to end of existence. Therefore, a specific dialectical contradiction arises: development of a system should be stable and unstable at the same time. Solution to this contradiction may point to new important supplementary features of the process of development.

System's theory supposes that, while in the stable condition, the system self-preserves itself – if the changes within it do not have an active self-destructive nature. However, there are systems with various levels of stability; thus, a high level of stability causes a strong resistance to the changes (both inside and outside the system), and also a minimum ability to adapt to changing external and internal conditions. In relation to business organizations as socio-economic systems, the problem of ensuring stability in the process of activities is very important and is related to solving both tactical and strategic tasks. Theory and practice of organizational development, based on the studying and performing changes, determine the process of development as unequal, unstable, and inconsistent, and at the same time as determined and goal-oriented. Consequently, development of socio-economic systems as a whole should be viewed as a specific result of logical dialectical cooperation of a variety of conditions, factors, or objects, which are contradictory in nature, direction, and essence.

In this regard, it is advisable, while viewing the peculiarities of development, to take into account the role and meaning of such important philosophical category as dichotomy. The notion of "dichotomy" (Greek dicha + tome, which means dividing in half) is closely related to the notion of "system". This sententia is widely known in various spheres of scientific knowledge, including informatics, biology, astronomy, politology, etc., in which it means dialectic (systemic) unity of two contradictions which constitute a single whole.

Beginning from the middle of the 20th century, when the influence of psychological knowledge on management grew, this notion started to be used in managerial literature – in particular, in relation to McGregor's theories of "X" and "Y" which were popular at the time. After that, the dichotomic point of view became actual in scientific argument as to possibilities and importance of two alternative processes of centralization and decentralization in the system of business organization management. At present, this notion is not widely spread in management and almost not used as to the essence, methods, and mechanisms of management. The reason for this is limitation or absence of dialectic understanding of complex events and phenomena, peculiar for economic and managerial processes as a unity of the two most important, but opposite in direction, elements of the system.

However, the manifestation of dichotomy is common for business management. The better decisions are made by the managers as to contradictory problems of dichotomic nature, the more successful is the organization and its departments. Effectiveness and efficiency of these decisions are determined by the scale and depth of using systemic, intrasystemic, and "over-systemic" transitions.

Figure 1 shows the schemes of dychotomic contradictions which often emerge in the market activity of industrial enterprise. These contradictions are determined, based on the results of questionnaire of managers of middle and high level of variety of Voronezh industrial enterprises which produce food. Questionnaire showed that the issues of balance are actual not only inside the functional spheres of activity of studied enterprises, but also between the functional spheres. Thus, by virtue of imbalance of organizational processes, the efforts, made by the managers for solution of the financial management problems, are half as much as the efforts for solution of industrial problems, and the problems of personnel management require 3 times more efforts than problems of industrial nature.

Table 1. Examples of dichotomy contradictions in the spheres of activity of industrial enterprise

Corporate sphere		
Satisfaction with achieved state of things	⇔	High risks of making and implementing strategic decisions
Decentralization of management	⇔	Saving resources, effectiveness, and speed of decisions
Diversification of industrial activity	⇔	Mission creep, increase of expenses, complication of management system
Suspension of production is necessary for modernization	⇔	Suspension of production leads to direct economic losses
Creation of integrative structures (clusters, holdings, etc.)	⇔	Increase of loss of property risk (completely or partially)
Necessity for active organizational changes	⇔	Active resistance to changes from personnel
Sales and marketing sphere		
Realization of production	⇔	Level of debit debt
Communicational and advertising policy	⇔	Informational security and protection from rivals
Rise / fall of price	⇔	Fall / rise of sale
Active influence on the consumer	⇔	Strong responsive actions by rivals
Saving costs during work with suppliers and buyers	⇔	Instability of economic relations and rise of risks
Industrial sphere		
Reduction of production cost	⇔	Improvement of the quality of production and customer satisfaction
Reduction of production cost	⇔	Expenses for observing high environmental requirements
Reduction of production cost	⇔	Expenses for innovational activity
Possibilities for technological process	⇔	Requirements of external environment
Financial sphere		
Need for investments and capitalization	⇔	Current interests of stockholders
Need for financial resources	⇔	Difficult conditions and possibilities for their engagement

Rentability of organization	⇔	Critical volume (decrease) of production
Great need for finances (investments)	⇔	Low paying capacity
Insufficient means of budget	⇔	Necessity for strengthening security
Increase of profit	⇔	Expenses for social programs and charity
Personnel management sphere		
Turnover of staff and casual employment of personnel	⇔	Economic and informational security
Need for qualified personnel	⇔	Possibilities for salary
Personnel pay-off	⇔	Increased expenses for motivation
Goals of organization	⇔	Goals of employees
Labor conditions	⇔	Efficiency of personnel work
Rise of loyalty	⇔	Implementation of personnel professional and social development programs

Thus, returning to the issues of stable development of socio-economic systems, it should be noted – taking into account the objective dichotomic peculiarities of the system – that there is a necessity for viewing in dialectical unity the complex of two contradictory requirements to the studied process. Any business organization exists in a certain market environment which can be conventionally divided into external and internal ones. Internal environment supposes the maximum sustainability of all processes up to rigid state - and external environment, being a main source for dynamic and deep changes, brings the possibility for ensuring stability to the minimum.

Striving to get the expected results of realization of tactical and strategic plans, the management of business organization should search for ways of the most rational solutions of emerging contradictions, based on systemic principles and with the help of balanced approach. It is known that when there is an attempt to substantially improve any parameter or element of the system, another element or parameter appears which worsens inevitably. Consequently, a balanced approach to the development of organizational processes should ensure the simultaneous maximal improvements of system's condition by means of changing certain parameters and elements, and minimal or even missing aggravations, caused by the forced concurrent change of other parameters or elements of the developing system.

Based on the above, it is possible to conclude that balance should be viewed not only as a requirement to current functioning of modern organization, but, mainly, as a very important feature of the process of its long-term sustainable development. The main essence of this feature is direction at the search of ways and possibilities for balance of contradictory phenomena, situations, and parameters which inevitable appear in the processes of development of business organization and management of the development.

4. Discussion

In general, balance means harmony and equation of a system as to all its components. This sententia derives from the word "balance" (French "balance" – scales), which, in its turn, has Latin origin (Latin "bilanx" – having two scales). In modern understanding, expression "balance" reflects the method of studying one or another economic phenomenon by comparing or opposing the parameters that characterize different sides of these phenomena (Lopatnikov, 2003). This understanding almost completely corresponds to the above ideas regarding systemic dichotomic manifestations.

Also, according to popular opinion, "balance" can mean a certain group (system) of parameters which together characterize parity in a changing process or phenomenon. This notion is the basis for a popular conception of balanced system of parameters of BSC (Balanced Scorecard), which offers the mechanism for ensuring the balance of strategic relationships with the current tasks of the company (Kaplan @ Norton, 1996), (Niven, 2008). A successful spreading of this conception was actually a beginning and reason for forming real scientific field in economics and management, related to study of the issues of ensuring balanced development of business organizations.

Important scientific preconditions for forming conception of balanced development include, together with works of Robert S. Kaplan and David P. Norton, also "Mission Possible: Becoming A World Class Organization While There's Still Time" (Blanchard @ Waghorn with Ballard, 1997). In this book the authors note that if there is an alternative of attempts to improve the existing state of affairs or creation of a new situation, it's necessary to do

both. At that, it's important to keep stable balance between stability and innovations – as both are equally significant and cannot exist separately. The similar approach is supported by Stephen R. Covey in his bestseller "The 7 habits of highly effective people" (Covey, 2004) – with the help of appropriate examples, he reasons the necessity for supporting stable balance between the process of routine functioning of business organization and the process of its perspective development.

Among scientific researches, recently conducted by Russian scientists in the field of balanced development, a clear tendency for transition from systemic to sub-systemic level of organization as an object of scientific research should be emphasized. Unlike traditional direction, related to the study of corporate issues (e.g., balance of internal and external environment, balance of economic and social policy, etc.), a new tendency is directed at the study of in-house aspects. These aspects include issues of balanced management of organization development, issues of balance of industrial and marketing activity, balance of export and import, and balance of innovational and investment activity (Soblirov, 2009; Morkovina et al., 2014; Serebryakova et al., 2014). At that, it is emphasized that the balanced nature of innovational and investment activity of business organizations requires the search for effective mechanisms, aimed at the forming necessary investment resources for well-aimed innovational policy.

5. Conclusion

The notion of "development" has undergone a long evolution and become widely spread. At present, it is viewed as a targeted and irreversible change of objects, based on the existing laws and regularities. The result of development is a new qualitative condition of the object of changes which suppose the presence of scientifically reasoned management that is able to create adequate goals for development and ensure their realization. Specifics of functioning and high economic value of business organizations preconditioned the necessity for methodological, systematic, and practical elaborations in the sphere of organizational development.

By combining the experience of scientific research in the field of OD, it is established that at present time, the absence of agreement of opinion among specialists as to the direction and sense of development is a restraining element in the study of other important aspects, including the details of this process. According to the authors, the most important conceptual peculiarities of the development include its balance. A methodological basis for this feature is dialectic nature of dichotomic manifestations in the developing system.

Account of requirements to the balance of the processes and elements of business organization as a socio-economic system allows reflecting a real situation more adequately, comparing alternative variants and making successful managerial decisions, reasoning and forming priorities of business activity, minimizing risks and contrariety while forming and realizing the strategic and tactical goals.

The received results show that the further scientific study in this field should be related to the search for other important peculiarities of the complex process of business organization development, perfection of models of L. Graner. K. Blanchard, T. Vaghorn, I. Adizes and others, formation of appropriate mechanisms for management of balanced development, and to active use of mathematical instrumentarium for describing specific peculiarities of the process of development. Moreover, in our opinion, the further research in the field of management of balanced development of business organization should have a balanced nature, as well: this research should be equally aimed at the conceptual corporate aspects which form theoretical and methodological basis, and at the revealing the specific dichotomic alternatives with the following goal of their rational applied use.

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Philosophical and Methodological Potential of Categories "Social Time" and "Social Space"

Elvira R. Gatiatullina[1], Elena I. Polyakova[2] & Alina N. Khasanova[2]

[1] Moscow Witte University, Moscow, The Russian Federation

[2] National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moscow, The Russian Federation

Correspondence: Elena I. Polyakova, National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Foreign Languages Dept., Kashirskoe shosse, 31, Moscow, 115409, The Russian Federation. Tel: 7-495-340-2314. E-mail: poliakgreen@yandex.ru

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Abstract

The article is dedicated to one of the most relevant issues of contemporary philosophy: methodology for analysis of social space and social time. It considers the cognitive foundations of perception of space, some aspects of the design process of spatial models and their reflection in a natural language. Understanding of space is impossible without linguistic constructions, as many peculiarities of environment including spatial and ontological facts can be formed and fixed in human consciousness through linguistic concepts.

Two dominant structures of social objective reality - i.e. social time and space - have been discussed: processes of genesis of informational society and world globalization. It is revealed that usage of category of "identity" gives principally new opportunities to reflect specificity of social space and time under globalization. The article considers social networks as a principally new form of social space in information society: they are deprived of constant localization and calendar determinants, abide by their internal laws and are not vulnerable to unification processes.

It is also shown that in the general context of world globalization the character of mutual determination of social time and space is changing. Not so long ago the main tendency of social time and space was seen in accelerating its "going". Nowadays, under contemporary hyperdynamic globalization of social objective reality the objective measure of social time is power of substance streams in social space, energy, and information, and this power is mediated by new forms of social objective reality, including global market, international corporations, electronic stock exchange and money, Internet etc.

Keywords: identity, information society, modernity, network society, social space, social time, world globalization

1. Introduction

Internal laws of philosophical cognition are such that its intentions are determined by the general context of social reality in the most general understanding. The latter includes level of culture, social processes which are dominant at the current moment, forms of activity and communication that have been formed (or being formed). In this sense the categories of time and space (the main measures of objective reality) are unchangeably topical matters of cognition. In its turn, the meaning and forms of operationality of these categories are inevitably determined by the level of philosophical cognition that has been reached. It engenders a certain "vicious methodological circle", the breach of which means a new stage in cognition development. This article deals with certain cognitive basics of space perception and certain peculiarities of reflecting spatial perception in natural language.

Processes going on in our consciousness at the moment of constructing spatial models are little researched. There are not enough researches that could be characterized by interdisciplinary character and lie on the verge of gnoseology and particular branches of linguistics. However, the question of spatial modeling is referred to in different sciences: Physics, Mathematics, Philosophy, Linguistics, Psychology, and Neurophysiology. Understanding of space is impossible without linguistic constructions. The language itself is not just the instrument with help of which man communicates, but the most important medium in which multifaceted

practical experience is rolling out (Polyakova, 2015). Natural language allows us to fix and describe complex structural components of environment, phenomena of events, and configurations of different circumstances. It also allows us to fix it all in structures of sense. In this meaning, these processes appear to be tightly connected with morphological structures of language that fix the main spatial characteristics (Polyakova, 2014). As to perceptive and gnoseological components of cognition, it is possible to say that perception of reality is based on transformation of data and their being transmitted by human consciousness with help of language. Linguistic concepts allow us to form and fix in human consciousness many peculiarities of environment, including spatial and ontological facts.

2. Method

In the epoch of ancient, contemplative Philosophy time and space were understood naturalistically: space is extent, time is duration. It eventually deprived these categories of cognitive sense and operationality. Mysticism that became the dominant of Philosophy in Middle Ages sees time and space differently – as God's creation (a part of his creations). In this context time and space get dual dimension: terrestrial (temporary, imperfect) and celestial (eternal, perfect). Only with Galilei and Newton's natural conceptions time and space became operational elements of natural scientific ontology and of cognitive processes, which later deepens and develops in Einstein's conception.

Nowadays interpretation of time and space as an ontological measure of natural world is determined by physical cosmology and synergic ideas. It should be mentioned that up to the modern era there were practically no distinguishing mechanisms of causality in the world of social and natural processes, which is principally important for the purposes of this article (Gatiatullina, 2011).

In ancient philosophy there is a model of "macrocosm" and "microcosm", which spreads natural laws on society. In Middle Ages, God was the absolute cause, i.e. a universal form of causality, equally actual in natural and social world. In this sense the question of social space and time in Philosophy emerges comparatively late, in the context of Vico's ideas. It is Vico who became the first to insist that forms and mechanisms of determination of social processes principally differ from such in natural world, thus bringing up the question of social time and space, because only basing on them it is possible to understand specificity of social objective reality, its causal mechanisms and forms of their manifestation.

Later G. Simmel directly raises the question of social time and space, which gets rather unlike development in Rickert, Marx, and Parsons' theories. It should be mentioned that while Simmel's social time and space appear to be "pure forms" (in the spirit of Kant's a priori), basing on which the comprehension and description of reality are possible, Rickert speaks about space and dynamic of culture and cultural senses. According to Marx, as we know, social time and space are forms of class structure, the system of relations of manufacturing forces, relations and their dynamic, which acquire definite typological forms in socio-economical formations and in their type spectrum. As to Parsons, he interprets social space and time as a system of stratifications and a measure of their dynamics and transformations as if highlighting interdependence of social space and time (Zijderveld, 2006).

A. Bergson imparts an absolutely new sense to categories of "social time" and "social space" in the context of ideas of life Philosophy. The situation appears that social time and space turn out to be functions of life and consciousness. In his turn, Bourdieu defines social space as a certain field of tensions, created by so-called habitus, which is a normative system of social actions that are determined by culture and transmitting social experience from foregoing to upcoming generations (Bergson, 2003).

The stated conceptions, although seeming to differ, fit into the paradigm logic of classical science and Philosophy. They interpret social time and space as certain ontological constants of society, its structure and essential mechanisms of objective reality and linear progressive development (Tkhagapsoev, 2011).

Socio-historical dynamic of civilization (context) and cognitive culture of the second half of the 20th century engendered principally new views on social time and space.

As we know, modern civilization's state is estimated as nothing else as "threshold". It is on the verge of changing all forms of human activity, from economical, technological, social, and structural to existential. Consequently, scales, temps (dynamics), and plurality of changes nowadays act as the main measures of objective reality. They envisage all basic spheres of life: culture, technology, cognitive practice, socio-political organization, communication. It should be mentioned that the dynamics of changes is such that the possibility to express the essence, spirit, image, structure, and temporality of the upcoming is problematic. A whole range of definitions claims for it: post-industrial, informational or creative (as it is more and more often called these days)

society, "post-economy epoch", "society of knowledge" and even "post-human epoch". Obviously this unusually dynamic process of shifts and changes in objective reality of man, society, and culture, which we are witnessing, is going to be deflected through categories of "social space" and "social time".

In this matter a special attention should be paid to Castells and Beck's approaches (Beck, 1999). Castells thinks that when we speak about modern society, which he defines as informational, social time and space can be no longer considered just a form of society's existence and a measure of its objective reality, because nowadays social time and space are society itself. Moreover, he thinks that all the various transformations that have taken hold of the world in this way or another are summed up in transformation of social time and space. Also Castells' main form of social space is not a geometrical metric and social structure, but streams and their structure: goods, money, raw material, labor, information. These views find support in Beck's conceptions that are dedicated to globalization processes (Castells & Elgar, 2004).

It should be mentioned that in Castells' theory social networks occupy a special place. The matter is that the essence and character of modern transformations of social time and space in the general context of our civilization's current radical changes were expressed namely in social networks, forms, and ways of their being. Here (in social networks) space loses its physical and geometrical dimensions, while time becomes the absolute measure of space. Perhaps the most important is that social networks become a mechanism and space of producing senses and of their exchanging, which means the principle sociality (Freeman, 2004). The possibility of constructing dimensional models is based on empiric approach. Language, in its turn, gives wide opportunities to describe various structures of space, time, objects, and phenomena. Modules of visual perception divide inside the brain all the coming information into objects and places. It is on these data which objective perception of reality is based. It reflects in semiotic structure of language.

Perception of a material object is projected in semiotic structure of language as a synthesis of visually fixed information. Space is a part of objective reality. This part is material and actual, as it has countable physical parameters. It is impossible to imagine any material object without definite characteristics that would prove its existence in space. Constructed space models are reflected in natural language, they express individual's cognitive abilities and have empiric basis. In the center of this basis lies the perception of an individual as subject of cognitive relations in the system of his interaction with environment.

Although, the final result of all changes of objective reality, about which we speak, is a growing variety of social objective reality, forms, and types of its manifestation. It touches upon the principal measures of objective reality: social time and space (Levine, 1971). Now they express not just a certain range of social structures and relations or a set of, in fact, standard time measures of temporality, but a fluid and multifaceted stream of information, senses, resources that immediately require identification.

3. Results

So there arises a question of identity of social space and time - to be precise, of variety of their forms and contents. Let's make it clear on the example of social identity. The peculiarities of social objective reality (epoch, historical moment) to some extent deflect in identity of social factors. It happens because human identity is a certain variant of individual's aggregation and constellation of the senses of objective reality, forms of culture and sociality, motivations for actions, axiological positions and behavioral schemes in environmental conditions of communication, interaction and activity "here and now", to be precise, in a certain historical epoch (Erikson).

As personal forms of culture and cultural objective reality became possible (sanctioned by society) only with appearance of early forms of European capitalism, at earlier stages of history a man had to stay within socio-cultural identity given to him by birth, taking into account his class position, religion, and ethnicity. Such identity, which can be defined as "sacred-temporal" leaves no place for personal distinction and thus can be called personal only conventionally. However, over the years (as capitalism and differentiation of society and forms of social objective reality developed) a new type of personal human identity is constructed. It is of "corporate-transformative" type, which marks appearance of social lifts, variants of cultural choice, and self-determination. From the beginning of the 20th century, the modern modus of personal identity is formed in the general context of dynamic of social objective reality and development of means and forms of communication. It can be defined as "communicative-spectral", because it expresses unprecedented modern human mobility (mental, axiological, professional, cultural, dimensional and behavioral) and decisive role of information streams in human life. In this situation, personal identity inevitably acquires not just plural, but aberrant, shimmering, highly unsustainable character, which is suggested by current factors (minor social group, fashion, mass media, political and cultural technologies). In this context forms of social human objective reality as well as their spatial and time dimensions inevitably acquire multiple and unsustainable character. It requires

implementing specifying measure "identity" in methodology of social time and space (Tkhagapsoev & Gatiatullina, 2012).

Moreover, with growing role of social networks (which is characteristic nowadays), network organization starts to prevail over external, coercive government of society. So, forms and types of social identity, as well as senses, ideas, and projects, promoted by creative personalities by means of social networks, become the landmark of people's self-organization, vectors of their activity and actions (i.e., what stimulates social time and space). It is observed everywhere: ideas, produced by creative people (or groups), social and cultural types, as well as promoted standards of habitualization and legitimization of horizons of social development determine practically everything that happens in society (politics, economy, culture), which means determination of spatial and time structure of society (Tajfel, 1982). All this, as was highlighted before, requires introduction of the category of "identity", its sense and methodological potential in the process of analysis of contemporary problems of social time and space.

4. Discussion

Hitherto two dominant structures of social objective reality (i.e. social time and space) have been discussed: processes of genesis of informational society and world globalization. However, there is one more factor that determines considerable influence on contemporary social processes and on the structure of global social objective reality. This is ethnic factor (Bentley, 1987). Considering all the above-mentioned, the methodology of analysis of social time and space under globalization and informational society is based, as we see, on the following ideas and principles.

1) Nowadays, with total globalization and incessant transformation of all aspects of social objective reality, the traditional methodology of analysis of social time and space that is based on structural ontological categories (civilization type, regime, socio-economical formations) and categories of socio-institutional relations (social class structure, ruling class, institutions of law, power and government) loses its effect and requires new approaches.

2) Frequently made attempts to base analysis of social space and time on the category of "modernity" does not solve the problem, as with globalization processes social objective reality loses specifying spatial structure. In other words, type of modernity acquires spontaneously changeable ("stream-like fluid") character (Khasanova, 2014). It also draws practically all "modern" measures of society and social processes which are forms of economical relations (market, private property) and consuming (mass consuming, consumerism), mechanisms of socio-cultural communication and means of interaction (electronic mass media, Internet, social networks) onto practically any locus of world space: region, state, ethno-social space.

3) Using the category of "identity" gives principally new opportunities to reflect specificity of social space and time under globalization and informational society because a broad marker structure of identity allows us to reflect differentially peculiarities of social time and space "here and now".

4) Virtual medium of social space (the Internet and other electronic media) the role and importance of which are consistently growing nowadays, for all aspects and forms of social objective reality (economy, politics, culture, education, communication) are deprived of sustainable substantial-structural forms (Leshchyov, 2014). Thus, it can be described and reflected only when based on methodological potential of the category of "identity", particularly on the basis of type and forms of identity of subjects acting in virtual space (blogger, poster, moderator, medium, provider, etc.) or identity of form of virtual technologies, practiced by them (chat, forum, flash-mob, social networks, etc.).

5) Social networks are a principally new form of social space. They are deprived of constant localization and calendar determinants. They abide by their internal laws and are not vulnerable to unification processes (tendencies of globalizing social objective reality). Thus, they act as a locus of constructing, spreading, and maintaining new forms (variety of forms) of personal and cultural human identity, which means forms of sociality and social relations.

6) In the general context of world globalization, the character of mutual determination of social time and space is changing. Not so long ago the main tendency of social time and space was seen in accelerating its "going" (which means the growth of dynamics of temps and rhythms of social existence and social forms). Nowadays, under contemporary hyperdynamic globalization of social objective reality the objective measure of social time (instead of calendar) is the power of substance streams in social space (goods, services), energy, and information. This power is mediated by new forms of social objective reality (including global market, international corporations, electronic stock exchange and money, the Internet, etc.).

7) The most considerable and active hindrance to total unification and homogenization of social time and space in globalizing processes is ethnic factor. However, under globalization influence the ethnos is gradually losing substantial forms of identity (geographic localization, economical arrangement, linguo-cultural sovereignty etc.). Instead, it acquires new forms of aspectual and symbolic objective reality in global social space, particularly in forms of brands and symbols of ethnic music, choreography, ethnic tourism and design, ethnic spiritual practices, etc.

5. Conclusions

In ethnic areas, under contemporary globalization the considerable (marking) level of specificity of social time and space is preserved. Meanwhile, this mentioned specificity transpires more and more often not in firm traditional forms and types of ethno-social connection, their organization and ways of functioning (institution of the older, power, and influence of clan, ethnic community and its regulative norms). It transpires in appearance of new spontaneously changeable (adaptive) forms of ethno-social objective reality (ethnic brands and ways of their market exploiting), in active restructuring of archetypes and symbols of ethnos (ethnic culture) in contemporary art forms (theatre, painting, music, belle-letters, design) as well as in various forms of re-actualization and politicization of ethnos' historical past.

To recapitulate, natural language is the unique instrument and medium at the time, within which reality "is caught" and fixed in categories, while spatial concepts are most important.

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Evaluating Financial Sustainability of Higher Education Institutions

Sergei P. Sazonov[1], Ekaterina E. Kharlamova[1], Irina A. Chekhovskaya[1] & Elena A. Polyanskaya[1]

[1] Volgograd State Technical University, Volgograd, The Russian Federation

Correspondence: Ekaterina E. Kharlamova, Volgograd State Technical University, 28, Lenina Avenue, Volgograd, 400005, The Russian Federation. Tel: 78-44-224-8476. E-mail: sikaterina@mail.ru

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Abstract

Economic reforms and reforms in the educational sphere have contributed to the increase of the concern towards the efficiency of the activity of educational organizations and higher educational establishments, in particular. This deals with the increased competition in both international and national markets for educational services; the growth of informational openness of higher education establishments and the enhanced role of strategic planning. All these aspects are gradually leading to a new objective that faces higher education establishments, which is a necessity to demonstrate the efficiency of their education services and support it with definite indices. Under conditions of budgetary expenditures, the problem of financial sustainability and efficiency of higher education institutions is becoming urgent, being focused on searching for possibilities to develop education establishments. In this context, the most important issue deals with developing approaches for quantifying financial sustainability and identifying the directions and means of its rise. The article suggests the method for defining the financial sustainability of higher education institutions and discusses both the indices, applied for financial sustainability evaluation, and their threshold values.

Keywords: financial stability, efficiency, education establishment, solvency, funds, budgetary funding, extra-budgetary funds

1. Introduction

Financial sustainability will be one of the key challenges for universities in the next decade: only those institutions that have sound financial structures and stable income flows will be able to fulfil their multiple missions and respond to the current challenges in an increasingly complex and global environment. Indeed, financial sustainability is not an end in itself; it aims to ensure that university's goals are reached by guaranteeing that the institution produces sufficient income to enable it to invest in its future academic and research activities. Income diversification is a tool to achieve these goals if the conditions in which the universities operate allow and require it, taking account of the diverse contexts.

The massification of higher education, additional and tougher accountability requirements, new societal demands on institutions, and rising costs of human resources (pension costs, etc.) are only some of the triggers for increased costs that universities are confronted with.

Financial sustainability is one of the most important characteristics for evaluation of the financial situation of an establishment. Providing inventory and expenditures by the sources of their forming is the essence of financial sustainability, and solvency is its external manifestation. The ratio between inventories and sources of proprietary and borrowed funds for their forming defines a degree of financial sustainability (Stabislavchik, 2010).

The problem of financial sustainability of education establishments has recently become of a scientific interest, since Russia's economy was switched to the market principles of functioning; i.e., in the late 1980s (Belyakov, 2012). At that time, the problem was just considered as theoretically possible for the system of professional training as a result of changes in economic conditions, and no thorough analysis was done. Both the dramatic changes in economic relationships in education in the early 1990s and the cut of budgetary funding exacerbated the problem of economic sustainability. As a result, the developed suggestions were useful singularly without forming any algorithm for a goal-oriented activity.

2. Background and Methods

The financial theory considers the concept of financial sustainability as the provision of financial independence, i.e. as the provision of maintaining both the break-even point of the share of equity in the total capital and solvency to an education institution (its ability to cover its current liabilities). The coefficients of institutions' financial sustainability are evaluated in accordance with their balance sheets (Kharlamova & Sazonov, 2014).

Rymanov A. Y. associates financial sustainability with a company's solvency, representing it as a system of financial and economic relationships which create, allocate, and use funds, providing solvency in a long-term aspect (Rymanova, 2010).

Benderskaya O. B. and Chizhova E. N. suggest that financial sustainability provides a company with innovation-based reproduction on an expanded scale, creditability, competitive ability, and investment attractiveness (Benderskaya, 2012).

"The financial sustainability of Higher Education Institutions in England, which includes its duties to monitor the financial health and risk of institutions" (Department for Business, 2014)

Lucie Lapovsky: "To ensure financial sustainability, many colleges and universities are responding by experimenting with changes to their business models. For instance, some schools are changing their discounting policies and publishing much lower tuition prices; others are experimenting with four-year price guarantees, the length of time required to earn a degree, more vigorous recruitment of foreign students, partnerships with overseas institutions, and increased operational efficiencies—from streamlining back office functions to offering online learning to reach more students without incurring the added costs of facilities and faculty" (Lapovsky, 2014).

At the same time, there are few studies concerning the problem of the financial sustainability of an education institution both in Russia and worldwide.

The objective of the research is to develop the theory and methodology of managing the financial sustainability of an education institution as a comprehensive system of theoretical provisions, which integrates methodological basics and concept models for forming the informational and analytical system of evaluating, monitoring, and managing the financial sustainability of education institutions in order to define the strategic directions of their further development.

3. Results

In the present time, when under conditions of both globalization and growing competition on the education market, Russia's higher educational establishments have to comply with new severe requirements for both educational services and research work, it is undoubtedly necessary to renovate and upgrade the systems of higher education establishment management, aimed at improving the indices of efficiency of their activity.

Efficiency is a key indicator of performance quality for the system, which characterizes a degree of its ability to fulfill its function as intended. As far as the efficiency of education services of higher educational establishments is discussed, the main mission of such a service is both the possibility of further employment and graduates' implementation of the knowledge they have gained with help of these services (Kharlamova & Sazonov, 2014).

If one refers to legislation, it is possible to explain the educational activity of a higher educational establishment as activity to the extent concerning conduction of the primary mission of the education establishment; i.e., training and labor market launch of definite high university degree specialists, retraining of specialists, advanced vocational training.

All educational activity efficiency indices for higher education establishments, in accordance with the procedure proposed by the researches T. V. Terentyeva and M. N. Kulakova, are divided into three groups (Terentyeva, 2012).

The higher education establishment, which efficiency of educational activity refers to the third group, is in the "high-risk group"; i.e., less than half the graduates of this institute work within their specialty. If the establishment demonstrates such indices over the course of three years, its further existence on the market for educational services is subject to being called into question.

The higher education establishment, which efficiency of educational activity refers to the second group, is in the "average class"; i.e., more than half the graduates of this institute work within their specialty. If the establishment demonstrates such indices, it should carry out a deep self-examination, find its weak traits, and possibly progress them towards optimal indices.

The higher education establishment, which efficiency of educational activity refers to the first group, is a "leader in the market for educational services". Its main objective is possibly to maximize its indices, rather than decrease them. Such establishment is worthy not only to be highly ranked but also to be encouraged by the state through bonus supplements.

The financial stability of higher education institutions is the condition of its funds, their allocation and use, which provides the performance of the main activity and the development of a higher education institution, based on capital growth using both budgetary and extra-budgetary funds, while maintaining solvency under the acceptable level of risk (Baitova, 2014).

To provide financial sustainability to an education institution in currently changing market conditions, it is necessary to constantly monitor the market situation of education services, at the same time critically evaluating its own position in the market. Moreover, the expansion of non-state education institutions' activity has resulted in a dramatically intensified competition in higher education, in an increasing struggle for the survival of state education institutions, in a struggle for every student and every penny.

The systematization of scientific works about financial sustainability evidences the presence of a large number of various methods. The main methods are as follows:

• Comparative analysis and grouping;

• Break-even analysis;

• Coefficient method;

• Integral method;

• Factor analysis and economic and mathematical modeling;

• Matrix method;

• Fuzzy-set-theory-based methods;

• Expert polls.

It is possible to define the financial sustainability of an education institution with the method proposed by Kelchevskaya N. R. (2014). The algorithm is as follows:

1) calculate the absolute indices of the financial sustainability of an education institution (Table 1).

Table 1. Absolute indices of financial sustainability of education institutions (Note 1)

Index	**Symbol**	**Meaning**
1. Availability of working capital including:	E_c	Equity - Fixed assets and invested funds
Budgetary funds	$E_{сб}$	Budgetary funds – Fixed assets and invested funds
2. Availability of working capital and sources of long-term borrowed funds to form inventory and expenditures	$E_т$	Working capital + Long-term debts
3. Total value of major sources of funds to form inventory and expenditures	E_e	Working capital + Long-term and short-term debts
4. Surplus or deficiency of working capital	+/- E_c	Working capital – Inventory and expenditures
5. Surplus or deficiency of working capital and sources of long-term borrowed funds to form inventory and expenditures	+/- $E^т$	Working capital and long-term borrowed funds – Inventory and expenditures
6. Surplus or deficiency of major sources of funds to form inventory and expenditures	+/- E_e	(Working capital + Long-term and short-term borrowed funds) – Inventory and expenditures

2) calculate the 3-D index that allows identifying a proper type of financial sustainability for an education institution:

$$S = \{S_1(x_1); S_2(x_2); S_3(x_3)\} \quad (1)$$

The function S(x) is defined as follows:

$$S(x) = \begin{cases} 0, & x < 0 \\ 1, & x \geq 0 \end{cases} \quad (2)$$

3) Define one of four types of financial sustainability (FS):

- Absolute FS - S = (1,1,1) – features a high level of an education institution's solvency. The sources to cover expenses are working capital.

- Normal FS - S = (0,1,1) – features a medium level of an education institution's solvency, the efficient use of borrowed funds, and a high profitability. The sources to cover expenses are working capital and long-term debts.

- Unstable FS - S = (0,0,1) – features a low level of an education institution's solvency, the necessity to attract extra funds and the possibility to improve the situation. The sources to cover expenses are working capital, long-term and current debts.

- Critical financial condition - S = (0,0,0) – features zero solvency of an education institution, on the verge of bankruptcy.

Defining a type of the financial sustainability of an education institution will allow the efficiency of both education and funds allocation to be determined and timely measures to be taken to face the threat of crisis trends in its activity.

One of the most popular methods is also the break-even analysis. This method is applied to determine a minimum range of charged services, required for covering the expenses which are growing due to the performance of such activity.

It is essential to consider that the state covers one part of an education institution's expenses in case this institution is carrying out the state professional training task, guaranteeing a minimum level of its financial sustainability.

The other part of the expenses of an education institution should be covered by extra-budgetary funds. To optimize the estimate of their necessary amount, the break-even point is to be found. This point shows a minimum volume of extra-budgetary funds required for justifying all the expenses of an education institution which haven't been covered by budgetary funds.

The main criteria that determine the financial sustainability of an education institution and the efficiency of its financial activity are liquidity and solvency.

Solvency is defined as an index which shows the possibility of an education institution to pay off its debts from the total assets. To determine institution solvency, the following coefficients should be estimated: the coefficient of general solvency, the debt-to-equity ratio, the equity ratio, the current-assets-to-equity ratio.

Being the integral indicator of solvency, liquidity is an index which characterizes the possibility of an education institution to cover its current liabilities. The analysis of the financial activity of an education institution uses the following indices of liquidity:

- Absolute liquidity ratio;
- Acid-test ratio;
- Current liquidity ratio.

To reverse financially sustainable institution, innovative college and university presidents are doing four things:

1. Developing a clear strategy, focused on the core;
2. Reducing support and administrative costs;
3. Freeing up capital in non-core assets;
4. Strategically investing in innovative models (Denneen & Dretler, 2014).

It is necessary to point out that, for a more precise result of the financial sustainability analysis, the obtained results should be compared with similar ones in respect of the sphere of education.

There exist the following objectives of estimating financial sustainability:

• To determine social and market needs and to compare them with a definite higher education institution and its competitors;

• To reveal components imposing either a positive or negative influence on the estimated entity;

- To determine financial and labour reserves for improving economic sustainability;
- To work out a plan to increase financial sustainability.

Financial sustainability can be analyzed periodically for monitoring market needs and existing possibilities to launch new professional training programs and for rising and/or maintaining a higher education institution's competitive power. It can also be a one-time analysis in case of large projects. Federal state budgetary and private higher education institutions provide a list of their FS indices in financial sustainability and financial management efficiency monitoring reports.

There are the following principles of monitoring the quality of financial management and the efficiency of budget expenses:

- To analyze the efficiency of budget expenses;
- To estimate the indices of the entire network of education institutions;
- To define standard values for each index;
- To evaluate the efficiency of a manager's activity by analyzing the quality of financial management.

A general situation associated with monitoring both financial stability and financial management quality in federal state budgetary and private higher education institutions is as follows: 212 higher education institutions, supervised by the Ministry of Education and Science of the Russian Federation, have provided the data and 71 higher education institutions, supervised by the Ministry of Education and Science of the Russian Federation, have provided no data (The Ministry of Education and Science of the Russian Federation).

Here are the complex indices of monitoring both the financial sustainability and financial management quality of higher education institutions, as follows:

1. Indices of budget expenditure efficiency:

1.1. Index of structural earnings;

1.2. Index of quality of income planning;

1.3. Index of quality of estimating expenses from subsidies by certain types of costs;

1.4. Index of quality of estimating expenses from equity by certain types of costs;

1.5. Structural index of immovable property;

1.6. Structural index of most valuable movable property.

2. Indices of financial sustainability (Table 2):

2.1. Share of earnings from income-bearing activities, except earnings from services/works, defined as principal activities on a fee-paid basis in accordance with the Articles;

2.2. Total debt to equity ratio;

2.3. Coefficient of fixed assets renewal;

2.4. Coefficient of non-financial assets increase;

2.5. Share of intangible assets;

2.6. Coefficient of overdue payable accounts;

2.7. Coefficient of non-recoverable receivables.

Table 2. Financial sustainability indices (the Ministry of Education and Science of the Russian Federation)

Indices	Threshold values			
2.1. Share of earnings from income-bearing activities, except earnings from services/works defined as principal activities on a fee-paid basis in accordance with the Articles	≤ 10%		> 10%	
Number of institutions	130		82	
2.2. Total debt to equity ratio	Budgetary		Private	
	<0.3	≥0.3	<0.45	≥0.45
Number of institutions	46	146	13	7

Indices	Threshold values	
2.3. Coefficient of fixed assets renewal	<1	≥ 1
Number of institutions	201	1
2.7. Coefficient of non-recoverable receivables	≤ 0.03	> 0.03
Number of institutions	182	20

3. Indexes of financial management quality:

3.1. Share of non-core staff payroll in total payroll;

3.2. Share of academic staff bonus payroll;

3.3. Coefficient of average academic staff wages in the accounting period.

A background for establishing the system to monitor financial management quality:

-Prospect for the development of education institutions in economic and financial spheres, which is mainly preconditioned by the human factor, i.e., financial policy conducted by the management staff of an institution;

-Liabilities resulted from the cooperation of education institutions with other contracting parties;

-Lack of detailed methods to monitor the financial management of the activity of budgetary and private education institutions (the Ministry of Education and Science of the Russian Federation).

4. Conclusion

Nowadays, the efficient higher education institution must be oriented to solving the following tasks:

- To increase the financial sustainability, economic independence, and flexibility of the management structure of a higher education institution;

- To increase the efficiency of cooperation between higher education institutions and private businesses;

- To increase the efficiency of cooperation between the market for education services and national and regional labor markets, resulting in a more efficient national economy.

Monitoring both the financial sustainability and financial management quality of federal state budgetary and private education institutions should be oriented to revealing their management problems, comparing the existing indices with thresholds and defining the reasons for deviations, changing threshold values in accordance with the analysis of trends for change in evaluation parameters, and developing the recommendations for the management of higher education institutions to attain these parameters.

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Note

Note 1. Table 1 is built by the authors, using the data of the research work by Kelchevskaya N. R., 2014.

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Innovational Mechanisms of Biotechnologies Support in Forest Sector for Providing Economic Security of the State

Svetlana S. Morkovina[1], Michael V. Drapalyuk[1], Peter M. Evlakov[2] & Natalia A. Safonova[3]

[1] Voronezh State Academy of Forestry and Technologies, Voronezh, The Russian Federation

[2] All-Russian Research Institute of Forest Genetics, Breeding, and Biotechnology, Voronezh, The Russian Federation

[3] Voronezh Branch of Admiral Makarov's State University of Maritime and Inland Shipping", Voronezh, The Russian Federation

Correspondence: Svetlana S. Morkovina, Voronezh State Academy of Forestry and Technologies, Voronezh, 394613, Timiryazeva st., 8, The Russian Federation. Tel: 70-73-253-7498. E-mail: postmaster@julygb.vsi.ru

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Abstract

In this article the mechanisms of biotechnologies support in the forest sector are viewed. Forest biotechnology has big perspectives in Russia, allowing fulfilling various socio-economic tasks – from creation of new medicinal drugs to new technologies of growing forests and improving the ecology of forest ecosystems.

It has been established that methods of innovational biotechnologies in forest-based sector are at the stage of scientific research of sectorial scientific and research organizations. In order to successfully implement biotechnologies in forestry, support and greater attention from the government are needed.

One of the mechanisms of supporting forest biotechnologies and innovational development of forest sector could be the creation of Technical research Center for development, scaling, and commercialization of biotechnologies. The place and role of the Center in regional forest cluster is established. A tool of creation of the Center should be a public private partnership which allows combining and harmonizing the interests of the government, scientific and business societies in the sphere of building of bioeconomics in the Russian Federation. The authors emphasize that these Centers of scaling would allow providing full-scale development of bioindustry in regions of Russia in all sectors of biotechnology.

Keywords: innovational technologies, biotechnologies, support mechanism, technical research center of biotechnologies scaling, public private partnership, economic security

1. Introduction

For innovational development of modern economy, three ways of development of technologies are crucial: informational technologies, nanotechnologies, and biotechnologies. Biotechnologies are rightly included into the priority sectors of economy development, for they cover almost all spheres of human life and activities and in certain events (lack of provision, environment pollution, depletion of mineral resources) support the national security of the country (Oloyede, 2008). Nowadays, biotechnology turns from the usual sector into the strategic development factor of economies of certain countries and world economy (Schulte-Bisping, 1999).

The share of the Russian Federation in the global amount of biotechnological production does not exceed 0.2 % (25 years ago - 5 %). For comparison: share of the USA is 42%, the European Union – 22%, China – 10%, India – 2%. (Figure 1). It's estimated that world market of biotechnological production will reach 2 trillion USD by 2025; growth rates for certain market segments vary from 5 - 7 to 30% annually (Berndes, 2003).

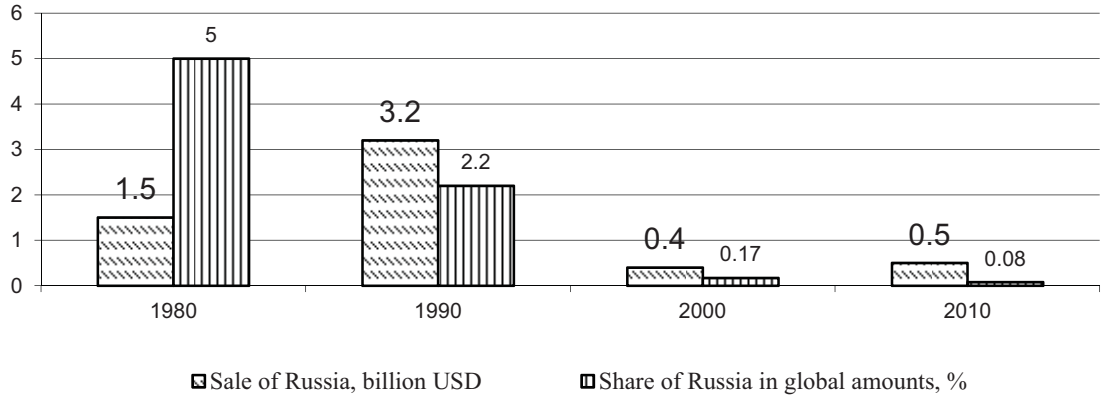

Figure 1. Share of Russia in global amounts of biotechnological production

Researchers of this problematics discern four groups: forest biotechnologies, management of forests, preservation and reproduction of forest genetic resources, and creation of biotechnological forms of trees with given features and biological means of forest protection (Kudryavtseva, 2014).

It is important to note that during the last years, within the forest sector, biotechnologies are used both for forests protection, and for creation of new forms of woody plants with given features, production of planting material, creation of plantation crops with short rotation, waste utilization, and for house-building.

Scientific literature fully proves the necessity of using biotechnologies in various spheres of economy (Belyakov, 2009). However, in practice there is a certain underestimation of the role and meaning of biotechnologies in forestry (Field, 2008). Investments in biotechnologies are not enough; in the structure of Russian venture capital market, biotechnologies occupy only 2% share. At the same time, the necessity for providing a stable functioning of national economy over long term, for creation of new kind of production, and for strengthening ecological frame of the territories creates conditions for development of biotechnological complex of the country. Moreover, beginning from 2012, there functions the Complex Program for Development of Biotechnologies the Russian Federation up to 2020 – Biotech 2020 and work plan "Development of biotechnologies and genetic engineering", which proves the importance of creating innovational mechanisms for biotechnologies support in forest sector for providing national security of the country.

One of the tools of economy modernization, including the sphere of biotechnologies, is development of cluster infrastructure and creation on it basis of centers for biotechnologies scaling. It should be noted that about 10 clusters have formed in the sphere of biotechnologies (Cluster of pharmaceutics, biotechnologies, and biomedicine (Kaluga oblast), Yaroslavl pharmaceutical cluster, Altai biopharmaceutical cluster, etc.). At the same time, the above clusters do no possess the centers for biotechnologies scaling (Popkova, 2013).

2. Materials and Methods

Within the research, a short analysis of the state of biotechnologies in forest sector is conducted, factors which are complicating the commercialization of innovational biotechnologies are shown, programs of biotechnologies support which are implemented by domestic development institutes are analyzed, and the mechanism for biotechnologies support in forestry is designed.

While conducting the research, a complex approach for research of biotechnologies in forestry was realized; the sources of information regarding the tools of support of biotechnologies in forest sector were regional informational resources, data of monitoring of printed and online business and specialized issues, analytical reviews, and materials of marketing and consulting companies for the period of 2009-2013.

The research assumes that mechanisms for biotechnologies support in forest sector are necessary, first, for improving environmental situation by means of increasing areas of good forest ranges, expansion of possibilities for using recreational function of forests, and, second, for using the "quick" forest technology in order to solve the problems of soil erosion and realization of development potential of cellulose and paper and furniture trade.

In order to determine the priority forms of support, it is necessary to study the demand for "green" biotechnology production and condition of forest science in whole which determines the creation and transfer of technological

solutions. For conducting of research, informational letters with questionnaires and offers for participating in the research were prepared and sent (including e-mails).

While conducting the research, the following methods of comparison, collation, polling, and examination were used:

- Polling of employees of leading institutions of forest science;

- Determining, systematizing, and establishing importance of factors which determine the creation, development, and scaling of biotechnologies in forest sector (giving priorities), and accommodation of the experts' opinions was performed on the basis of calculation of Kendall's coefficient of concordance;

- Desk study including analysis of current demand for production of biotechnologies in forest sector. During the desk studies, experience and forms of biotechnologies support were studies, and infrastructure of support at regional level was evaluated. Based on the comparative analysis, vectors of biotechnologies support in forestry were determined.

A significant part of the research results in the sphere of forest biotechnologies was often discussed at the conferences of various levels. The aim of the present research is not only to view and summarize the scientific results of research in the sphere of forest biotechnologies, but to find a possibility for their practical use, including scaling, in forest sector.

3. Results

At the present time, the condition of forest resources is considered to be unsatisfactory, which is caused by increase of anthropogenic load, expansion of agricultural activity, absence of appropriate mechanisms of fighting forest fires and forest diseases, and irrational timber harvesting. Balance of forest resources disposal and forest reproduction is shown by diagrams of Figure 2.

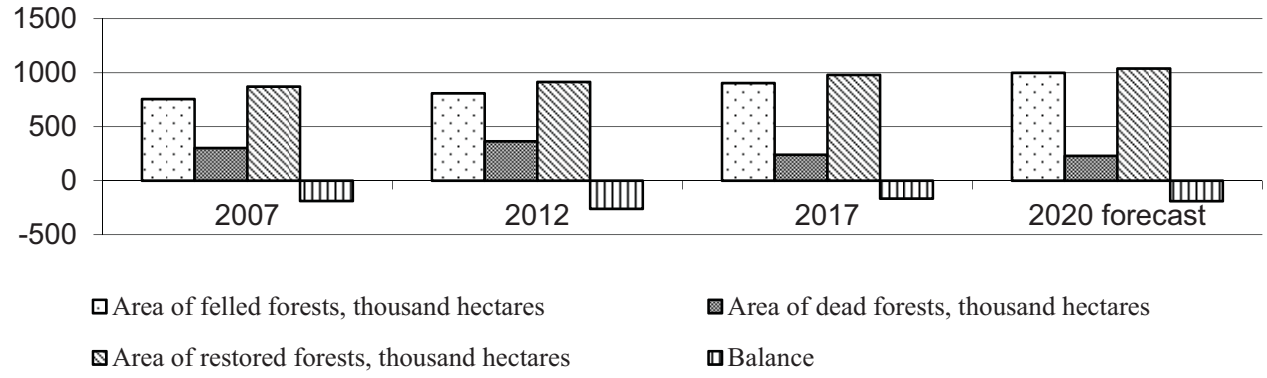

Figure 2. Dynamics of forest resources disposal and forest reproduction and their forecast

The reasons for unsatisfactory forest reproduction are related to, first of all, use of planting material of low quality and violation of technology of forest crops creation. Moreover, in the system of forestry management, forest reproduction is financed on leftovers; in 2008-2013, financing decreased more than twice, leaving 8,055 million rubles, while financing of forest crops creation does not exceed 20% of the above sum. Under limited financing, new technologies of forest reproduction are needed which allow reducing the gap of forest reproduction and timber consuming by means of transfer of forest plantations quickened growth technologies and use of biotechnologies (Morkovina, 2014). Biotechnologies are one of the main directions of innovational economics, together with nanotechnologies and informational technologies. Forest biotechnology possesses a lot of perspectives for development in Russia, allowing solving various socio-economic tasks, from creation of new medicinal drugs to new technologies of forest cultivation and improving ecology of forest ecosystems.

In Russia, in view of lag from the world level of innovational biotechnologies, the methods are still at the stage of scientific development of sectorial research organizations and first cases of practical application. Moreover, in view of existing contradiction, a disagreement of economic interests of the subjects in the sphere of natural

resource use is a serious threat to economic security. Most part of biotechnologies which are used in forestry has vegetative reproduction through tissue culture and use of molecular markers (Pullman, 1998).

Results of inquiry between famous scientist of technical research centers for forest sector allowed determining that the current system of scientific organizations of forestry includes five institutes for scientific research (Russian Research Institute for Silviculture and Mechanization of Forestry, Saint-Petersburg Research Institute for Forestry, Far Eastern Research Institute for Forestry, Northern Research Institute for Forestry, All-Russian Research Institute for forest Genetics, Selection, and Biotechnology), 4 forest experimental stations, and 4 specialized laboratories. The leading institutes on the sphere of forest biotechnologies are Saint-Petersburg Research Institute for Forestry (Saint-Petersburg) and All-Russian Research Institute for forest Genetics, Selection, and Biotechnology (Voronezh) (Morkovina, 2013). A certain experience in the sphere of forest biotechnologies is accumulated in the branch of the Institute of bioorganic chemistry of academics M.M. Shemyakin and Y.A. Ovchinnikov of Russian Academy of Science (Pushchino, Moscow oblast) and in the Institute of forest of Karelia scientific center of Russian Academy of Science (Petrozavodsk).

In these institutions, experience of molecular marking for evaluating genetic variety of forest vegetation is accumulated, banks *in vitro* for preserving forest genetic resources are created, there is an experimental database of perspective forms and hybrids, and genetically modified forms of woody plants with new featured for plantation growing are created.

In the current condition of complication of global situation and decrease of possibilities for transferring leading western technologies, the actuality of development of domestic scientific, technological, and production base of bioindustry rises substantially. This base should be able to provide ecological security of the country and production based on the principles of popular bioproducts for agriculture industry, ecology, etc.

However, there are serious barriers for the development of forest biotechnology. First, it is lack of modern legislation, standards and technical regulations, and ecological standards which hinders development of certain segments of biotechnology; lack of qualified staff and deficit of financing research and development, in particular sectoral science. At the same time, European experience proves that official donations are a main driver for domestic market development.

Most part of questioned employees of the leading institutions of forest science thinks that industrial implementation of innovational biotechnologies need financing at the domestic level.

It should be noted that Complex Program for Development of Biotechnologies the Russian Federation up to 2020, approved by order of Government of the Russian Federation dated April 24, 2012 № ВП-П8-2322, and plan for biotechnologies development, approved by order of Government dated July 18, 2013 № 1247-p., in the sphere of forest biotechnologies there should be created a center for forest biotechnologies, network of DNA laboratories, and plantations of quick-growing forest on the area of 68 thousand hectares. We think that one of the mechanisms of supporting forest biotechnologies and innovational development of forest sector might be the creation of Technical research Center for development, scaling, and commercialization of biotechnologies within the regional forest cluster (Figure 3).

The aim of creating regional biotechnological cluster is acquisition of maximum amount of timber of good quality by the means of decreasing of time and expenses for productive crops – forest plantations.

It is known that plantation growing is oriented at the quickened production and involves high level of using selected planting material, intensive agricultural technology, silvicultural attendance and amelioration (Marris, 2009). With that, for establishing plantations, large amounts of plantation material of quick-growing woody plants are needed. Production of large amounts of planting material of quick-growing and economically valuable forms of woody plants is possible on the basis of clonal micropropagation in the Technical research Center. Thus, creation of the Center should be viewed as an effective tool for supporting biotechnologies in forest sector.

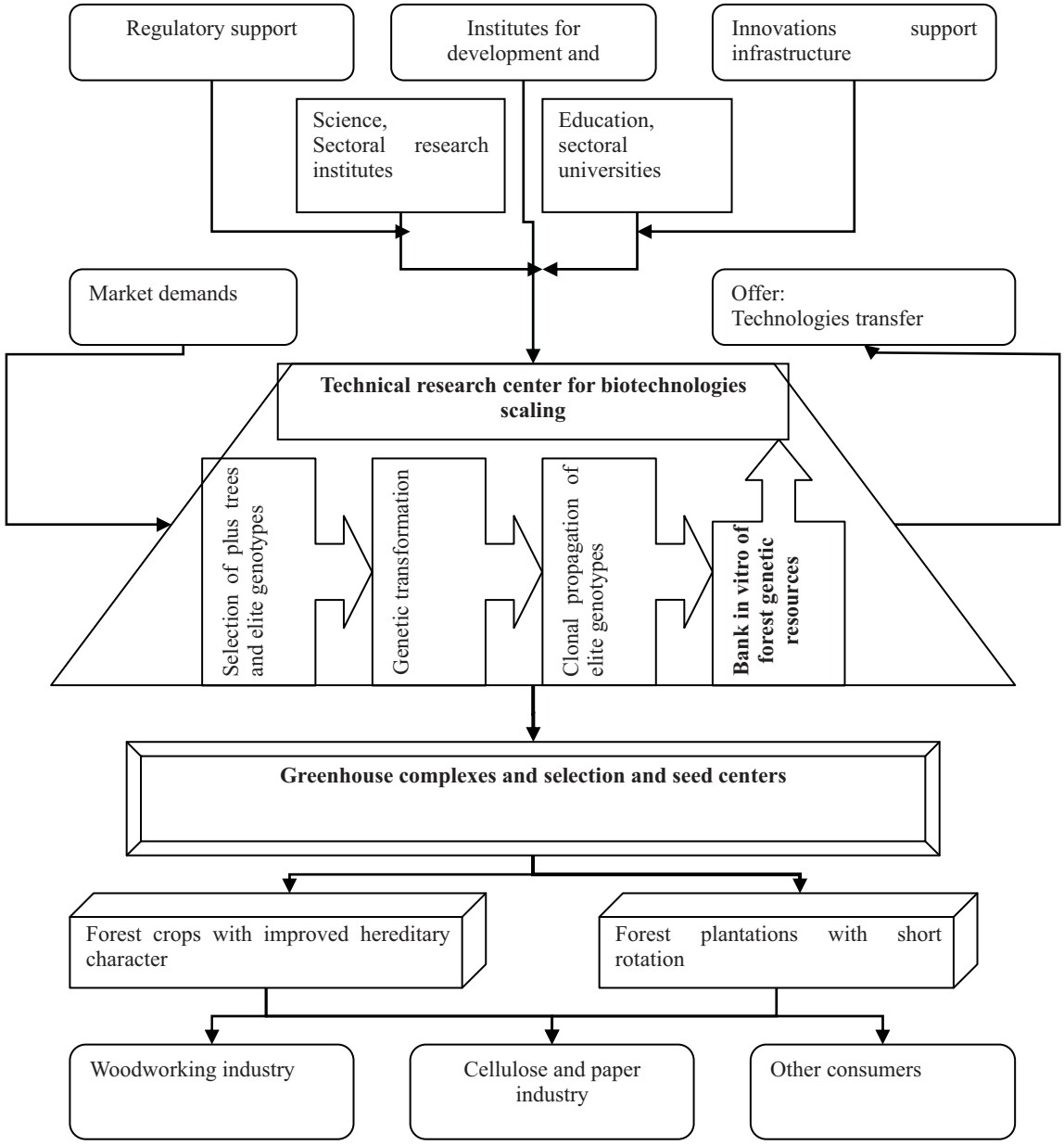

Figure 3. Role of technical research center for biotechnologies scaling in regional forest cluster

It should be noted that creation of the Center would allow solving the following tasks:

- creation of banks *in vitro* for preservation of forest genetic resources;

- development of biotechnological forms of forest crops with improved features;

- transfer of methods for molecular marking for evaluation of woody plants genetic variety, genetic certification of seeds, monitoring phytosanitary condition of forest gardens, controlling origin legality of timber, etc.

- providing production of planting material of quick-growing and economically valuable woody plants on the basis of clonal micropropagation for plantation forest growing.

Thus, the creation of centers for biotechnologies scaling in forest sector would favor implementation of new technologies for artificial forest reproduction which are better than traditional ones due to the quality of planting material.

It should be noted that the Center's functions might be substantially expanded by means of providing variety of services for forest business:

- engineer, research, and consultation services for development of technological processes, technological plans, and technologies for production equipment;

- expert evaluation of technological solutions;

- technological and ecological consulting and audit;

- providing services of prototyping;

- providing services of collective use of equipment;

- providing services of products and technologies development;

- providing services of research and development commercialization (promotion and implementation of new technologies at production facilities);

- services for solving issues of intellectual property;

- training for production facilities in the sphere of biotechnologies commercialization;

An instrument for creation of the Center might be a public private partnership, which would allow combining and harmonizing interests of government, scientific, and business societies in development of bioeconomics in the Russian Federation.

4. Discussion

At present time, forestry is on the threshold of huge changes, caused by development of biotechnologies. This applies to Russia and the whole world.

In practice of forest protection and forest crops creation, various biotechnologies groups are used in different countries (Yanchuk, 2001):

- creation and production of biological means of forest protection against infestants and pathogens;

- clonal micropropagation of plants (including somatic embryogeny) for quick propagation of selected achievements and production of planting material of high quality;

- methods of genetic transformation for creating new forms of woody plants with given character (USA and China are leaders in commercial use of these technologies);

- methods of molecular marking for increasing efficiency of selection genetic certification of seeds and plants, monitoring phytosanitary condition of planting material and forest gardens, controlling origin legality of timber, preservation of forest genetic resources.

In Russia, the priority in biotechnologies belongs to pharmaceutical and medical industry. At the same time, biotechnologies in forestry would guarantee a breakthrough in the issues of preserving biological variety and of reproduction of high-yield forest resources in short time and with minimal cost (Korchagin, 2014).

For creation of high-yield forest crops and innovational technologies, it's necessary to use planting material with enhanced hereditary character (Driesshe, 1976). Biotechnologies are used in forestry within modification of timber tissue, reduction and extraction of lignin (Carson, 2004).

Profits from biotechnology in forestry lie in economic advantage for the sector, including acquisition of "quick" timber with plantation growing, increase of production, lower prices for consumers, and growing modified trees for easier wood processing.

Advantages of biotechnologies from the point of view of ecology lie in preserving biological variety of forest trees and mitigation of global warming (Kirillov, 2012).

During the last years in Russia, a variety of tools for supporting biotechnologies development was used. For increasing efficiency of forestry, a mechanism for supporting forest biotechnologies should be developed; the mechanism should provide formation and realization of priority innovational and investment projects in biotechnologies, including their practical adaptation and scaling.

5. Conclusion

Over the last years, there is a growing interest of scientists, ecologists, and foresters for forest biotechnologies, considering the fact that forest ecosystems perform unique functions in providing ecologic, social, and economic goods and services. During the research, it is concluded that current system of supporting the sectoral

biotechnologies does not comply with the requirements of the time. There are no mechanisms of tax, tariff, and budgetary stimulation of the enterprises which develop and implement biotechnology. At the same time, North-west and Central Black Earth regions of the Russian Federation possess unique possibilities for development of biotechnological production in forest sector which would provide hundreds of work places and favor the development of the regions.

A basis of innovational mechanism of supporting biotechnologies in forest sector of these regions should be technical and research centers for biotechnologies scaling.

At the same time, development of biotechnologies and their commercialization in Russia are impossible without governmental support.

We think that, for providing economic security of the country in forest sector, it is necessary to:

First, improving legislation in the direction of helping implementation of biotechnologies and development of biotechnological production in forest sector;

Second, development of the plan of effective measures of governmental support of biotechnologies development in forest sector, which includes tax and financial bonuses;

- creation of technical and research centers for biotechnologies scaling as an effective mechanism of transfer and commercialization of the results of scientific research and development in forest sector.

Commercialization of forest biotechnologies is possible, on the basis of scaling centers:

- clonal micropropagation of valuable genotypes of woody plants;

- molecular marking for identification and genetic marking of forest genetic resources;

- biological means of forest protection;

- for forest pathology monitoring, monitoring of forest reproduction and control for turnover of round timber on the basis of molecular and genetic methods.

Technical and research centers for biotechnologies scaling which are created on the basis of public private partnership allow providing full-scale deployment of bioindustry in regions of Russia in all sectors of biotechnology and becoming an integrator of existing projects and programs and a self-developing mechanism of generation of new ideas, project offers, and investment (innovational) projects of various state of readiness.

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"Shale Revolution": Consequences for the World and Russia

Alexander F. Jinjolia[1], Vladimir A. Kabanov[1], Elena G. Popkova[1] & Larisa S. Shakhovskaya[1]

[1] Volgograd State Technical University, Volgograd, The Russian Federation

Correspondence: Elena G. Popkova, 28, Lenina Avenue, Volgograd, 400005, The Russian Federation. Tel: 7-844-224-8478. E-mail: 210471@mail.ru

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Abstract

Over the past few years, the attention of many Russian and foreign researchers has been focused on changes in the laws of functioning of the world gas market due to the phenomenon of shale revolution in the US. The most in depth analysis the following aspects of this problem were subjected to: economic and energy, economic and technical, environmental and geopolitical. Within the frameworks of analysis of the economic and energy aspect of the shale revolution, researchers have focused on the assessment of the economic consequences of this phenomenon for the world gas market and market of energy resources. This article presents a comprehensive author study of the consequences of the "shale revolution" for the world and for Russia.

Keywords: "shale revolution", shale gas, geopolitics, Russia, the United States

1. Introduction

Less than for a quarter of a century Russia has gone a way, which took other industrialized countries about four hundred years. Moreover, this way was infinitely more difficult than they had, because it assumed not progressive development within the same economic model, but a complete change of the economic paradigm of development: if the industrialized countries were perfecting the market economy for several hundred years, Russia which was developing administratively planned economic system for 74years, had to switch to a market economy almost overnight and, in that capacity, became involved in the international division of labour.

Participating in the international division of labour, each country exports those resources that it has in abundance to the world market. In Russia, basically, it turned out to be energy - oil and natural gas, which appeared to be very handy, because it was necessary not only to switch to a market economy, but to create a socially oriented market model of management. With increase of the energy prices in the end of the XXth century, all the surplus incomes from the export of cheap energy, especially natural gas, Russia has sent to the stabilization fund - a "safety cushion" in case of economic crises, and social programs for the population which can improve quality of life. Gradually, Russia became the largest exporter of natural gas, which was mainly supplied through pipelines in the EU and in the liquefied form in other countries. Naturally, such a dependence of the EU from Russian gas did not satisfy, first of all the United States, who were afraid of the growing influence of Russia, both in the world and in Europe.

2. Materials and Methods

The global and the Russian markets of shale gas stand as the object of this research.

In the US extraction of shale gas has developed over 20 years. During this period the technology of extraction, providing competitiveness of shale gas on the US gas market, in particular due to minimizing transportation costs for the delivery of products to the consumer, was developed. In 2012, extraction of shale gas has provided more than 8% of the total gas extraction of the US or more than 67 billion m^3. The annual increase in production was 5.3%.

According to the data of the US Energy Information Administration, by 2012 the extraction of shale gas in the US raised up to 240 billion m3, which allowed to refuse to import LNG from Qatar and to start making plans to export their own LNG to Europe and Asia-Pacific markets. As a result, due to the released capacities for exports to the United States shipments of LNG from Qatar to the European spot market gas significantly (by 17 times from 2003 to 2010) increased.

The growth of production of shale gas in the US has led to the fact that in Europe there appeared expectations that in the near future expensive natural gas would be gradually replaced in the market by shale one, despite the fact that in the Western and Eastern Europe population density in areas of possible shale gas production in times higher than in the US. According to the opinion of American experts, large reserves of shale gas may be situated in Poland. Initially, it was assumed that it can be talked about 1.5-3 trillion m^3 (according to some estimates - even 5.9 trillion m^3). Right after Poland reserves of shale gas were discovered in Bulgaria: in August 2010, geologists discovered a field of shale gas, resources of which are estimated between 6 and 8 billion m^3. Nowadays Bulgaria consumes about 5 billion m^3 of gas per year, imported by the country, mainly from Russia (Froggatt et al., 2012).

However, the recent estimates of the reserves made by the Polish Institute of Geology, appeared to be much more modest: according to them, the reserves shale gas in the country are within the range of 346 to 768 billion m^3. However, this is enough to meet the needs of Poland for 35-65 years.

Along with Poland and Bulgaria, Romania the potential for commercial shale gas productions. In Western Europe, according to estimates of experts, Germany, France, Spain and the UK have significant reserves of shale gas. At the same time, a widely used here practice of moratoriums on development of deposits of shale gas makes it difficult to accurately assess reserves. All these countries in one way or another make efforts to deploy exploration and production of shale gas. Thus, in March 2013 Ministry of Finance of Great Britain announced introduction of tax incentives and adoption of measures which are to reduce public opposition to development of shale deposits and, in particular, to calm fears that the "technology of hydraulic fracturing triggers earthquakes and pollution of environment".

However, success the gas content in the rock being the same as in the richest deposits in the United States in order to cover the development costs, which appeared to be higher than it was originally assumed. According to the Shale Gas Europe group, supporting extraction of shale gas on the continent, the potential costs of mining companies in Europe are higher than in the United States. In the US, development of a well costs from 3 million to 11 million dollars, in Europe - from 8 million to 16 million dollars.

In March 2013 the US company Cheniere Energy Partners signed a contract for supply of LNG to the United Kingdom in the amount of 1.35 million tons a year since 2018. Previously, the British BP Group signed two contracts for supply of LNG since 2015, in the total volume of 5 million tons per year.

Besides that, in May 2013 there appeared reports that the largest oil company of the USA ExxonMobil with the help of experts from Qatar was going to build a plant in Texas on production of liquefied natural gas and a terminal for its export with a total value of 10 billion dollars. It is expected that the volume of supplies of LNG for exports would reach 15.6 million tons per year. A little earlier - in April – it was reported that ExxonMobil was also going to build a floating plant to produce LNG in collaboration with the Anglo-Australian mining company BHP Billiton. The costs on this project, according to experts, will exceed 12 billion dollars, and the capacity of the LNG plant will be about 6-7 million tons per year.

This can potentially increase the volume of gas supply in Europe in such a way, so that even without its own shale gas European consumers will be able to gain decrease of prices of Russian natural gas and reduction of its share in the European market. Of course, it will hit the export opportunities of "Gazprom". After all, at the moment 75% of revenue of the corporation accounts for the European market, and to reorient the trunk pipeline system for deliveries to other markets seems to be extremely difficult. Suffice it to recall the story with the construction main oil pipeline ESPO by the company "Transneft" in order to enter the markets of the APR. At present, the "Gazprom" is bound by major investment commitments (amounting to about 25 billion euros) for the construction of gas pipeline "South Stream" to bypass the Ukrainian gas transportation system. Therefore, the gas project, similar to the ESPO, in an easterly direction is hardly possible in the near future. Local "eastern" project of gas supply from the Chayandinskoye deposit through the main pipeline in the region of Vladivostok with building there by 2018 a plant for producing 10-15 million tons of LNG is obviously lagging because, according to some analysts, already 2016 could be a turning point.

The following data (see Table 1) show that satiety of the European gas market has become. Information about the continuing recession in the European economy and the EU's plans to increase energy conservation and energy efficiency of the economy allow to suggest that the negative trends in development of export of Russian gas would remain in the medium and possibly in the long term prospects. From 178.4 billion m^3 in 2012, Europe has been exported 138.8 billion m3, compared with 2011, this figure decreased by 8%.

Table 1. Export of natural gas from Russia

Indicator	2006	2007	2008	2009	2010	2011	2012
Valuable volume, billion US dollars	43.8	45.2	69.1	42	47.4	64.9	62.9
Phizycal volume, billion m3	203	193	195	168	174	185	178

Source: The shale revolution has prospects. DOI: *http://dw.de/p/197qL*.

Though, the gas market of APR faces changes associated with the "shale revolution". For example, there are researches in five directions related to extraction of shale gas, developed in China. They, in particular, include:

- development of equipment for drilling gas wells;
- development of drilling mud;
- development of manufacture of auxiliary chemicals for extraction of gas, etc.

* According to the data of World LNG Report 2011.

These studies are designed to overcome the technological gap between China and the developed countries and to create their own database for extracting shale gas, "as well as would help to significantly reduce the cost-price of extraction of shale gas and to remarkably improve the successfulness of exploration" (Shale gaz…, 2011). The research is conducted in the Engineering School at the China National Petrochemical Company, Sinopec, which is currently conducting operation on extraction of shale gas in the Sichuan Basin in southwest China on an experimental basis (Shale gaz…, 2011).

Forecasts of the leading energy agencies and companies indicate that in the future the world will continue to increase natural gas production from non-traditional sources (see Table 2) (Nyquist & Lund, 2014).

Table 2. Forecasts of non-traditional gas in the world

Organization	2015	2020	2025	2030	2035
BP, million tons		596.1		1518.2	
Energy Department of the USA, million tons	475	577.5	722.5	895	
International Energy Agency, billion tons		*3982*			*5112*

Source: The shale revolution has prospects. DOI: *http://dw.de/p/197qL*.

It is also important to note that when it comes to the fate of the Russian state-controlled gas monopoly - OJSC "Gazprom", it is necessary to take into account the tendencies in the domestic gas market, in particular, negative for "Gazprom" increase the share of independent suppliers of gas to 25%.

Despite such pessimistic for the Russian gas monopoly forecasts, it should be noted that the increase of gas consumption in Europe will continue at least until 2025 and can constitute up to 28%.

The second factor that has a positive effect on the prospects for Russian gas deliveries to the markets of Asia-Pacific region is the consequences of a major accident at the nuclear power plant "Fukushima-1" in March 2011. Due to the tsunami "Fukushima-1" was deprived of electricity, which led to termination of cooling of the reactor, melting down of nuclear fuel and explosion. While extinguishing the fire there occurred significant releases of radiation into the sea and atmosphere. According to experts, elimination of consequences of the accident will take from 30 to 40 years. Nowadays, most of the nuclear reactors in Japan are stopped for an unscheduled inspection of their working capacity, reliability and safety. This led to a sharp increase of purchases of gas for thermal power plants, which cover the deficit of electricity and heat energy.

Besides that, there are serious obstacles in the way of gas exports from the United States. In particular, there is an industrial lobby in the US, which opposes the idea of gas exports. Large US companies, which are consumers of gas, claim that export growth will prevent them to gain benefits from low gas prices in the domestic market. Nowadays, the price of spot contracts in the US in Henry Hub (distribution hub in Louisiana, where eight largest US gas pipelines converge) is 140-150 US dollars per 1000 m^3. The price of gas in Europe is about 370 US

dollars per 1000 m^3, and the average price of a spot contract in the APR (the price of so-called "Japanese oil cocktail" - the index of Japan Crude Cocteil (JCC) is a benchmark for which) is now around 600 US dollars per 1000 m^3, and in 2013 it exceeded even the bar of 800 US dollars per 1000 m^3 (Ebinger et al., 2012).

This affects the position of the US Department of Energy, which, according to representatives of gas companies, delays with decisions on approval of applications for export of gas to the countries that do not have free trade agreements with the United States. The Ministry, in turn, states that in-depth studies must be made for each request, the results of which confirm that the export is beneficial for the United States. Nowadays there are 19 applications for the export of LNG under consideration by the US Department of Energy, but only two projects are approved so far. In particular, in May 2013 the application for export of LNG through the terminal of company Freeport LNG to the countries that do not have free trade agreements with the United States was approved.

Perhaps substantial support in the domestic market will be given to "Gazprom" by the Russian government. Anyway, in the middle of May 2013, the Russian government adopted a resolution about transferring to gas fuel of not less than 50% of public transport in the country. Despite the absence of specific terms of transition to use of gas, the government claims that the regulatory base for it will be prepared by the end of 2013. The Ministry of Industry and Transport Ministry got an order of the Prime Minister of the Russian Federation to reduce or even nullify the customs duties on components for production of gas fuel vehicles.

According to statistics, now in Russia only 100 thousand cars use gas for driving, although this type of fuel is both more ecological and economical than gasoline or diesel fuel. At that the number of vehicles with gas-motor fuel in 80 countries of the world reaches 17 million. According to the forecast of the Ministry of Energy, the number of gas fuel vehicles should grow by 25 times (to 2.5 million units) till 2030, and the number of gas stations by 17 times (from the current 200 to at least 3.5 thousand), which will allow to increase consumption of gas-motor fuel by 20 times in real terms. And this, in turn, will allow to reduce emissions by 12% and will bring the budget additional 5.3 billion dollars. It should be noted that the planned till 2030 level of gasification of vehicles is very mild: it does not exceed the forecast of AEB Automobile Manufacturers Committee for the annual car sales in Russia, which for 2013 is about 3 million units.

3. Results

The emergence of substitute products is a quite natural phenomenon for the market economy, which is a consequence of action of scientific and technical progress. At the same time, if this substitute is among the goods which are of the highest priority for development of the economy in whole, such a product, or the method of its production can become an alternative to the traditional good. The most striking example of this is shale gas, which is a substitute for natural gas and not only for its consumer properties, but also because of availability of technology and the apparent simplicity of its extraction, which has a significant impact on the structure of the global energy market, but it does not lead to a qualitative change due to rather low efficiency of the potential of all modern renewable technologies (Robart, 2012).

One of such energy sources, which have nowadays exceptional qualities of substitute products, is shale gas. Shale gas is a kind of natural gas stored in the form of small gas formations, reservoirs, deep in the shale layer of sedimentary rock of the Earth. Stocks of separate gas reservoirs are small, but they are huge in the aggregate and require special technologies for their development and production of gas (Hadro, 2010). The exclusive feature of shale gas is that it is not fundamentally different from traditional natural gas, however, the technology of its extraction and purification assumes more costs compared to traditional gas (Ridley, 2011).

Shale deposits are found on all continents and, thereby, virtually any energy-dependent country could potentially provide themselves with the necessary energy source. This energy source is currently of great interest in the world community. The main reason is to combine properties of fossil fuels and potentially renewable source in shale gas (The shale revolution…, 2014).

The known "shale revolution" ("shale boom"), in other words, the growth of global production of shale gas, can lead to profound changes in the energy balance in the world. That means, the use of the reserves of shale gas could help some countries to achieve the energy independence, to reduce or to stop the import of natural gas, or even to become exporters of hydrocarbons. Nowadays natural gas can be attributed to the most promising types of fossil fuel within the world energy supply, as its use assumes very low carbon dioxide emissions into the atmosphere, which is the cause of the greenhouse effect, and successfully replaces coal.

Development of extraction of shale gas in the modern world is stipulated by two interrelated reasons: economic and political. The first is constituted by the high real price cost of produced shale gas, more than while usual

extraction of natural gas because of consequences for the ecology as a result of using hydraulic fracturing technology (by pumping under the pressure of tens of thousands of cubic meters of water, sand and chemicals into the well) during extracting shale gas. As a result of fracture gas enters through the fissures to the wellbore and then to the surface (Nyquist & Lund, 2014).

The second reason - political is connected with the fear of a number of countries in the dominance of Russia in the global markets, due to the presence on its territory of huge deposits of energy, including natural gas - the "blue fuel", a relatively cheap and environmentally friendly. Many leaders of the countries, whose mentality has not overcome the era of the "cold war", still think it's not fair, why Russia should flourish and strengthen its economic and political influence, due solely to natural resources, rather than to the development of scientific and technical progress, which requires a much larger efforts and money? (Abiteboul, 2012).

Nowadays, the largest developer of deposits of shale gas in the world is the United States. Large-scale industrial production of shale gas began in America not so long ago, in the early 2000s. As a result of the rapid growth of the industry, in 2010 the United States ousted Russia from the first place in the world for the extraction of natural gas and, according to the International Energy Agency, by 2020, the United States may become the world's largest exporter.

According to official data, in 2013 the US became the world's largest producer of hydrocarbons (oil and gas), leaving behind Russia and Saudi Arabia. The American government has confirmed it in an official statement appeared at the beginning of October 2013, which said that the production of oil and gas in the country in 2013 will amount to nearly 25 million barrels of oil equivalent per day compared with 22 million in Russia and 13 million in Saudi Arabia (Energy from shale…, 2014).

In other words, the economic aspect of extraction of shale gas is enhanced by political considerations: a country that would take the main share of natural gas producer in the global energy market in the near future would determine the price of the resource and trade the technology of its production. Thus, production of shale gas in the US has already had a negative impact on the economic situation of the Russian gas companies and, primarily, of OJSC "Gazprom". In 2012, development of the Shtokmanskoye field was kept on ice, development of the Sakhalin shelf is questionable, because the produced gas was expected to be delivered in the US. The world market is a unit and increase of supply of gas in one region had naturally led to decline of world prices for gas. As a result of decrease of prices "Gazprom" has missed a large part of the profit, and the federal budget in the form of tax revenues with it.

4. Discussion

No matter how attractive today is the idea of an independent power supply each country with natural gas, it seems to us to be little realized under the present conditions and that is why. Beside economic and political factors, influencing the decisions on production of shale gas, there is another factor - ecological, which, in our opinion, at the moment prevails over the other two. This is an exceptional harm to the environment - the territory and the people who live on it, generated by extraction of shale gas. Thus, territories of the United States, where it is extracted, are not more suitable for any agricultural land use and safe living. Not by chance within the United States a number of states have recently passed a law banning extraction of shale gas on their territory (for example, New York state) (Cathles et al., 2012).

Ecological threat is the main limiter of extraction of shale gas in densely populated countries, where the density of living population is very high. For example, it would become a disaster for the EU, although the idea of energy self-sufficiency and further independence from Russian gas seems to them quite attractive, provided that shale gas will be produced not in their territories. Due to the fact that the European countries do not own the technology of extraction of shale gas, the decision on their energy independence from Russia was taken not by them, but by the United States, which intend to produce shale gas to the countries of the EU, but not in the densely populated European Union, but in Ukraine - the territory of the South-East of this country has huge deposits of it. Today, there are located coal mines of Donbass, which to a great extent have already exhausted their resources.

In the South-East of Ukraine, till recently, there lived about 5 million people and, of course, while getting ready for extraction of shale gas in these places, it would be necessary to clean the area from "excessive" population, leaving only those residents who would be directly linked to its extraction. There is one more negative consequence of the potential development of shale gas in the South-East of Ukraine is vast amounts of ruined fertile land, the so-called "Lebedinskii chernozems" which are kept in the Museum of Soil Science in Paris as a benchmark of fertile land. Ukraine, which was just 25 years ago called the "breadbasket" of the Soviet Union (producing bread for the whole USSR), and for which the wheat is still one of the most important export

products, will lose this status. Moreover, left without wheat, Ukraine is unlikely to feed itself, endangering its food security.

Meanwhile, the US interest under the pretext in ridding the countries of the EU of energy dependence on Russia does not have any solid basis:

1) Russian natural gas is cheaper than shale gas produced today, and if to add here also the ecological component, then this burden for the EU can turn out to be very heavy;

2) The price of Russian natural gas to its customers in all countries of the world has always been negotiated, and with emergence of a competitive source of energy, it can be reduced even further;

3) Development of scientific and technical progress will always lead to emergence of substitute products, but that does not mean that rushing to limit the influence of one of the players of the market, we have to savagely withdraw whole territories from the land-use: the number of people on planet earth is growing rapidly, and it should live somewhere. An example of such a gentle, civilized attitude to its territory is China: owning large areas, it prefers cheap Russian natural gas to extraction of shale gas on them, and, thus, is not afraid that Russia's influence on its economy would intensify, preferring extraction and transportation of natural gas into its territory together with Russia.

5. Conclusion

Thereby, the effect of increasing deliveries of shale gas to the global energy market will have a pronounced regulatory nature, the degree of impact on the regional markets will be very different, and very impact would be determined by various factors due to the unique characteristics of each market.

Such phenomena would lead to some geopolitical shifts, but the overall changes of the energy structure of the market and relevant political processes would take place only with condition of illiterate economic policies of major gas players: 1) absence of work on improving technologies of shale gas production in order to eliminate environmentally harmful effects of its production; 2) absence of activities of Russian companies producing traditional gas companies on reduction of costs of its production and transportation to the final consumer (Stevens, 2012).

Emergence of substitute products in the gas market would have a corrective impact on its price and, in general, would lead to its decline, but presence of gas infrastructure in Europe, use of market regulators by OJSC "Gazprom" allows thinking that, despite the claims of many experts about the uncertainty of the global gas market, the situation is quite specific (Tollefson, 2012).

The regulatory impact of shale gas on the world markets really should not be discounted. Shale gas in future periods may provide large reserves of natural gas in some countries, leading to a significant change in the elasticity of demand in all micromarkets, including the European one (Wood, 2011).

At the moment, the policy of "Gazprom" should foresee a change in priorities: if earlier "gas lever" was an effective both economic and political mechanism, nowadays it is necessary to focus on the economic principles of the market management. Otherwise, the reason for the decline of the global impact of OJSC "Gazprom" would be not the very appearance of shale gas, but the reduction of the share in the global market of traditional gas (Shale gaz…, 2011).

In Russia, shale gas is not extracted and the prospects for its further development are while unlikely, though, according to the opinion of Academician Alexei Yablokov, shale gas could become an alternative to nuclear power plants in some parts of the world, which would lead our country to a new level of development through its own development of STP in all sectors, including its energy sources (Ecological results…, 2012).

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Potential for Use of Foreign Experience in Evaluation of Strategic Sustainability of Enterprises Relating to Transition of Russia's Economy to Strategic Path of Development

Galina P. Dovlatyan[1], Elena I. Makeeva[1], Natalia T. Oboymova[2] & Elvira Y. Cherkesova[1]

[1] Shakhty Institute (branch) of South Russian State Technical University, Shakhty, The Russian Federation

[2] Institute of service and enterprise (branch) of Don State Technical University, Shakhty, The Russian Federation

Correspondence: Natalia T. Oboymova, Institute of service and enterprise (branch) of Don State Technical University, 147, Shevchenko Str., Shakhty, Rostov Region, 346500, The Russian Federation. Tel: 7-928-900-3015. E-mail: natascha73@mail.ru

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Abstract

In this article, foreign experience of the rivals is studied, modern condition of national economy and strategic priorities of Russian producers are considered, which is a necessary step for internal and external development of industrial market. Russia's economy, possessing a substantial part of global resources, unfortunately, has a limited number of perspective sectors and occupies a low-profile place in the global distribution of labor. The authors researched the world experience in the increase of sustainable and strategic development of industrial enterprises in the context of its adaptation to Russia's conditions.

The authors present their evaluation of strategic sustainability of industrial enterprises of Rostov Oblast in the industrial landscape of Russia and reveal the strategic priorities of corporate planning, as a vector of perfecting institutional instruments for ensuring strategic sustainability of industry in Rostov Oblast.

Keywords: regional economy, strategic development of a sector, enterprises, foreign experience

1. Introduction

In modern competitive conditions, industrial enterprises require modernization: it's necessary to create innovational conditions for perspective development of Russia's economy and its entry to a new stage of development. It is impossible to reach this without activation of innovational processes of industrial enterprises, which acquires an important meaning for sustainable development of industrial sector. The existing "fall spots" reflect the slowdown of innovational and logical processes of Russia's industrial enterprises and are caused by the fact that industrial processes often feature low-end and aged technologies and innovations, and investment and financial support of their acquisition is rather low. A substantial technical and technological underrun of Russian enterprises of industrial complex from foreign rivals is still observed.

2. Methods and Materials

The authors used general scientific methods of statistical and systemic and functional approach and generalization, analysis and synthesis, as well as private methods of economic analysis – grouping, qualitative and quantitative analysis, expert evaluation, economic and mathematical analysis.

General theoretical issues of studying competitive development are viewed in the works of Gamble P., Cotler F., Merlene P., Porter M., Tailor S., Hayek F.

Scientific analysis of institutional economy and institutional approaches to development of various institutions is reflected in the works of Veblen T., Lakatos I., Nort D., Hodgons J.

Research on strategic management of industrial enterprises are reflected in the scientific works of Russian scientists: Andreev A, Vesnin V., Husyev Y., Egorov D., Ivanov E., Kuznetsov E., Nerovnya T., Ragimov F., Fatkhutdinov R., Faskhiev K.

It should be noted that among the scientists that try to find a scientific answer to real challenges of modernization of Russian industry are the following: Aganbegyan A., Ashkhotov V., Borodin A., Voronin V., Ganalov S.,

Deniskin V., Edelev D., Izryadnov O., Kerefov M., Kostenkov T., Novoselov S., Savvateev E., Tatuev A., Fomin P., Cherkesov E.

Thus, there arises a necessity for development of a proprietary technology of ranking evaluation of industrial enterprises strategic sustainability, based primarily on the business evaluation of executive personnel, analysis of internal environment of industrial enterprise, and defining the role and place of industrial enterprise in institutional environment.

3. Results

Let us study foreign experience of the USA and its instruments, used for sustainable development of industrial sector. Study of industrial sector is conducted by a strategic council which tracks the development of science and technologies. It should be noted that the issues of strategic development of industry and of formation of USA innovational system belong to the competence of (except the Council of Innovations) Administration for Technological Policy (ATP) and Trade Department (Vasilyev, 2009). These bodies are moderators for discussion of key issues as to industrial complex development. Consequently, it should be noted that foreign rivals, in order to ensure sustainable growth of industry, use the program "US Innovation Partnership Initiative" as a mechanism of strategic management of technological policy; this program is aimed at the mobilization of all resources of US industry and cooperation with business society which has a part in coordination and development of programs for development of innovational and investment environment.

All the above mentioned facilitates the rational choice of strategic course for sustainability of industrial sector. In our opinion, increase of social and economic effectiveness of industrial enterprises depends on state economic, regulatory, trade, and other policy, aimed at the stimulation of innovational activity and minimization of risks in technological development and commercialization of the results of research and solutions. Also, Administration for Technological Policy works in close cooperation with industrial companies.

In order to reach strategic effectiveness and sustainable economic growth (at year-end 2014, the USA ranks third in the global ranking according to the parameters (Figure 1)) it is necessary to define the strategic factors which motivate economically active population for development of new products. One of the key factors is a real cooperation of science, education, financing, state policy, and industry.

Viewing the ranking of countries as to sustainable development of industry for 2014, we shall reflect in the diagram the level of development of Russia among 148 countries (Figure 1) (2014).

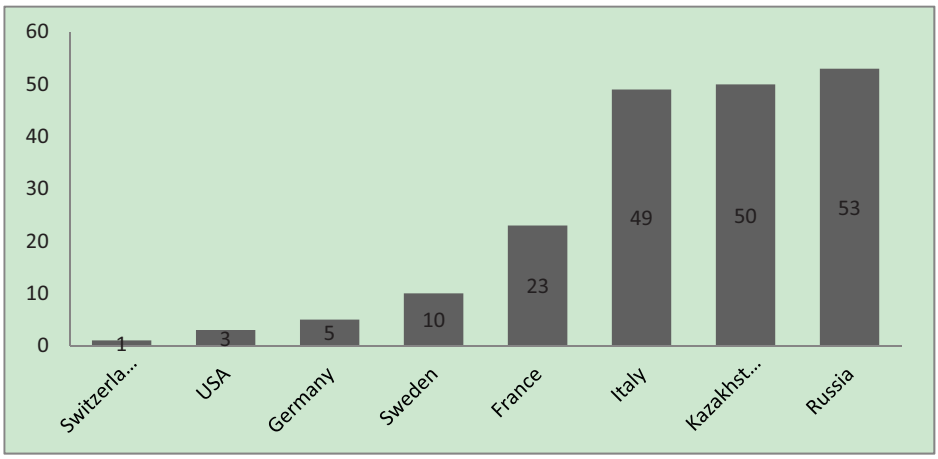

Figure 1. 2014 country rating, as to the level of sustainability of industry (compiled by the authors)

Figure 1 shows that Russia is a global leader as to natural resources, and ranks 53d as to development of industry sustainability. In our opinion, the leading role in the ensuring sustainable development of Russia's economy belongs to innovations which facilitate the constant renewal of industry technological basis, acquisition and release of new production, and effective entry into the global markets.

In particular, the advantages of Japanese industrial companies are not only high labor efficiency, but also low direct expenses percentage wise to general expenses of companies-leaders as to the level of strategic sustainability of industrial enterprises of the USA and German-speaking countries. First of all, it's not just the labor efficiency, but the efficiency of management at all levels.

It should be noted that creation of innovational economy is a strategic course of development of Russia in the 21st century (Cherkesova, Dovlatyan, & Ermakova, 2013).

At present, the issue of strategic sustainability of industrial complex is rather topical; primarily, it concerns not only the population's provision of food and manufactured goods, but the development rate of industrial sector.

Absence of common definition of strategic sustainability of industrial enterprise complicates the formation of adequate approach to its evaluation, which is rather necessary for analyzing the potential for its increase and which is dictated by the use of comparative approach.

Within the expansion of methodological and informational basis for managerial decision making, we offer a comparative analysis of peculiarities of various existing approaches for formation of the mechanism of strategic sustainability of industrial enterprises as a key feature of institutional environment (Table 1).

Analysis of the table allows considering the revealed scientific approaches. Thus, marketing approach to the evaluation of strategic sustainability constitutes in the determining parameters of market situation (revenue growth index), parameters of competitive situation (parameters characterizing the share of industrial enterprise in the market and relative market share) and parameters of the market situation change (they allow forecasting as to the future change of competitive advantages in the market). Within this approach, matrix methods are used (matrices ABL, BCG, GE/McKinsey). Evaluation with the use of matrix methods consists in the analysis of the matrix which is created according to the coordinate system.

Table 1. Comparative analysis of the approaches to evaluating the strategic sustainability of industrial enterprises (authors' development)

Positions	Examples of rendering the strategic sustainability of enterprise	Peculiarities of the approach
	Marketing approach	
Share of market	Capability for creating, developing, and preserving competitive advantages	Market sustainability
	Systemic approach	
Integrity Hierarchy Structuring	Based on the use of integrity and consistency potential	Financial sustainability
	Innovational approach	
Innovation	Capability for permanent implementation of innovations into industrial and managerial activity	Innovational sustainability
	Complex approach	
Technologies level control	Capability for modernization of technological process	Technological sustainability
	Competence-based approach	
Labor potential	Capability for keeping high level of competence and low level of staff turnover	Employee sustainability

For evaluation of customer satisfaction, the methods of interview and statistical processing of the received data, as well as questionnaires, are used. These methods are peculiar for their labor intensity and duration of gathering and processing data, which, however, is compensated by the possibility of revealing the problems in ensuring the sustainability of industrial enterprise.

In modern theory of industrial complex management, the systemic approach is one of the basic ones, allowing logically finding a variety of equal technical solutions. The systemic approach, as a general methodological principle, is used in human activity and in various branches of science. Epistemological basis (epistemology is a branch of philosophy, studying methods and forms of scientific cognition) is the common theory of systems, the origins of which were created by the Australian scientist Karl Ludwig von Bertalanffy (Spivak, 2007). It covers

the development of specialized methodology of research of the systems. The task of systemic approach is expressing principles and notions of systemic research at the level of a single general scientific methodology.

The systemic approach in management is based on the fact that any organization is a system consisting of parts, each of which possesses its own goals. At that, it is necessary to find and evaluate the cooperation of all its parts and combine them on the basis which will allow the organization to effectively realize its goals.

According to V. A. Spivak, it is advised to discern the main principles of the systemic approach: integrity, hierarchy of structure, structuring, and multiplicity.

In our opinion, the meaning of the systemic approach consists in managers being able to perform their specific activity, with a specific role and place in the system.

In order to find the strategic sustainability, various methods are used, most of which are based on the discovery of integral parameters of a specific type of production, depending on the ratio of parameter index to economic index (Novoselov, 2013). The stated indices are discovered by adding private indices for each of the evaluated parameters with regard to weighting coefficients. Sustainability parameters are discovered for each type of activity of industrial enterprise, and then a coefficient of the level of industrial enterprise is discovered, as a weighted average among the parameters for each type of activity, where the weights are productivity and rentability.

Innovational approach to evaluation of strategic sustainability of industrial enterprise is rather topical and possesses strategic and managerial nature. On the one hand, it grants the right to create innovations, on the other hand – to evaluate who's creating them. At corporate planning and forecasting, a special importance belongs to the innovational approach – it is an impulse to learning innovations and entry of the industrial enterprise on the sustainable path of development.

Let us consider the complex approach which studies the complex evaluation of the activity of industrial enterprise and determines not only current, but also potential level of sustainability as to the innovational potential. Evaluation of the current (real) and potential sustainability and their ratio within the integral parameter may vary depending on the method (Novoselova, 2012). The current sustainability may be determined, for example, on the basis of evaluation of strategic sustainability of industrial enterprise, and potential one – similar to the methods, based on the economic effectiveness.

Let's consider the whole institutional angle of the notion of "competence-based approach" as an assembly of interconnected personal, behavioral, and professional competencies, required for work, offering in competitive conditions the specific tools and principles for delimitation of competencies – regarding the sectors of the economy and spheres of society's activities and their reaching the "top-quality result".

4. Discussion

We substantiated that appearance in the business environment of the highest level of management of a new social and professional community will allow ensuring high quality of production of industrial enterprise as to the rivals, which is a key factor of winning leading positions in any field of activity. Issue of quality is very actual in Russia; low efficiency of activity is a risk factor of economic and social development of the country. Analyzing the experience of the developed countries, we made a conclusion: "competencies and labor quality are a symbol and tool of synthesis of all progressive changes in society and economy". The solution of this problem is impossible without qualified managers, the main task of which would be organization of effective work of management of all links (industrial and managerial processes).

A comparative analysis of main socio-economical features of approaches to evaluation of strategic sustainability of industrial enterprise, which we conducted, showed that competence-based approach is one of the most perspective and effective ones in the context of modern stage of development of national economy of Russia.

Within this stage of the research, let us assume that competence-based approach is an institutional tool for reaching strategic sustainability of an industrial enterprise.

The further chain of discourse will be built in the context of scientific reasoning of this research thesis.

Further, it is advisable to consider the key characteristics of industrial enterprises of Rostov Oblast and develop the strategic tools for increasing the strategic sustainability of industry, which will allow entering on a new level of Russia's industry. Let us consider the influence of the parameter of industrial production index at the full circle of industrial enterprises on the territories of Southern Federal District and evaluate the influence on the development of industry sustainability for 2013 (Figure 2).

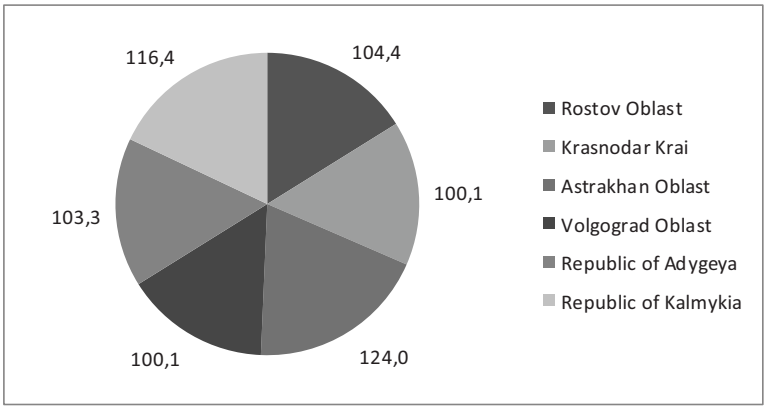

Figure 2. Analysis of industrial production index of industrial enterprises of Southern Federal District for 2013 (original development, compiled by the authors on the basis of the Rosstat reports for 2013)

Let us study the sectorial index of Rostov Oblast against the background of strategic sustainability of Don industry (Figure 3.)

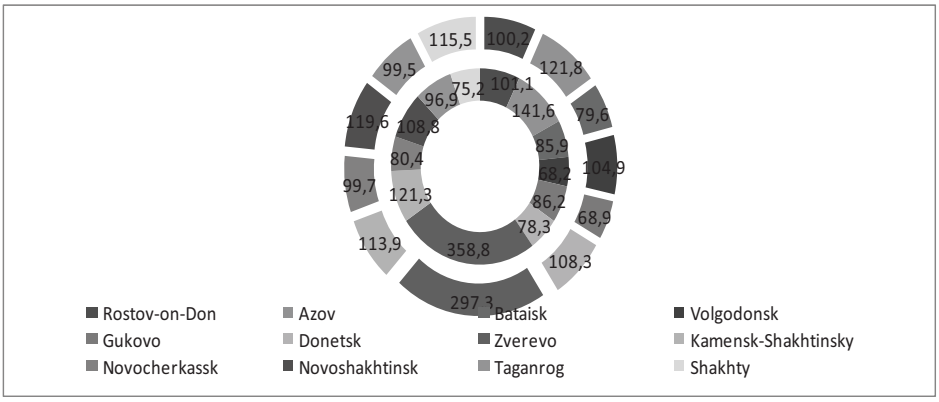

Figure 3. Index of industrial production of industrial enterprises in urban districts and municipal areas of Rostov Oblast for 2013 (original development, compiled by the authors on the basis of the Rosstat reports for 2013)

This comparison vividly shows the high variation of parameters of a specific territory as to the quantity of industrial enterprises on a given territory.

The diagram shows sectorial parameters of average on establishment quantity of employees of Rostov Oblast industry for 2013 (Figure 4).

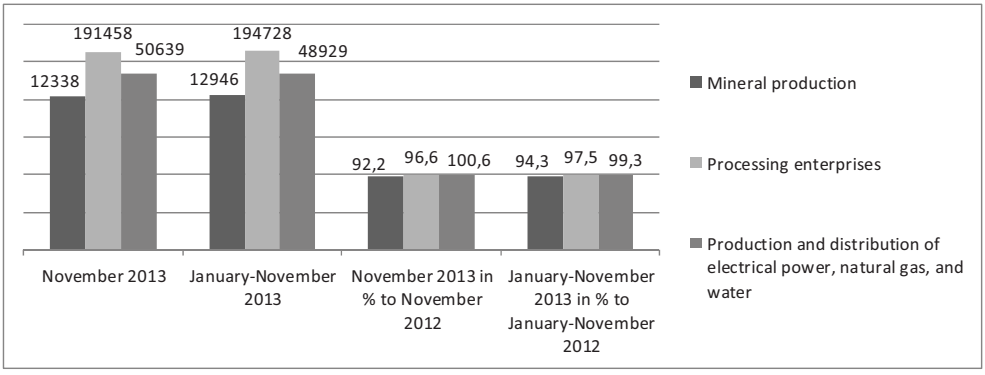

Figure 4. Sectorial dynamics of key features of industry for 2013, compared to 2012 (original development, compiled by the authors on the basis of the Rosstat reports for 2013)

It should be noted that industrial enterprises undergo financial difficulties, which is caused by the reduction of prices for production. From the beginning of 2013, the industrial activity has almost stopped because of lack of operating capital, caused by the delay of payment for final products, delivered to the buyers.

In our opinion, it is advisable to analyze the outline of the knowledge economy, which includes the closely cooperating and interdependent systemic elements:

- informational and communicational technologies;
- human capital;
- business;
- institutional environment;
- national innovational policy.

Based on the above, let us consider the results of the poll which we conducted at the industrial enterprise Rostov Electrometallurgical Works LLC – a metallurgical plant of a new type which is producing top-quality production based on the technology of continuous steel casting and rolled steel. The plant is situated in Shakhty, Rostov Oblast; it occupies the area of 29 hectares, which is possible due to the basic engineering "CONCAST", enabling such compact placement. As the enterprise is unique for metallurgical sector of the country as to the level of automation of technological processes, and the designed capacity of the plant is 730,000 tons of steel and 530,000 tons of rolled steel per year, we chose this industrial enterprise for conducting the poll among the employees.

237 employees were interviewed anonymously. 35% of the employees are males, 65% - females. 65% of the employees are aged 29-39, 35% - 40-49. Length employment is the following: 1-10 years - 84%, 10-20 years - 16%. 8% of the respondents are managers, 92 % - employees of medium and low levels.

The question "What feeling do you go to work with?" was answered by the respondents the following way (Figure 5).

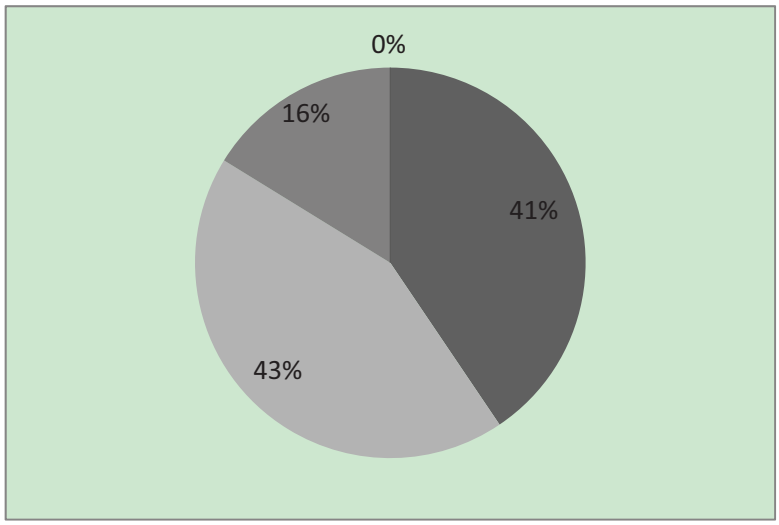

Figure 5. Strategic priorities for sustainable development of industrial enterprise (original development)

Figure 5 shows that 41% of the respondents go to work with pleasure; 43% have various feelings at various times, there's no specific feeling; 16% of the respondents couldn't give the answer. This proves that most of the respondents do not have motivation for labor, and, consequently, their contribution will not be a 100% one - and, consequently, the enterprise's goal will not be realized fully.

The question "To what extent are you satisfied with labor conditions at the workplace?" was answered the following way. 54% of the respondents – "fully satisfied", 32% - "partially satisfied", 6% - "partially not satisfied", 8% - could not give the answer (Figure 6).

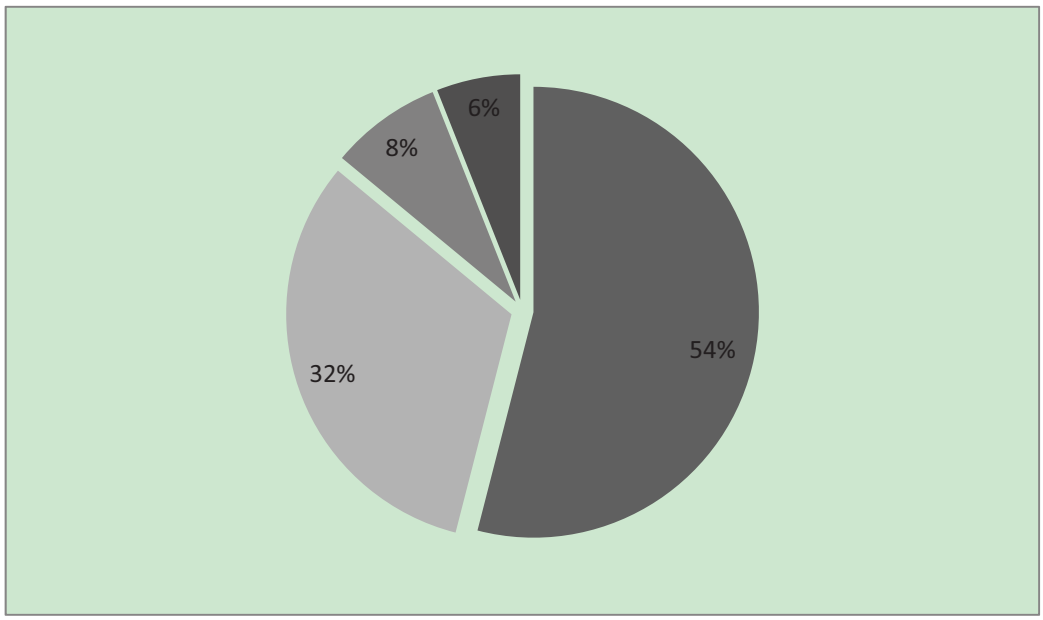

Figure 6. Key characteristics of institutional potential and use of tools for providing strategic sustainability of industrial enterprise (original development)

It should be noted that there are negative issues of the part of employees which are not interested in the work.

The question "What problems negatively influence the result of your work?":

43% of the employees answered the following:

- rate of wages;
- much too heavy workload;
- frequent overtimes, excessive workload;
- 19% of the respondents answered that there was no career development (no promotion), or there were too many urgent errands (constant change of activity made it impossible to concentrate);
- 38 % of the employees could not give the answer (Figure7).

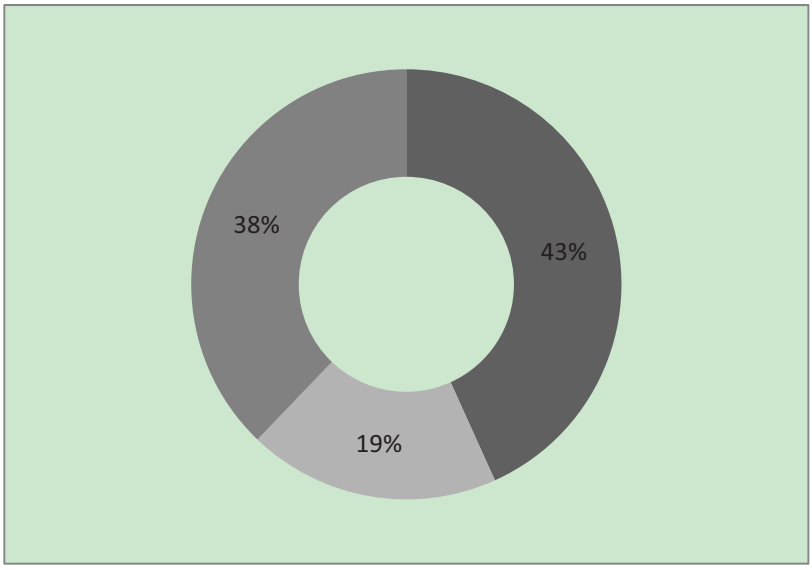

Figure 7. Dynamics of parameters which require institutional transformations in industrial sector (original development)

Figure 7 shows that 100% of the employees have reasons which negatively influence the results of their labor that is reflected on the formation of strategic sustainability of industrial enterprise as a whole, for it is personnel that is a drive of any enterprise.

The request "Note the factors that, in your opinion, could make your work more attractive and increase the labor productivity":

38% of the respondents chose and noted the following factors:

- chances for promotion;
- payment for labor according to the results (differentiated wages);
- flexible schedule;

30% of the employees noted the chances for promotion and good relations with colleagues;

32% of the respondents noted that they wanted recognition and approval from management for good results, and wanted to work without stress and pressure and do the work which would create conditions for studying, development, and perfecting their skills.

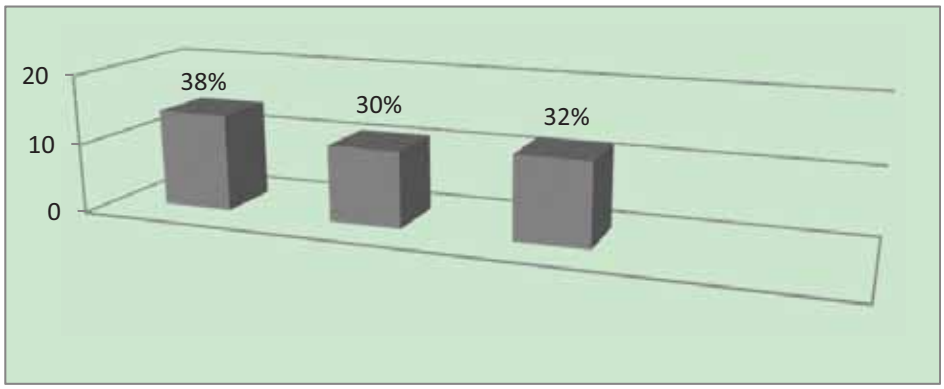

Figure 8. Key characteristics which influence strategic sustainability of industrial enterprise (original development)

Figure 8 shows that specialists are willing to work and develop in the professional sphere, but there are real risks which, in their opinion, slow these processes down.

The question "If you were to be encouraged, what would you prefer?": 4% of the respondents chose a bonus or other stimulating payment, 49% of the employees chose a promotion, 11% – awarding order, medal, honorary degree or other distinction, 16% - overseas travel.

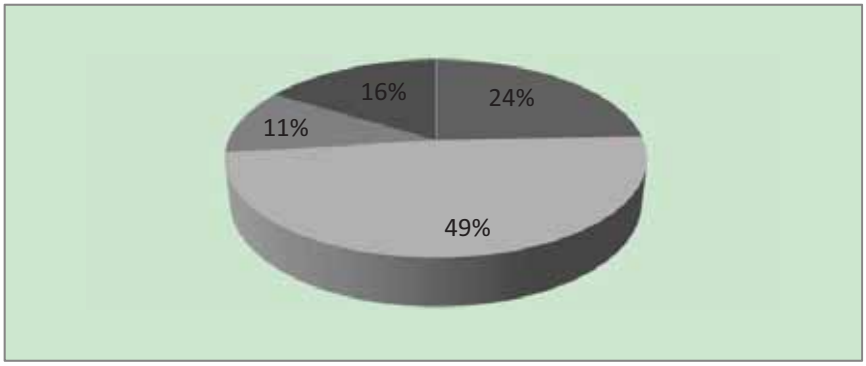

Figure 9. Priorities of strategic sustainability development of industrial enterprise (original development)

The question "Are you going to change the job in the nearest future?": 76% of the employees – "no", 8% - "yes, if there's a variant with larger salary", 16% could not give the answer.

Summarizing the above, it is possible to conclude that the studied enterprises have potential for forming sustainable development which is, however, slowed down by absence of team spirit of the stuff, tense staff morale, absence of motivation, and progressing material dissatisfaction. It is recommended to find and form the conditions which would increase personnel labor efficiency and lead the studied industrial enterprise on the path of sustainable and strategic development.

5. Conclusion

Summarizing the above, we come to the following conclusion: economic difficulties at mega- and macro-level substantially influence the enterprise and its activity, reflecting on the socio-economic parameters (living standards of the population, transition of USSR's economy to market development, global financial crisis, and restructurisation of mining industry). It all was reflected on the activity of former mining territories. Despite all the difficulties, only the professionalism and competence of the managers can help to achieve a new level.

Developing a strategy for reforming economic system, it is necessary to prefer the courses of development which are adequate for institutional structure and mentality of population of a territorial and economic community, or an industrial enterprise.

In order to provide sustainable development of industrial enterprise in modern conditions, we suggest using a strategic instrument – competence-based approach which, in our opinion, is actual for development of innovational activity and is universal and applicable for all branches of national economy.

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Quantitative Analysis in Economics Based on Wavelet Transform: A New Approach

Fernando de Melo[1], Valery V. Maslennikov[1], Elena V. Popova[1], Tatyana L. Bezrukova[2] & Irina V. Kyksova[2]

[1] European Centre for Innovative Management, Plekhanov's Russian University for Economy, Moscow, The Russian Federation

[2] Voronezh State Academy of Forestry and Technologies, Voronezh, The Russian Federation

Correspondence: Tatyana L. Bezrukova, Voronezh State Academy of Forestry and Technologies, 8, Timiryazeva str., Voronezh, 394087. Tel: 7-473-253-7847. E-mail: vglta@vglta.vrn.ru

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Abstract

Recently, a number of new techniques to analyze complex, non-linear and non-stationary economic and financial data have been introduced. One of the techniques that may substitute conventional approaches based on a Fourier transform (FT) is wavelet transform (WT). On the other hand, despite the fact that wavelets have a huge potential enabling accurate representation of relationships between economic variables in the time-scale space, their use in economics is still rather limited with apparent reasons. In this paper, we will examine the use of the wavelets for the analysis of complex economic events and introduce the so-called truncated wavelets and an additional metric that may be valuable for processing of real economic and financial data. The presented approach may also contribute to the enhancement of our understanding of economic phenomena. The results are illustrated on a real example.

Keywords: wavelets, variations of GDP, Heisenberg's uncertainty, Gabor transform, Fourier transform, consumer price index, Wavelet transform

1. Introduction

Economists have usually been attempted to explain and forecast variations of financial and economic data using macroeconomic fundamentals. Most of these techniques are based on the quantitative spectral approach using a "stationary signals" assumption applied to real situations. These approaches usually employ a Fourier transform that translates a time-dependent signal f(t) into its representation in the frequency domain F(ω):

$$F(\omega) = \int_{-\infty}^{+\infty} f(t) \exp(-i\omega t)\, dt \quad (1)$$

One can see that F(ω) is a linear operator and represents a superposition of periodic harmonics (sinωt, cosωt) such that each harmonic does not change its characteristics (period and frequency) over time. This is a severe limitation that does not allow a wide use of a Fourier transform to handle realistic economic and financial phenomena.

Indeed, variations of GDP and stock indices are among myriads of examples when this assumption is no longer valid. In fact, conventional spectral methods have proven to be inadequate to describe the evolutionary nature of realistic time series data in general. The Fourier transform does not allow the frequency content of signal f(t) to change over time and therefore one faces problems reproducing signals that have time-varying features using the Fourier transform. In other words, (1) can tell us how much of each frequency exists in the signal but it does not tell us when in time these frequency components exist.

An analogy is given by human speech: each word of which involves a distinct set of frequencies that last specifically within an exact period of time only.

Let us represent a Fourier transform in a more generalized way:

$$F(\omega,\tau) = \int_{-\infty}^{+\infty} f(t) W(t-\tau) \exp(-i\omega t)\, dt, \quad (2)$$

where W is some filter. We wrote (2) as an attempt to introduce an additional time domain τ and map function f(t) onto a 2-dimentional plane (ω, τ). Actually, (2) represents a Gabor transform that has recently been used for the analysis of non-stationary phenomena. First of all, we will make the following useful observation. All

spectral methods including the Gabor and Fourier representations follow Heisenberg's uncertainty. This uncertainty can be written as follows:

$$\Delta\omega\Delta t \sim 1 \tag{3}$$

The Heisenberg uncertainty states that one cannot represent a signal accurately both in the time and the frequency domains simultaneously. In fact, if we start with a continuous wave (single harmonic) in the time domain, its frequency display shows a single spike corresponding to the frequency of the signal. The significance of this result is that one needs to have the signal continuously on in the time domain to abolish uncertainty in determining its frequency! This means, as an example, that for constructing a perfect Dirac-type spike, we need to employ the information over the whole frequency axes.

The analog of this situation is well-known in physics: to have a well-defined energy, a physical state must last a long time. We cannot precisely know the particle's energy and the exact time the particle obtains this particular energy. The Heisenberg principle poses a very serious constraint on the spectral analysis, especially when the signal is no longer continuous (a usual situation in economics). Besides a Gabor transform introduce a great deal of uncertainty: a width of the window $W(t-\tau)$.

Let us represent filter function W(t) in the Gaussian form:

$$\mathrm{W}(\mathrm{t},\tau)=\frac{1}{\sigma\sqrt{2\pi}}\exp\left(-\frac{(t-\tau)^2}{2\sigma^2}\right), \tag{4}$$

where τ is some fixed reference time and σ is analogues to variance in the Gaussian statistics of random variables and describes the window (confidence interval) in which much of energy is located. Substituting W in (2) by its expression (4) yields:

$$\mathrm{F}(\omega,\tau)=\int_{-\infty}^{+\infty} f(t)\,\frac{1}{\sigma\sqrt{2\pi}}\,\exp\left(-\frac{(t-\tau)^2}{2\sigma^2}\right)\exp(-i\omega t)\,\mathrm{dt} \tag{5}$$

We can use different parameters of the filter function. Let us consider small values of variance. For small values of variance, the Gaussian function may be approximated by the Dirac delta-function spike and (5) reduces to:

$$\mathrm{F}(\omega,\tau)\ \rightarrow f(\tau)\exp(-i\omega\tau) \tag{6}$$

One can see that according to the Heisenberg principle, we need a continuous representation of the signal in the frequency domain to achieve a high resolution in the time domain. Since, this is not the case in real situation, a Gabor transform assumes an empirically chosen window (not small and not large) and reduces to the Fourier transforms of a signal in time stripes in which the signal's mean (expected value) does not change much within the chosen window. This corresponds to the situation when we fix $\sigma.A$ Gabor transform fails in practice for narrow windows due to the lack of continuous data. The problem with the narrow window Gabor transform is that it uses constant length windows of small widths. These fixed length windows give the uniform partition of the time space and the Gabor transform reduces to the sums of band-limited Fourier transforms. Surprisingly, being aware of this limitation, the Gabor transform has extensively been used for the analysis of economic and financial data.

Another problem with the Gabor transform is that when even a wide range of frequencies is available, the fixed time window ($\sigma\ is\ const$) tends to contain a large number of high frequencies and a few low frequencies which results in an overpopulation of high frequency components and a lower content of low frequency components. Hence, as the signal is examined under a fixed time-frequency window with constant intervals in the time and frequency domains, the Gabor transform does not allow an adequate resolution for all frequencies. This is one of the major drawbacks of the Gabor transform that will be resolved using a wavelet transform.

What we wish is to have a reliable mathematical tool that will decompose complex financial and economic data into different scales at each fixed time. To achive this, we will not fix σ as in the Gabor transform but allow it to vary. Having this decomposition we will no longer depend on the Hiesenberg principle inherently embedded in all spectral methods. In this case, we will simultaneously see not only long-term variations, but also short-scale wiggles at each given time. This will be achieved via the implementation of the so-called wavelet transform (WT).

The wavelet transform uses local base functions that can be stretched and translated with a flexible resolution in both frequency and time domains. In the case of wavelet transform WT, the time resolution is adjusted to the frequency with the window width narrowing when focusing on high frequencies.

2. Wavelet Transform

Wavelet analysis is a transform when both time and frequency domains are taken into account simultaneously. A continuous wavelet transform maps an original time series, which is a function of just one variable into a function of two variables: time and scale, providing a great volume of information.

The pioneering work of Ramsey and Lampart (1998a and 1998b) and Ramsey (2002) was followed by Aguiar-Conraria, L. and Soares, M. J. (2011a) and Aguiar-Conraria, L. and Soares, M. J (2011b, Rua, A., and Nunes, L. C. (2012), Rua, A., and Silva Lopes, A. (2012), Crowley and Mayes (2008) among others. For comprehensive review papers, the authors send the reader to Adisson, P. (2002), Crowley, P. (2007), Percival, D. and Walden, A. (2000). De Melo (2011) showed the use of wavelet transform and other modern mathematical methods applied to risk analysis.

The continuous wavelet transform can be presented as:

$$\mathrm{WT[f(a,\tau)]}=\int_{-\infty}^{+\infty} f(t)\varphi(t,\tau,a)^{*}dt \tag{7}$$

where asterisk * stands for complex conjugate. $\varphi(t,\tau,a)$ are basis functions. Usually, these basis functions are derived from the so-called mother wavelet $\varphi(t)$ and are defined as:

$$\varphi(t,\tau,a)=\frac{1}{\sqrt{a}}\ \varphi(\frac{t-\tau}{a}), \tag{8}$$

where τ determines the time position and a is the scale parameter. Let us introduce the following basis functions of a Gaussian wavelet:

$$\varphi(\mathrm{t}\text{-}\tau,\sigma,\omega)=\frac{1}{\sigma\sqrt{2\pi}}\exp\left(-\frac{(t-\tau)^2}{2\sigma^2}\right)\mathrm{R}[\omega,\frac{t-\tau}{\sigma}], \tag{9}$$

where $\mathrm{R}(\omega,\frac{t-\tau}{\sigma})$ is the resolution function. If

$$\mathrm{R}(\omega,\frac{t-\tau}{\sigma})=\exp[\mathrm{i}\omega(t-\tau)] \tag{10}$$

is the monochromatic wave, then this wavelet reduces to the well-known Morlet wavelet basis functions that describe monochromatic oscillations within the Gaussian envelope. In the Morlet wavelet the ratio of frequency over scale that supplies the image with maximum resolution is fixed. In this wavelet, variance σ has the meaning of scale parameter "a" in (8) and τ is the reference point at the time axes. Unlike the Gabor transform, σ may vary, one can see that low scales (small values of σ) capture rapidly changing details, that is, high frequencies, whereas higher scales (large values of σ) capture slowly changing features, that is, low frequencies.

Now we can formulate an important feature of the wavelet transform. First of all, we can associate WT with the Fourier transform. Secondly, we see that instead of dealing with the time/frequency plane, we decomposed the signal into the time/scale plane that is free of the Heisenberg restriction. Instead we tune frequency within each scale gaining the optimal resolution within each scale. These remarkable properties of the wavelet transform, we will use to consider a realistic example.

Example 1. Analysis of the GDP data

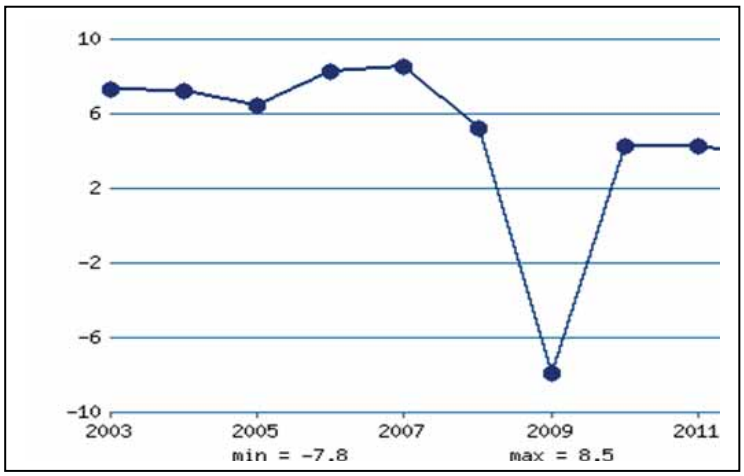


Figure 1. Plot of a Russian GDP data with time

Applying (7) with (9) to the curve depicted on Figure 1, we obtain:

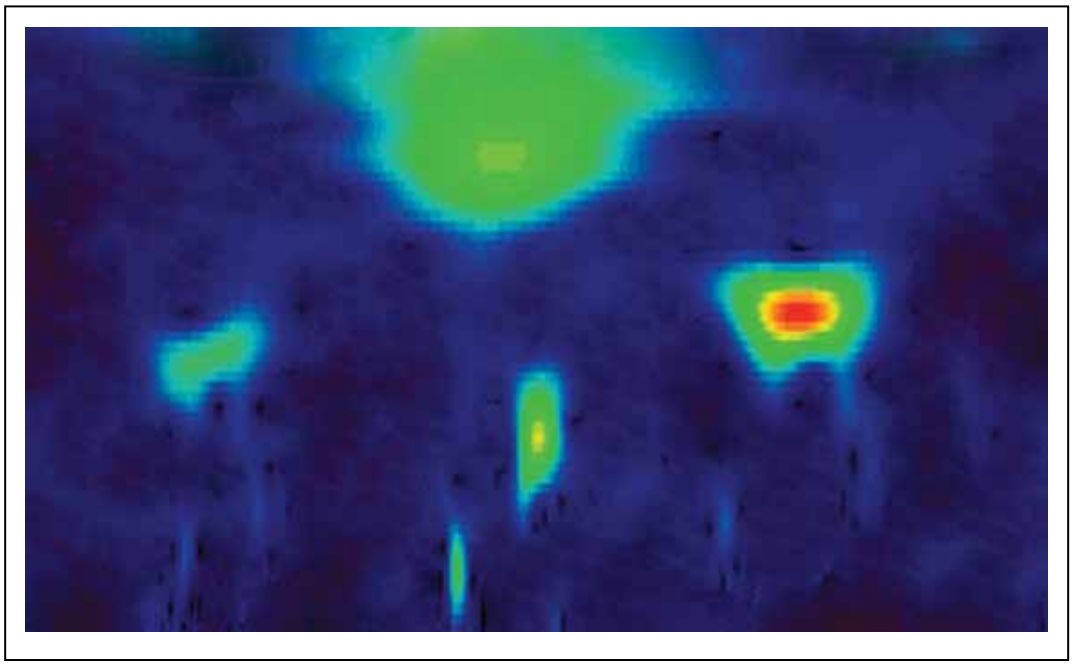


Figure 2. Wavelet transform of the curve presented in Figure 1.

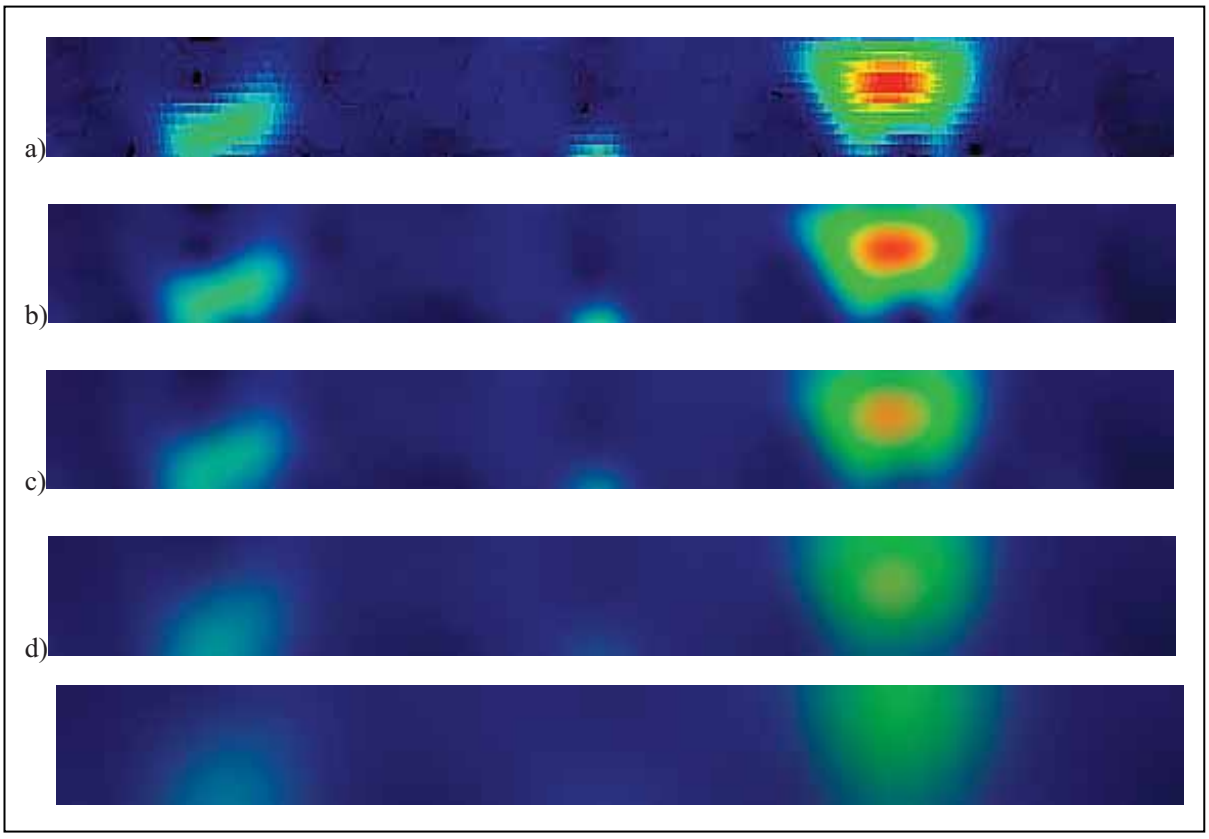


Figure 3. Wavelet decomposition with varying frequencies at a fixed scale (a) $\omega = 8$, b) $\omega = 6, c) \omega = 4, d) \omega = 2$

For the calculations of the wavelet transform we used the following resolution function:

$$\mathrm{R}\left(\omega, \frac{t-\tau}{\sigma}\right) = \sqrt{2\pi}\,\sigma \exp[-\sigma^2\omega^2/2)]\exp[\mathrm{i}\omega(t-\tau)]\,] \tag{11}$$

We found that this representation of the R-function tunes the scale value to the range of frequencies choosing them to obtain maximum resolution possible. This we clearly see at Figure 3.

3. Wavelet Energy Density

Let us now define the wavelet energy density- a measure that calculates energy over fixed values of time and scale. To this end, we will represent the wavelet energy density as:

$$E\ (\tau, \sigma) = |WT[f(t)]|^2 \quad (12)$$

(14) manifests that for bursts, much of energy is concentrated at large scales and rapidly vanishes at smaller scales. This we see at Figure 2. WT maps the GDP curve in a blip that is well-seen at the larger scales of the 2-D plane. It may be further tuned up by adjusting frequency within the Gaussian envelope (Figure 3a), or can be smoothed for further processing (Figure 3c,d).

It is known that GDP is the best measure of the overall condition of the economy because it includes the output of all sectors. Along with, other indicators have been used. We can try to correlate the blip of Figure 2 with other indicators and to analyze what the blip on GDP corresponds to.

Inflation is another indicator defined as the rate of increase in the general price level of goods and services. The consumer price index (CPI) is used as a measure of inflation. The CPI measures changes in the prices paid for goods and services by urban consumers for the specified month. The CPI is essentially a measure of individuals' cost of living changes and provides a gauge of the inflation rate related to purchasing those goods and services. Two other frequently watched inflation measures are the producer price index, which measures prices producers pay for inputs, and the GDP deflator, the series used to adjust GDP for changes in the overall price level over time. Analysts watch trends in these series, as well as interest rate spreads, the yield curve, and measures and surveys of inflation expectations to measure both the level of inflation and inflation expectations in the economy. We will consider inflation data for the time span (2003-2013) presented by the following Table.

Table 1. Monthly inflation data in Russia.

2013	0,97	0,56	0,34	0,51	0,66	0,42	0,82	0,14	0,21	0,57	0,56	0,58	5,91
2012	0,50	0,37	0,58	0,31	0,52	0,89	1,23	0,10	0,55	0,46	0,34	0,54	6,58
2011	2,37	0,78	0,62	0,43	0,48	0,23	-0,01	-0,24	-0,04	0,48	0,42	0,44	6,10
2010	1,64	0,86	0,63	0,29	0,50	0,39	0,36	0,55	0,84	0,50	0,81	1,08	8,78
2009	2,37	1,65	1,31	0,69	0,57	0,60	0,63	0,00	-0,03	0,00	0,29	0,41	8,80
2008	2,31	1,20	1,20	1,42	1,35	0,97	0,51	0,36	0,80	0,91	0,83	0,69	13,28
2007	1,68	1,11	0,59	0,57	0,63	0,95	0,87	0,09	0,79	1,64	1,23	1,13	11,87
2006	2,43	1,66	0,82	0,35	0,48	0,28	0,67	0,19	0,09	0,28	0,63	0,79	9,00
2005	2,62	1,23	1,34	1,12	0,80	0,64	0,46	-0,14	0,25	0,55	0,74	0,82	10,91
2004	1,75	0,99	0,75	0,99	0,74	0,78	0,92	0,42	0,43	1,14	1,11	1,14	11,74
2003	2,40	1,63	1,05	1,02	0,80	0,80	0,71	-0,41	0,34	1,00	0,96	1,10	11,99

The inflation curve is given by the following chart.

Figure 4. Inflation curve with years

In fact, the indicators range from labor market conditions to industrial production, from monetary policy indicators and interest rates to fiscal policy, from regional and domestic to international indicators, from oil prices to stock market indices. Reflecting the complexity of the economy, government agencies review these charts and tables, as well as the results of econometric models, when they evaluate the economic health of the nation. What is surprising though, that powerful mathematical tools that are efficiently used in other fields of science and technology have not found yet the right path in economy. For the sake of simplicity (other indicators we will leave for further analysis), we will consider the inflation data and compare them with the GDP variations.

We will now introduce a variable that will be useful for the analysis of relationships between different indicators. Suppose we have two time-dependent functions (in our case: GDP and inflation variations with years). We perform the Wavelet transform to both functions and will compute WT (GDP) and WT (INF) respectively. Both functions depend on time and scale. We determine the cross-correlation function as:

$$\Phi(GDP, INF)(t, \sigma) = \int_{=-\infty}^{+\infty} WT(GDP)[\tau + t, \sigma]\, WT(INF)[\tau, \sigma]^* d\tau \tag{13}$$

Here, we should make an important remark. Many published papers on economics and econometrics come up with confusing and often erroneous results by the following reason. When a time series is non-stationary (GDP or price curves, say), the limitations of methods that calculate autocorrelation and cross-correlation that assume stationarity are evident. In fact, suppose a time series GDP(t) has a large upward trend as we see on the plot of the GDP EU data. Then a large value of GDP(t)) is more likely to be followed by a large value of GDP(t+δt)). This implies large GDP autocorrelations, not because large autocorrelations actually exist, but because the autocorrelation function is being used for a non-stationary time series violating the stationarity yielding erroneous results.

The same situation one can observe while computing cross-correlation of the signals. To this end, one can come to the following result: a market index time series will strongly cross-correlate with any other time series that has a large upward trend, though there is no true cross-correlation at all. This is a very serious observation and should be taken care of accordingly.

We will now introduce another function that correctly represents the coherence metric of time series. We see that coherence measures (autocorrelation and cross-correlation) cannot be applied to non-stationary signals. The main reason for this is their trends that may contribute to false quantities of coherencies. On the other hand, we know that the trends are represented by large scales. We will then remove large scales from the wavelet transform and will consider the truncated values of the WT.

$$\Phi(GDP, INF)(t, \sigma) = \int_{0}^{+\infty} ZWT(GDP)[\tau + t, \sigma]\, ZWT(INF)[\tau, \sigma]^* d\tau, \tag{14}$$

where Z is a truncation operator

$$Z = \begin{cases} 1 \;\; if & 0 < \sigma < \sigma_0 \\ 0 & otherwise \end{cases} \tag{15}$$

In this case, σ_0 is a fixed scale that represents the trend of a time series. Now $ZWT(GDP)$ represents a stationary signal as well as $ZWT(INF)$ and we can apply the covariance analysis to analyze the coherency of these signals. What we see from (14) is that the wavelet transform acts as an ideal detrending operator that converts non-stationary signals into stationary ones.

We will introduce the so-called cross-correlation measure that has a meaning of cross-energy spectrum distributed over the time-lags

$$E_{\Phi} = max_{\sigma}[\Phi(GDP, INF)(t, \sigma)]^2 \tag{16}$$

With the truncation operator in the wavelet transform plane can form the autocorrelation function that is a wavelet power spectrum:

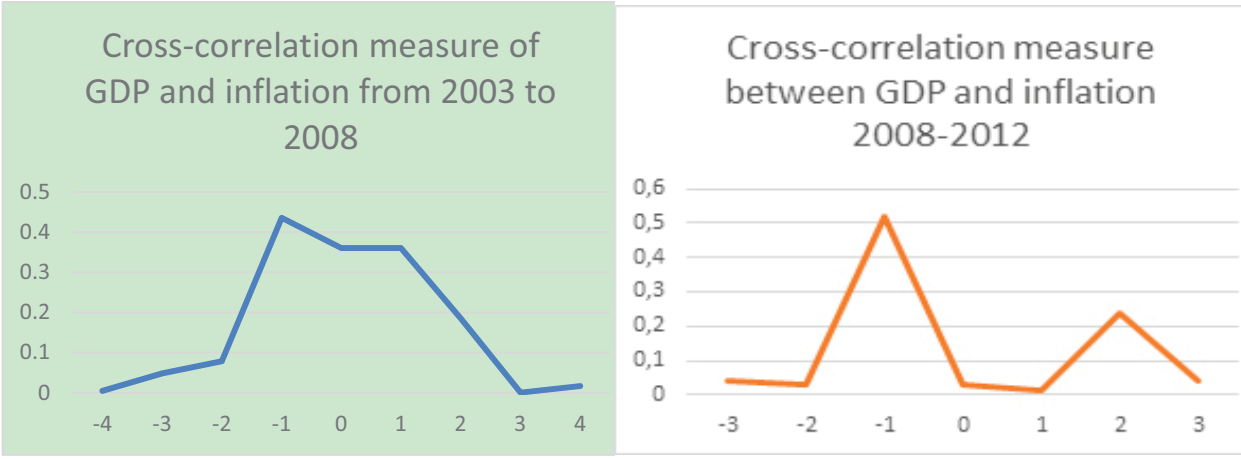
$$PS\,(\sigma) = \int_{0}^{T} |ZWT(f)[\tau, \sigma]|^2 \; d\tau, \tag{17}$$

where T defines the upper limit on the time axes. We can also from now the cross power spectrum CPS that appears to be valuable for the concurrent analysis of two signals f and g.

$$WCPS\,(\sigma) = \int_{0}^{T} ZWT(f)[\tau, \sigma] ZWT(g)[\tau, \sigma]^* \;\; d\tau, \tag{18}$$

Let us consider again two functions: the first one is the GDP plot (Figure 1) and the inflation curve for the same period of time (Figure 4). We will calculate the cross power spectrum of two signals.

This yields



a) 2003-2008 b) 2008-2011

Figure 5. Cross-correlation measure of the wavelet transform defined by (16)

One can see a very good correlation of signals. In the first period (figure a), variations of GDP and inflation match at zero lags, maximizing the cross-power spectrum, while drop in GDP and inflation are seen with the time lag with much smaller values of the cross-power spectrum.

4. Conclusion

As it was mentioned in the paper, the use of wavelet transform in economics and finance is much smaller compared to other fields of science and technology. One of the reasons for this is a common practice to use conventional methods based on a Fourier or Gabor transform, though it is evident that they cannot be applied to real data due to their highly non-stationary characteristics. Another reason is that, the such commonly used in economics estimators as covariance analysis of the available indicators such as GDP, money supply, consumer price index, producer price index, etc. fails again as the cross-correlation analysis fails again applied to wavelet transform.

In this paper, we considered a generalized wavelet that in a particular case of unit amplitudes reduces to the Morlet wavelet. The introduced wavelet appears to be handy for the wavelet processing as it enables even very small details.

Secondly, we have introduce the truncated wavelet transform ZWT that allows to remove large scales and thus trends. The truncated wavelet transform may be very practical and may evoke interest within the economists as they transform non-stationary signals and thus a common cross-correlation analysis used by economists will make sense.

We introduced a convenient cross-correlation measure that is illustrated on realistic signals. This analysis shows some remarkable properties of the truncated wavelets making them powerful tools to be used in economics for the cross-analysis of highly non-stationary, realistic problems.

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Methodology of Risk Analysis and Regional Economic Security Threats

Olga M. Dyuzhilova[1] & Irina V. Vyakina[1]

[1] Tver State Technical University, Tver, The Russian Federation

Correspondence: Olga M. Dyuzhilova, Tver State Technical University, 22, Naberezhnaya Af. Nikitina, Tver, 170026, The Russian Federation. Tel: 7-482-252-4900. E-mail: olga.dyuzhilova@mail.ru

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Abstract

The paper aims to research, diagnose and assess the risks and dangers of systemic nature threatening the region's economy. The purpose of the research is to analyze the theory and methodology of economic security evaluation based on the diagnosis of regional industrial economic risks and identifying sources of risks and priorities for regional economic growth. The paper presents the rationale of regional economic security and reveals the contents of the risks and threats. Evaluation of the safety and profitability stability for regional industries has allowed to reveal the main priorities of economic development of the region and to identify "hot spots", the industries that could be a source of risk and destabilize the economic regional security. Tver region is an example, as its main indicators of economic activity are on the average level of development. It gives the possibility of using tools to support the strategy of economic security at the regional level.

Keywords: economic security, economic risks, direct damage, indirect damage, risk analysis

1. Introduction

Safety is a condition of any objects and subjects' immunity, lacking of both internal and external threats. It is usually considered as an absence of potential possibility of threats appearance and different negative impacts. It is a scientific category presenting an integral form of immunity, reliability, stability and vitality of various subjects, objects and systems.

Security assurance is based on three main principles: eliminating and minimizing danger sources' effects, increasing the protection level, making conditions for the further development.

Any type of human activity associates with a danger level which is characterized by the risk concept (Barseghyan, Molinari, O'Donoghue, & Teitelbaum, 2013).

In order to have the possibility for comparing the level of danger of different management objects and making appropriate decisions, aiming at arrangements system implementation which generates the atmosphere of economic security, is necessary to develop a quantitative assessment of risk (Frolov, 2007).

2. Methods and Materials

Methodology of diagnosis and assessment of economic risks is based on the detailed analysis of the system's internal and external environment in order to generate maximal complete and objective data on potential economic risks and factors that cause them and their identification.

The assessment of an economic risk level is closely connected with the possibility of occurrence of any separate preliminary identified risk; it also depends on the amount of maximal potential financial losses including direct damage as well as lost profit, contractors' possible claims etc. As a result the level of risk is compared to the amount of expected revenues or losses.

Frolov K. V. (2007) is of opinion that "while making a decision which aims to solve security problems it is rational to use the following criterion: "prevented damage – security measures expenses – losses through invalid decisions" " (p. 21).

While analyzing different definitions of "risk" concept one can make a conclusion that they include a lot of other terms and conceptions, the most important ones are 'damage' and 'danger'. So in order to make the quantitative assessment of risk (R) possible, one should use the next formula (1):

$$R = \sum_i p_i \cdot U_i \quad (1)$$

where p_i is a possibility of a negative event,

U_i is an expected damage of this event,

It implies the existence of several possible unfavorable events with different damages and probabilities.

To determine economic risks and calculate the general risk level one should apply statistical methods based on the assessment of profitability fluctuation of regional industries (Tver region example) according to the data of the Federal Statistical Government, Tver branch (http://tverstat.gks.ru/).

For ensuring economic security it's obviously important to asses and predict the impact of all expected threats as well as economic and non-economic influences.

While calculating potential damage it is rationale to keep in mind the concept of direct, indirect and general damage. The direct damage consists of all losses of all national (regional) structures that are in the area of a negative event. The direct damage structure includes direct economic, environmental and social damages. The direct economic damage involves damages and losses of basic and circulating assets including expenses on the development restriction of the management object. The direct environmental damage implies soil and plants degradation, pollution, disappearance and undesirable appearance of water reservoirs, air pollution etc. The direct social damage includes human losses, living conditions changes etc.

The indirect damage (having the same structure as the direct one) includes out-of-direct influence zone losses. The indirect economic damage implies damages connected with the output and product range changes, efficiency level fluctuation, premature dropout of basic production facilities and assets, the necessity of management system reorganization etc.

The indirect environmental damage relates to the climate balance disturbance, animal losses and decrease in their population, natural resources deterioration. The indirect social damage is based on the following factors: human resources losses, manpower reallocation costs, changes in labor character and conditions, provision with social benefits and guarantees, consumption structure changes, public utilities and healthcare services provision.

One of the most important stages in risk and security analysis is an event sequence construction and assessment of damage at each level. The event tree analysis often demonstrates that moving from the initial event to its consequences, the impact of the former is declining while indirect damage assessment is getting more difficult. Therefore the expert's assessment of direct damage' shares can be rather useful for evaluating the indirect damage.

It should be noted that in some industries the direct and indirect damage correlation is 1:30, in some cases 1 to several hundreds.

The risk and security management methodology implies applying such analysis techniques that include all types of danger (engineering, economic, social etc.) and take into consideration today's and follow-up effects.

Risk, as an economic concept, has a subjective-objective nature. On the one hand, the economic system of any level operates in an external environment; its activity is influenced by a number of factors (almost non-dependent on subjective internal managerial decisions and actions). On the other hand, resources management efficiency results from internal managerial decisions made by managerial authorities and certain individuals. These decisions can be rather subjective and personal, their quality depend on people's expertise and their perception of risk. It raises the question of the necessity of diagnosis and assessment of potential internal and external threats which can do harm to the economic system sustainability. It's also important to detect those factors that damage vitally significant interests of the population and economic entities; and develop an efficient managerial mechanism responding to the revealed threats.

3. Results

We suppose that the internal structure of the economic security of any level consists of **four criteria**

1. economic independence which means the presence and possibility of managerial control over available resources (within authorities' limits)

2. stability and development consistency imply the presence of reliable institutional conditions and guarantees for economic activity which minimize the negative effects leading to the destabilization and threatening the sustainability.

3. self-development ability i.e. the potential for economic, scientific and social development, upgrading professional, educational and cultural skills as well as improving the population's standard of living

4. level of integration, dependency and relations with the external environment that specify the system's ability to cooperate with the external environment and entities; identify an appropriate place in the foreign economic activity, the ability to adapt to changing external conditions. The criterion enables to achieve such development and efficiency level that guarantees competitiveness and equal rights in external transactions.

One should take into account that the businesses' economic security (as we've mentioned above) and the general level of the economic risk depend on both objective (external, non-dependent on businesses) and subjective (internal, dependent on expertise, personal qualities and physiological characteristics of the management staff) factors.

The internal (subjective) factors include: the level of financial stability, financial sovereignty and paying capacity; the state of material and technical basis; the structure of revenues and expenses; qualification, responsibility and experience of managerial and other staff.

The external (objective) factors defining the general level of the economic risk can be described as a general financial state of all cooperating entities; market situation; financial flows' sustainability; external environmental activities; the state and quality of the business situation including financial, lending, information, communication and transport infrastructure; political situation; economic stability in the region and in the country in whole etc.

Diagram 1 shows the structure of the economic security.

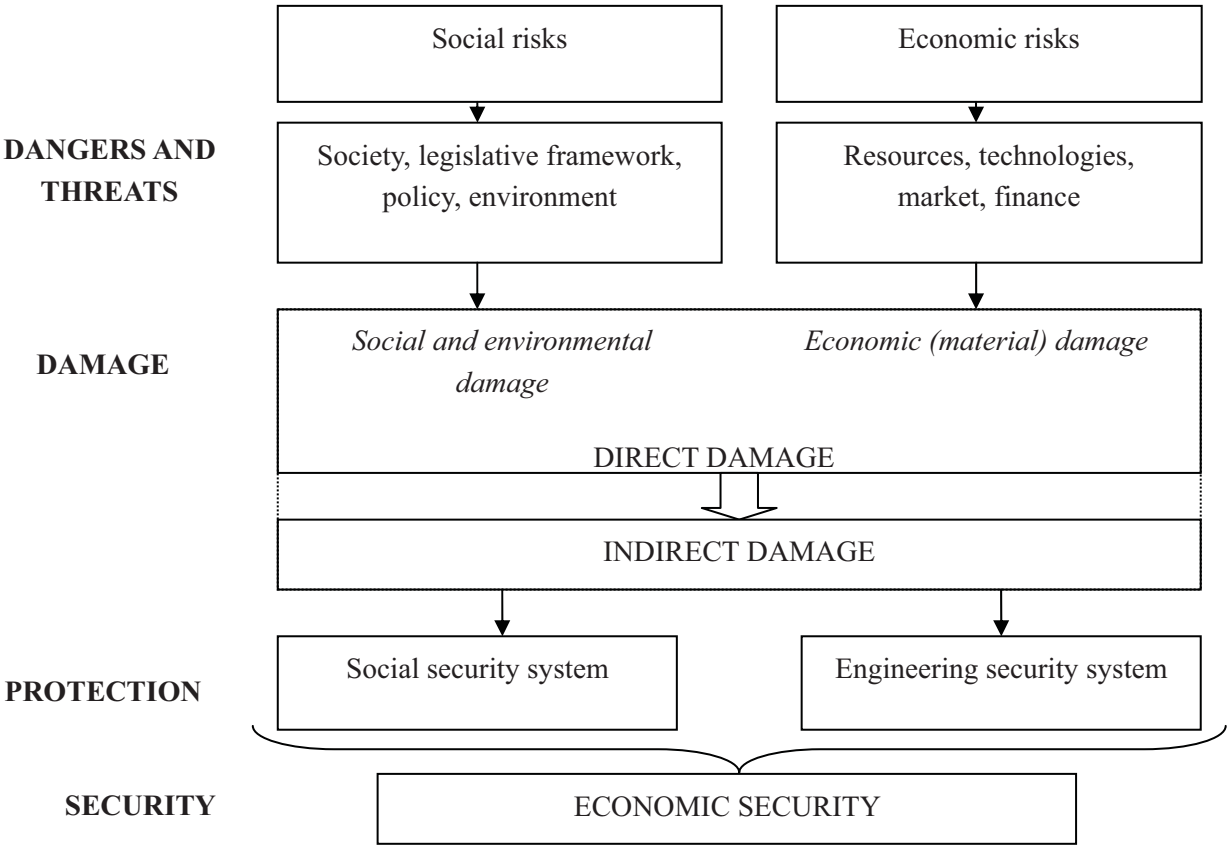

Figure 1. Economic security as the basis for ensuring security of social and economic system

In view of the fact that any risk events involve both direct economic and social damage and more significant indirect damage; ensuring economic security can become the basis for the security of social and economic system of any level, i.e. the economic security is "responsible" for all negative threats and situations that influence the country, region, industry etc.; it can cause some new problems.

The lack of proper mechanism regulating dangers which have a system character and threaten the whole economy, has led to some industries' degradation, first of all such basic infrastructure sectors as healthcare,

education, law enforcement. The situation tears up the foundations of national economic development and ensuring regional and national economic security, that in its turn, decreases the standard and quality of living.

Excessive differences in living conditions can be interpreted as a violation of social equity principles and can lead to the growth of centrifugal forces and separatism, economic security deterioration in some regions and in the Russian Federation in whole.

The main problem of security assessment is to research social and economic risks as well as the environmental factors. The best known and investigated factor nowadays is the national level of economic security (Murphy, Topel, 2013). However socio- economic security and sustainable development are characterized by economic entities at meso- and micro- levels.

The economic security of any level is a complex cooperation system of society, government and economic entities, therefore the processes for ensuring security at international, national, regional and micro- economic levels are closely interrelated. Their integration is based on the similarity of these processes affecting different levels of economic security.

Economic security ensuring can't only rely on losses prevention, it's also essential to guarantee the expected level of revenues.

Considering the fact we can evaluate the degree of regional investment risks with the view of the sector structure of the regional economy (the Tver region example is an average level among the other Russian regions).

Taking into account the development of many socio-economic systems we can conclude that the risks *(R(t))* are caused by unreasonable priorities, disrupting the sustainable development that in its turn weakens the regional position and threatens the existence of the management object.

It's quite rational to identify the individual peculiarities and points ("poles") of the region's economic growth. So it's necessary to define specific businesses which promote the general aim – the regional economic security ensuring. The balanced development of all parts is an essential requirement for the stable development of any system. Therefore all sub-targets can be integrated into the one general goal.

Thus the Tver region ranks 57 among 84 Russian regions in terms of Gross Regional Product (the amount of GRP index is much lower than the average Russian level). According to the data of 2012 the Tver GRP index per head is 57% that characterize the regional economy development and the Tver population's standard of living compared to the Russian Federation (the site's data1)

It's fair to say the production ratio of the added value varies a lot in the Russian regions, the levels of economic development and investment are highly differentiated.

For example the GRP index per head in the Tyumen and Sakhalin regions is about 1,3 million roubles while in the Chechnya and Ingushetia Republics it's only 80 thousand roubles.

In order to identify the most possible threats for the Tver region economic stability in terms of efficiency and fluctuation we are going to calculate the profitability and risks in view of different sectors (income variability).

The calculation of the average profitability and its variations, highlighting the risk level in the Tver region industries, is based on the statistics presented by the Federal Statistical Government, Tver branch for the period of 2005 – 2013 (http://tverstat.gks.ru/).

The results are given in Table 1.

Table 1. The average profitability and stability in terms of regional economic sectors (economic activity) of Tver region for the period of 2005 – 2013, %

Economic activity	The average profitability	Standard deviation	profitability variation level
The total on regional economy	1,29%	0,48%	37,19%
According to the types of economic activity:			
Agriculture, hunting, forestry	1,09%	2,39%	218,83%
Mining	-3,96%	7,77%	196,17%
Processing industries	2,26%	1,31%	58,08%
among them:			
Food industry including beverages and tobacco	1,36%	0,73%	53,44%
Textile and clothing manufacture	-0,81%	1,73%	212,18%

Leather and shoemaking industry	0,18%	0,98%	541,21%
Woodworking and wooden products industry	-4,32%	9,57%	221,59%
pulp-and-paper industry, publishing and printing activities	2,29%	7,16%	312,58%
Chemical industry	2,34%	2,55%	108,81%
Rubber and plastics manufacturing	7,15%	2,07%	29,01%
Other non- metal mineral products	-3,44%	10,45%	303,39%
Metallurgy and metal products	5,14%	3,82%	74,35%
Machinery and equipment manufacturing	-1,60%	6,64%	414,13%
electrical and optical equipment	4,74%	7,33%	154,76%
Vehicles manufacturing	3,96%	1,49%	37,70%
Power, gas and water generation and distribution	-0,35%	0,54%	155,57%
Building	3,62%	3,84%	106,03%
Wholesaling and retailing; vehicles, motorbikes and home appliances maintenance	0,45%	0,39%	87,20%
Hotels and restaurants	4,42%	7,56%	171,13%
Transport and communication	2,91%	2,13%	73,25%
among them:			
communication	7,02%	4,43%	63,17%
transport	0,16%	0,83%	530,41%
Real estate transactions, leasing, service sector	1,93%	1,42%	73,24%
education	0,44%	0,24%	55,53%
Healthcare and social services	1,23%	0,96%	78,15%
Municipal, social and personal services	0,91%	3,46%	380,32%

Notes: the information doesn't include small-scale businesses, banking and insurance sector, government-financed organizations.

Source: based on URL data: http://195.162.22.66/bgd2/DOCL1128/main.htm.

Table 2 defines changes-resistant industries in Tver region. The results show that for the period of 2005 – 2013 in terms of income stability and risks, the rubber and plastics manufacturing as well as vehicles and equipment industries enjoyed the best situation among the other sectors of the Tver economy, especially in terms of profitability variation level.

Table 2. Tver region industries ranking (types of economic activity) for the period 2005-2013 in terms of profitability variation level

Stability level	Rank	Types of economic activity	Profitability variation level
Sectors with the most stable revenues *(Profitability variation level less than 70%)*	1	Rubber and plastics manufacturing	29%
	2	Vehicles and equipment manufacturing	38%
	3	Food industry including beverages and tobacco	53%
	4	education	56%
	5	communication	63%
The average level of profitability stability *(Profitability variation level 70-100%)*	6	Real estate transactions, leasing, service sector	73%
	7	Metallurgy and metal products	74%
	8	Healthcare and social services	78%
	9	Wholesaling and retailing; vehicles, motorbikes and home appliances maintenance	87%
Unstable profitability *(Profitability variation level 100-200%)*	10	Building	106%
	11	Chemical industry	109%
	12	electrical and optical equipment	155%
	13	Power, gas and water generation and distribution	156%
	14	Hotels and restaurants	171%
The high level of profitability and	15	mining	196%
	16	Textile and clothing manufacture	212%

risks fluctuatuin *(Profitability variation level more than 200%)*	17	Agriculture, hunting, forestry	219%
	18	Woodworking and wooden products industry	222%
	19	Other non- metal mineral products	303%
	20	pulp-and-paper industry, publishing and printing activities	313%
	21	Municipal, social and personal services	380%
	22	Machinery and equipment manufacturing	414%
	23	transport	530%
	24	Leather and shoemaking industry	541%

Source: the classification is based on Table 1, industries with negative profitability are marked

Along with the possibility of getting or losing revenues, the risk accounting implies the assessment of probable damage; arrangements' value aiming to prevent possible threats and risks; correlation of the concepts: "prevented damage" and "security implementation costs".

4. Discussion

Risk diagnosis based on profitability assessment should include risk occurrence evaluation in terms of its probability as well as the comparison of direct and indirect damages in case of happening. It raises the question of choosing the main directions of threats' and risk events' occurrence and the issue of priorities. The experts have different and rather contradictory opinions that provoke debates. Thus some of them think social and environmental risks are the most significant ones, others highlight market and financial risks, while the rest stress the importance of resources and technologies.

Thereupon we've prepared the classification of threats and risks. The reasons for the crisis occurrence caused by economic security threats can become various destabilization factors that can be divided into two modules according to the economic security structure described in table 1. The modules (economic and social threats and risks) have the following subgroups which can play more or less important role (according to different analysts).

Module 1. Economic risks and threats

I. RESOURCES AND TECHNOLOGIES (Lee, 2015):

- Deterioration of material and technical basis and technologies;
- Disruption of industrial potential;
- Reducing of research and development plans;
- Research staff disintegration;
- Reducing of proficiency level of engineering and research personnel;
- Irregular resources supplies;
- High level of raw material dependency etc.

II. MARKET (Sandri, 2014):

- Market structure changing;
- Sales markets loss;
- Market position falloff;
- Collapse of competitiveness and competitive advantages
- Monopolies' activities enhancing etc.

III. FINANCE (Gourio, 2013), (Bussière, Imbs, Kollmann, Rancière, 2013):

- Financial situation disturbance;
- Inability to pay;
- Financial liquidity decrease;
- High level of financial dependency;

– Financial sustainability deterioration etc.

Module 2. SOCIAL RISKS AND THREATS

IV. SOCIAL (Imrohoroğlu, 2012), (Coile, 2011), (Dynan, 2009), (Clark, 2004) (Artigea, Dedrya, & Pestieaub, 2014) (Chen & Fang, 2013):

– Social situation decadency;
– migration;
– labor motivation decrease;
– living standards deterioration;
– high rate of social conflicts etc.

V. LEGISLATIVE (Volker & Marion, 2010):

– economic criminality
– economic crimes growth;
– low level of legal safety;
– legislative framework changes

VI. ADMINISTARTIVE AND POLITICAL (Chomaa, Hanocha, Gummeruma, & Hodsonb, 2013):

– changes in institutional conditions and guarantees of economic activity;
– political situation degradation;
– change of leadership and economic policy principles etc.

VII. ENVIRONMENTAL (Rangel, 2003), (Stern, 2013):

– natural environment deterioration;
– disturbance of natural balance;
– change of environmental standards, sanitary code etc.

Clusters I. II, III present economic risks and threats, clusters IV, V, VI, VII reveal social risks and threats. Any risks can be caused by both external and internal factors.

5. Conclusion

We suppose the necessary condition for solving risk and economic security problems are as follows:

– veracious assessment of economic and social system;
– various and reliable risk forecast for extreme social and economic situations;
– anticipatory (or well-timed) decision-making which supports social and economic system development at a proper level of economic security

Research aiming to create effective and reliable tools for ensuring economic security of any level should consider the dependency of the instruments on the complex of goals with corresponding indices, identifying the total development strategy. Risk and threat assessment should analyze not only the possibility of risk events and following direct and indirect damages, but also the necessity of getting income and probability of its loss.

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Modeling the Development of Organization Management System

Boris N. Gerasimov[1] & Kirill B. Gerasimov[2]

[1] International Market Institute, Samara, The Russian Federation

[2] Samara State Aerospace University, Samara, The Russian Federation

Correspondence: Boris N. Gerasimov, International Market Institute; 21, Aksakova St., Samara city, 443030, The Russian Federation. Tel: 79-27-266-2029. E-mail: boris0945@mail.ru

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Abstract

Organization's management system consists of various structural elements. From the position of the functional approach, the structural unit of management activity is functional task management, the realization of which in the course of activities designed control technology. Functioning of many systems management processes and sub-processes is considered. A typical implementation of this act is to solve the set of specific management tasks to achieve the desired goal of a fixed initial situation. The contemporary development of organizations is determined by the necessity to respond to the current challenges and the market trends. In order to react adequately, it is important to use effective means to rebuild the systems of managing the economic systems referred to as organizations. We present a model of organization management system (OMS), and a model of development of organizational processes management system. We review the stages of the said models, including both the conceptual and the technological aspects of organization development based on reengineering. We emphasize the basic advantages of the described models.

Keywords: organization, management system, reengineering, processes, managerial tasks, procedures

1. Introduction

Operation and sometimes even survival of an organization in the market environment depends on the timeliness and thoroughness of its renewal. The most important part in this process is taken by rebuilding and optimization of the OMS, development of its mechanisms of operation and evolution in the competitive business environment (Hammer & Champy, 1993).

There are a few concepts of organizational development, from gradual improvement to a radical change of management systems and their components. Reengineering is described as “the most passionate management concept since movement for quality” and as “one of the key management concepts of 1990s”. Its foundation is usually referred to an article written by M. Hammer (Hammer & Champy, 1993). The work (Harrington, 1991) provides the most detailed coverage of reengineering concept. This concept was further developed in the works (Davenport, 1993) and (Jeston & Nelis, 2008). The following renowned Russian and foreign scientists contributed a lot to the development of this area: M. D. Aistova, F. Guyar, T. Davenport, I. I. Mazur, J. Nelis, E. G. Oikhman, M. Robson, F. Ullah, D. Harington, V. D. Shapiro, D. Short.

2. Method

Reengineering is a redesign of an organization, which becomes possible on the basis of scientific achievements upon recognizing the need for modernization or development and orientation at other values (Harrington, 1991).

Reengineering is applied in three situations (Davenport, 1993):

1) Organization is in a deep crisis, which is reflected in a very high level of costs, mass loss of customers, loss of quality and competitiveness of products, loss of skilled professionals, etc.;

2) The condition of the organization can be considered satisfactory, but its business forecasts for the future are unfavorable, because the organization faces undesirable trends regarding competitiveness, profitability, etc.;

3) The organization is successful and aggressive, and, as a result, it grows fast, and, therefore, its strategy is to leave the competitors far behind and to create unique competitive advantages.

For all the various methods of reforming the OMS, there are still problems in creating such tools, as they have to meet the goals and objectives of the organization, and at the same time, they have to be able to change flexibly

under the influence of market factors, and even to confront them sometimes. The existing models of systems managing the OMS development focus mostly on business processes and do not deal with functional elements of the organization.

3. Model Development Organization's Management System: A Programmatic Approach

Universal model of development, based on reengineering, is shown in Figure 1. This said, the methodology of OMS development and its key elements shall be used in the context of the situation prevailing at the market, and shall be applied to resolve the problems identified when analyzing the organization.

The presented model is based on the *program approach*. The program approach proceeds from the present problems and the opportunities to solve them using the available tools. As compared to the project approach based on what the situation should be, the program approach is based on the real situation and involves choosing the changes that lead to the maximum result.

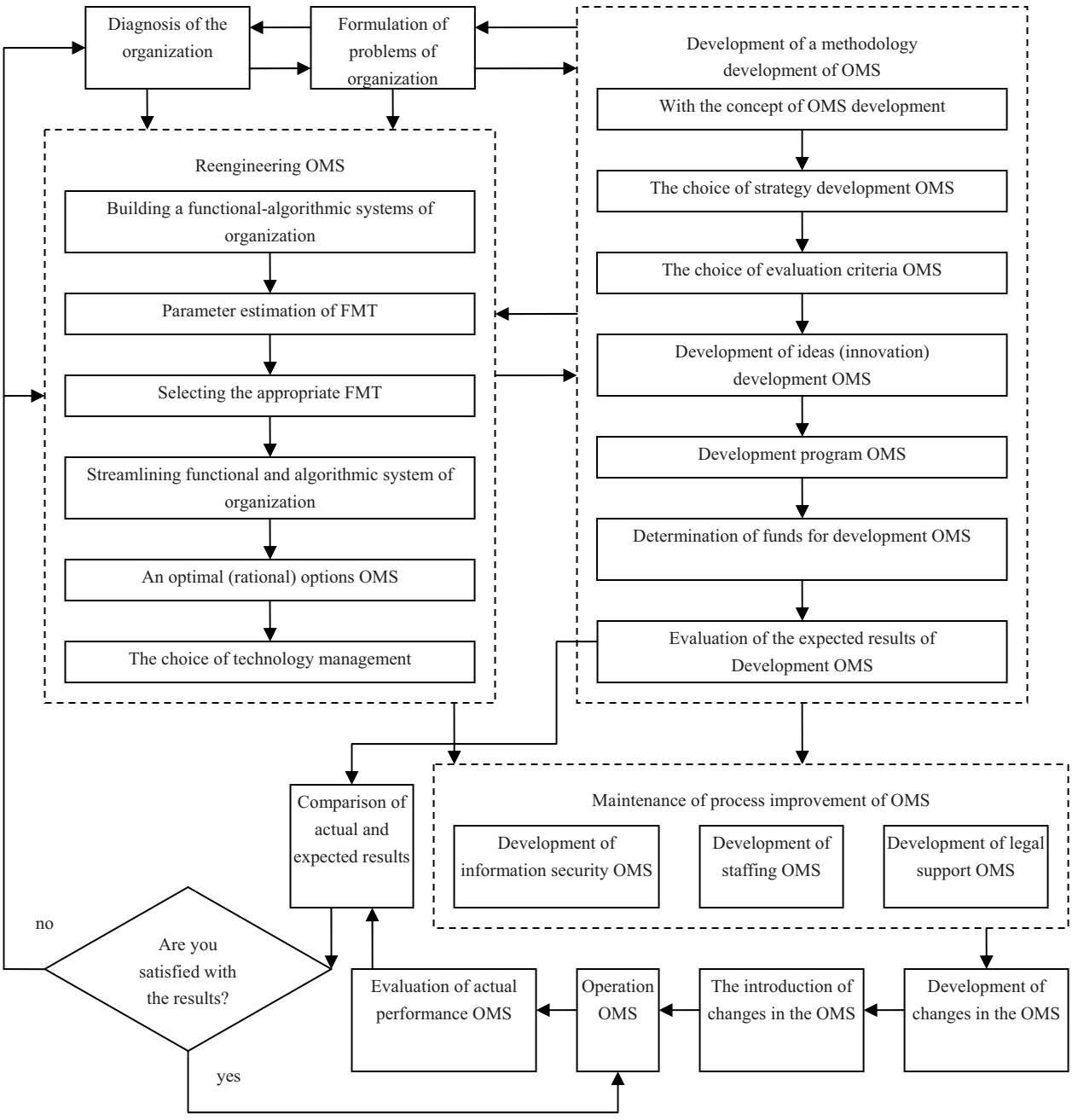

Figure 1. Model of development OMS, based on reengineering

Specific objectives, measures and mechanisms for achieving them are defined during the program implementation, and the target of each stage is determined immediately prior to its implementation, based on the analysis of the current situation and the results of the previous stage. Only the *concept* and *strategy* of the program are determined in advance. The present model uses a program approach, since the direction of reengineering-based OMS development is determined by the existing problems, and the program of solving such problems is adjusted in accordance with the ongoing dynamics of the environment and the capabilities of the organization.

The concept includes a description of the main provisions of OMS development project, and the means (tools) to be used for the implementation of a particular embodiment thereof. The OMS development concept includes the basic provisions on "what to do" and "how to do" the OMS redesign, which requires solving the following tasks:

- develop innovative proposals, enabling the organization to achieve high competitiveness;

- introduce innovative technologies to produce goods with new consumer properties;

- focus on flexibility of management thinking in the event of conflicts, barriers, and deadlocks.

Innovations provide a specific way of implementing a particular variant of concept and strategy of the organization development.

The criteria used for solving the "low level" tasks should match logically the criteria used at the higher level. For the criteria to lead to reasonable results, it is necessary to exclude the possibility of imposing some additional restrictions on them. The main criteria of OMS development include such an increment of income and profits, which covers the costs for introduction of innovative proposals.

Diagnosis of the organization involves defining the point of reference of the study, the starting platform for further work. The main elements of the organization state are the attitudes (points of view), objects, various connections, external influences, structures, scopes, phenomena (processes, circumstances, events), temporal aspects. We propose a method of diagnosis relying on the same methodological basis as the OMS development program.

Any problem is defined by two situations (conditions): the ideal and the real. The ideal (desired) situation is formulated in terms of goals, since the top managers of the organization are not satisfied with the actual situation (e.g., sales, profit margin).

Virtually any problem can be represented as a combination of its constituent elements which are often called tasks. A task is a certain process, the fulfillment of which is associated with some procedures (cogitative, action-related, etc.). The methods for solving the problems are usually sought in a particular area of application or expertise.

The main areas included in the OMS development program are as follows:

- development of new products;

- implementation of measures to improve the quality of products / services;

- improving the efficiency of management and innovation activities;

- ensuring the completeness and rationalization of the functional structure;

- ensuring the optimum number of employees;

- improving the informational, hardware and software support of technological developments;

- staff development;

- improving the working conditions and the system of remuneration.

The program of OMS development includes only the areas that are essential for solving the detected problems with the appropriate resources of the organization. Other areas provide a prospective outlook for further study.

In order to reform the existing OMS or to create a new one, a *functional and algorithmic system of organization* (FASO) shall be established. This system provides for selecting new functional management tasks (FMT) to be addressed in the organization to solve the identified problems.

All FMT, chosen to be implemented in the organization, are evaluated with the expediency parameter, defined on the basis of the parameters of importance (utility) and complexity of implementation which, in turn, are integral and consist of several indicators.

The FASO structure is a directed graph with the nodes representing FMT, connected with information links. The FASO, constructed in such a way, can be arranged by information links, levels, and functional areas. Graph arrangement helps represent the FASO in a form suitable for incorporation of new FMT in the organization. The functional areas of the organization are formed at the weak connections to determine the organizational structure.

The selection of the most appropriate tasks can be performed in two ways: by using the heuristic algorithm or the algorithm based on the Bellman's optimality principle (Bellman, 1960). The new FMT can be deployed in the organization in several phases due to the lack of resources.

After the FASO is developed and the new FMT are classified to a particular area, one of the well-known organizational structures is established.

FMT distribution by task owners within the organization is an important procedure and is performed on the basis of a directed graph, the available human resources and the labor efforts for performing FMT. For this purpose, we developed two algorithms: one is based on the Brooks method, the other - on the purposeful enumeration method of Lemke and Spielberg (Kaufmann & Henry-Labordere, 1977). FMT are distributed in accordance with the qualification of specialists, which ensures that the tasks are fulfilled in time and with the due quality.

The optimal (rational) variant of OMS development is chosen on the basis of several competing options of OMS development according to the previously selected criteria.

Management technologies are applied in particular situations to improve the efficiency of FMT solutions (Gerasimov, 2010). For example, the fulfilment of an FMT “conclusion of a contract” requires using the management technologies (meetings, negotiations, presentations), alignment and implementation of a sequence of specific operations, sometimes under time pressure. Therefore, if a specialist has the experience in using standard management techniques, it should be easier for him to establish a new non-standard technology.

Using the management technologies requires skilled professionals, the willingness of staff to adopt the technologies, and the evaluation of social and psychological characteristics of staff and partners.

As a result of OMS development, the interconnected chains of tasks are defined, the specialists of the organization learn how to implement FMT and how to use the relevant management techniques to fulfill those FMT, and the tasks are assigned objectively to the units specifying the standards and samples of their fulfilment. For this purpose, the following activities are performed: new units are formed, the specialists are appointed to new positions, the staff arrangement is changed, job descriptions are changed, new tasks are assigned to the units, and the tasks are distributed.

The main expected results of OMS development include the change of quantitative and qualitative indicators of the organization and its subsidiaries. These results may be of several types: economic, material, informational, labor-related, social, psychological, and others. Each type is characterized by the corresponding parameters.

In order to determine the actual results of OMS development, the indicators selected in the previous step are evaluated. While no problems usually occur with recording and interpretation of quantitative indicators, the quality indicators may be associated with some difficulties. The parameters shall be registered with the help of questionnaires, checklists and tests which should indicate the new values of social and psychological indicators associated with the change of management of the organization.

The comparison of the expected and the actual results reveal the gains and losses resulting from the OMS development, and major market trends. The analysis performed shall conclude with the definition of activities to help the organization benefit from the OMS development. It is possible that some subsequent unforeseen deviations are identified. The list of recommendations is submitted to the senior management to assess the situation and to take management decisions.

Some stages of the universal model of OMS development can be performed on the basis of a gaming simulation. The gaming model developed by us allows fulfilling promptly the most important stages of a universal model: to define the problem, to select the criteria for choosing the alternatives of the possible solutions, and to arrange the pattern of handling the problem (Jeston & Nelis, 2008). The gaming model can be replaced by game-meeting, focused on the selection of the best option of a management solution in the process of communication.

4. Model of Development Process Management System

The *Process Management System (PMS)* is a set of elements designed for the functional processes of the organization, aimed to achieve the goals. In this case, the object of study is the functional processes of the organization (financial management, operations management, quality management, etc.), and the subject of

management is the managing bodies of the organization (the meeting of founders, top management, etc.) (Kaufmann & Henry-Labordere, 1977).

Figure 2 shows a model of PMS development, which is a science-based pathway of improvement of the organization processes.

The core of the development model of the organization PMS is a set of sub-process structuring procedures in the organization that undergo decomposition first to become sub-processes and, ultimately, to become FMT. The interaction of all components of the processes, and then the interaction of the OMS processes themselves is formed on the basis of the identified FMT.

The model of PMS development begins with the order to analyze the PMS of the organization and is considered an intersubordination of several components to be studied in the organization (Kaufmann & Henry-Labordere, 1977):

- defining the development directions of the organization;

- determining the condition of the management system of the organization;

- defining the state of the innovative capacity of the processes in the organization;

- engineering of PMS in the organization.

Determining the development directions of the organization includes defining the basic parameters of the organization activities which can be determined before, during, and after reforming the organization.

The development strategy of the organization is to concentrate the resources on specific processes and/or their components and to search for the opportunities to implement them at a high level (Gerasimov, 2010).

The essence of diagnostics of the organization at the level of processes is to define and study the criteria, to measure the basic characteristics reflecting the state of technical systems, economics and finance of a business entity, to predict the possible deviations from stable, medium, standard values, and to prevent violations of the normal mode of operation. Diagnostics of the organization includes defining the evaluation features, choosing the methods of their measurement and characterizing these features according to certain principles, evaluating the revealed deviations from the standard, generally accepted values.

It is extremely important to determine the condition of innovative potential of the organization processes. The concept of "innovative potential" became "a conceptual reflection of the phenomenon of innovative activity".

Based on our technique, the innovative potential of particular processes (sub-processes) of the organization, needed for its development, are detected (measured). Using this model allows determining the drawbacks of OMS and their causes, which may become the source of information for the development of PMS based on reengineering.

According to the work (Davenport, 1993), when applying the model of PMS engineering, the following elements of the development methodology of the "organization" type economic systems are taken as a basis: model, mechanism, concept, method, technology, etc.

Presentation of the management methodology elements contributes best to the understanding of processes occurring in the organization, and allows designing the system complexes in the organization.

New universal PMS can be constructed at the level of management problems or at the level of sub-processes. This provides a functionally complete composition of FMT, which covers the selected organizational process.

The model of OMS development consists of several blocks. The model starts with receiving the information on the conceptual (methodological) parameters of the organization, i.e. goals, mission, strategy, and policy of the organizational development, as well as the long-range program of the organizational development (Hammer & Champy, 1993).

The PMS development on the basis of reengineering is a process of identifying the management goals, which are ignored in the organization or fulfilled insufficiently. Identifying these elements is a key step of the present model, since they are to bring the expected results of OMS development.

Forecast of the results of OMS development simulation is an extremely important factor in determining and studying the basic indicators of the organization performance. It can be prepared by an expert group: staff of the organization or a professional consulting company.

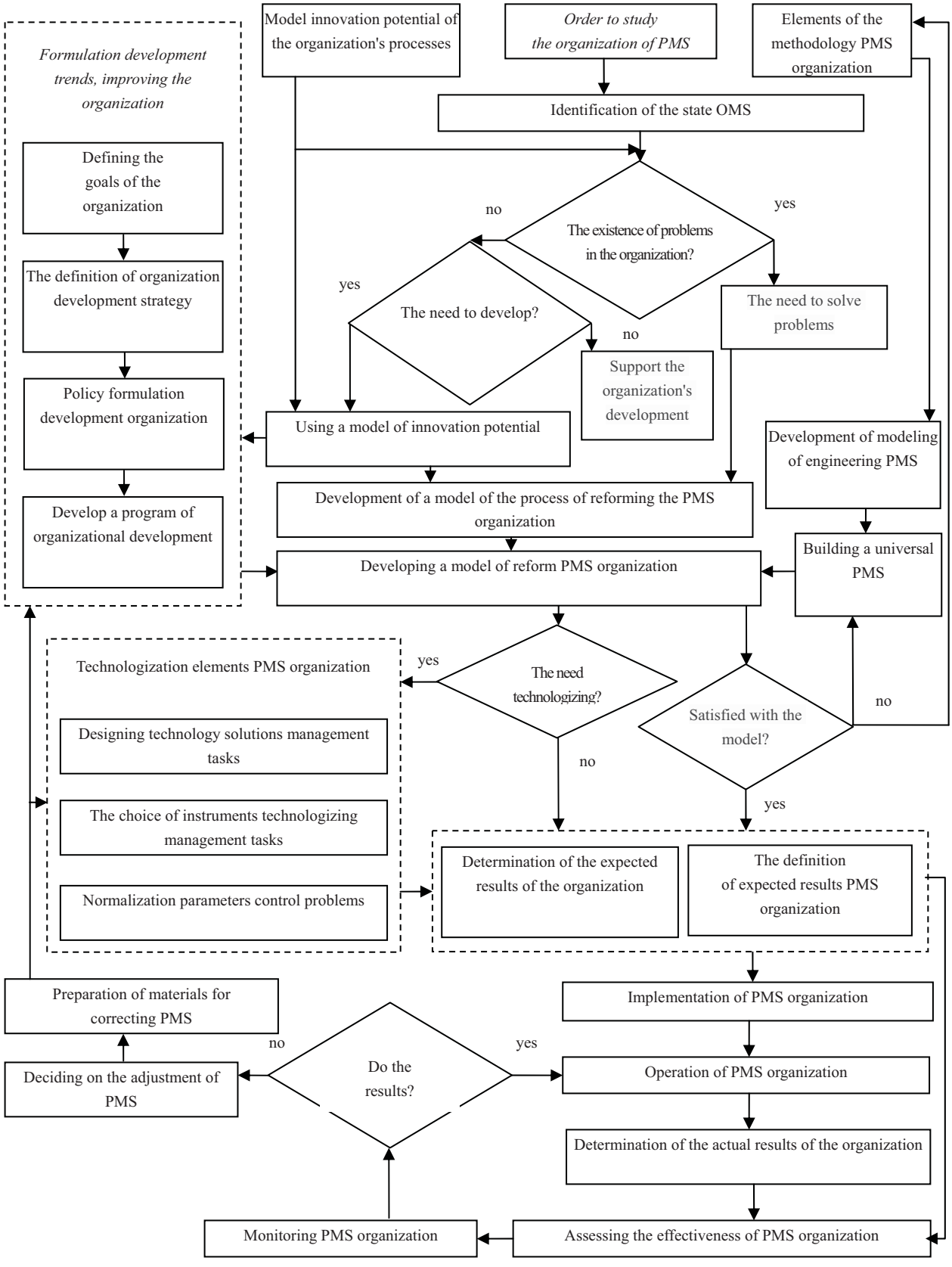

Figure 2. Model of development Process Management System

Competent employees move step by step to consider all the previous stages of the model to determine the adequacy of the process of PMS development, as well as the measures on introduction of new elements in the organizational processes. If the experts cannot present the convincing reasons in favor of the provided options of OMS development based on introduction of new management sub-processes and FMT, it is advisable to go back to the step "Building a universal PMS" or revise the elements of the methodology of PMS development, and design the PMS according to the suggestions of the experts.

Nowadays, the new approaches to management are being developed. One of such approaches is the technologizing of management processes. At the present stage, it seems to be the most effective to use the management technology, which includes mathematical, logical, and sociological tools and techniques (Harrington, 1991). The need for technologizing is recognized gradually, when the organization is faced with the need to streamline its administrative and operational processes. Currently, there are practically no standard models to form and develop these activities.

The decision on technologizing the organization management processes may be caused by the need to define particular administrative tasks clearly, assign them to particular task owners, and standardize the procedures to fulfill them. Process technology ensures fulfilment of the requirement that the same type of procedures should by performed in the same way when fulfilling various FMT. It is also important, when selecting the range of means, to ensure fulfillment of FMT (Harrington, 1991). In addition, the FMT technologizing promotes interoperability of specialists within the organization.

The main focus of management decisions at the highest level is to define the basic objects of technologizing in the organization and to designate the persons, responsible for this area of the project activity.

Since the PMS reforming for OMS development is to be carried out at the level of FMT, the parameters of tasks are distributed according to standards. This is necessary in order to determine the number and qualifications of specialists in carrying out various activities in the area of management, in particular, standard time periods for accomplishing FMT.

The process of developing and implementing the standard time periods for accomplishing FMT includes calculation, discussion, revision and approval. This is a long process, but it can be shortened due to open publication of all materials, both the input data for the calculation and the standard time periods. The standards of prototypes or similar FMT used at the leading enterprises of the country can play an important role in this process (Kaufmann & Henry-Labordere, 1977).

The elaboration of tools of PMS development in the organization is achieved through implementation means, due to which the desired result is obtained. These means include the methods of performing procedures, management elements, managerial decision-making methods, and various types of support (informational, legal, technical, personnel).

After the introduction of new PMS elements, the actual operational results of the organization may not satisfy its management. In this case, the mechanism of PMS elaboration can be upgraded. This may be due to the omission of some procedures or their unsatisfactory performance (Kaufmann & Henry-Labordere, 1977).

5. Conclusion

Using process and functional approaches involves the possibility of inclusion of original elements or new technological operations, which should greatly enrich this work and introduce additional space for research and development. This may be found necessary when designing systems, processes, or parts thereof, and when designing some new operations which may become necessary in some process (Gerasimov, 2014).

The proposed models and techniques have been applied to the reform of a number of organizations.

The elaborated models and OMS development techniques based on reengineering allow structuring the elements of management processes, increase the responsibility for management tasks, and establish the rules for their performance, which ultimately increases the productivity and quality of the activities of managers. This allows us to recommend applying the mentioned methods and techniques to a wide range of economic systems, especially the large organizations, using a large variety of management functions of its activities.

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Innovation as a Vector of Regional Economic Development and a Necessary Condition for the Progress of the World Economy

Elena A. Yakovleva[1], Natalia A. Azarova[1] & Elena V. Titova[1]

[1] Voronezh State Academy of Forestry and Technologies, Voronezh, The Russian Federation

Correspondence: Elena A. Yakovleva, Voronezh State Academy of Forestry and Technologies, 8 Timiryazeva St. Voronezh, 394087, The Russian Federation. Tel: 79-10-346-8167. E-mail: elena-12-27@mail.ru

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Abstract

Innovative development is an essential component of economic development, responding to global challenges of our time. Please be aware that nowadays there is a great increase of not only the practical implementation of innovative technologies and processes, but also of theoretical understanding of these trends in theoretical studies. Exploring the nature of innovation processes and factors of their incentive economics focuses on the large-scale process of generating ideas and theories, issues of priority, issues of innovation, and economic and cultural backgrounds' need for innovative ideas. Innovation is the result of the transformation of ideas, research, development, new or improved scientific and technical, socio-economic, political and other decisions that promote, improve the quality and standards of living of the population and national security through the harmonization of the economic interests of economic entities (profit firms), market of consumer interests (needs at the lowest cost) and interests of society (rationalization needs, environmental protection, reduction of unemployment, the growth of the tax base, increase in average household incomes, reducing their differentiation, growth of intellectual potential of society, increase in life expectancy, increasing competitiveness of regions, countries and so on. Therefore, it is necessary to identify the role of innovation in the development of regional and global economy, which this study is dedicated to.

Keywords: economic development, innovation, progress, regional economy, world economy

1. Introduction

The last third of the 20th century was characterized by turbulent events in the life of human society. Tectonic shifts in the economic, political, and social structures periodically explode established order of things, cause rapid, unpredictable course of events. And perhaps the most dramatic events unfold exactly in the economic sphere. At the heart of these movements is the scientific and technical progress, and the pace is more accelerated.

Society has changed beyond recognition the appearance of new generation of tools and objects of labor, vehicles, and communications equipment. New forms of work organization and management completely changed the look and the very concept of enterprise, industry, productive and unproductive labor. Social structures and institutions underwent significant restructuring and renewal: the ratio of property, regulatory mechanisms of production and distribution of national wealth. There is a new type of labor, both individual and collective.

For nearly a century, the capitalist world at least twice made the transition to a new type of reproduction. In place of line production on the basis of rigid automation there came highly efficient, flexible production, calculated to produce a high quality product for individualized demand. One of the basic conditions for economic development was the growth of competitiveness and ensuring the leading position of domestic industry in international markets of high technology (high-tech) products.

2. Materials and Methods

The object of this study is innovations and their role in the development of regional economy, and the progress of the world economy. In economics, there are two types of growth: extensive and intensive. Economic growth due to an increase in the amount of resources simply by adding factors is the extensive type of economic growth. Economic growth, associated with the improvement of the quality of resources, using the achievements of scientific and technological progress, is an intensive type of growth. Accordingly, two types of growth are two groups of factors:

1) Factors that affect the amount of resources: labor, land, capital, entrepreneurial skills. These factors do not affect the qualification of workers and their productivity, quality equipment and technology does not change;

2) Factors that affect the quality of the resource. Factors of intensive type of economic growth are: increase in the qualifications and skills of the labor force; the use of more sophisticated equipment; the most advanced technologies (primarily resource); scientific organization of labor; the most effective methods of state regulation of the economy.

The main characteristic of the quality of economic resources is their performance. Labor productivity is the number of goods and services produced per hour of working time. Labor productivity and, consequently, economic growth and its rate are influenced by the following factors (Popkova &Tinyakova, 2013b):

• Physical capital (or equity) is stock of equipment, buildings, and structures that are used to produce goods and services. Note that physical capital is itself a result of the manufacturing process;

• Human capital is knowledge and work skills that get workers in training and workplace. Note that human capital, like physical capital, is also the result of industrial processes and also improves the company's ability to produce new products and services;

• Natural resources are factors provided by nature, such as land, rivers, and minerals;

• Technological knowledge is understanding the best ways (methods) of goods and services. Unlike technological knowledge of human capital, technological knowledge is itself the development and understanding of best practices (answer the question of how to produce), and, under the Human Capital, understanding the degree of mastery of people (labor) of these methods, transformation of knowledge into work skills.

The latter is closely related to the term "innovation". Innovation is driven in to the stage of commercial use and supply in the market as a new product. Genuine product novelty is always associated with an increase in economic benefits from its use.

It is now becoming clear that not physical, but human capital is the driving force of economic growth. Creating new ideas is the cutting edge of the economy. Science is always profitable. In the US, for $1 invested in research, there is an average of $7 profit. Economic advantage of the innovations is that benefits exceed the costs of the introduction of its creation. In addition, through innovation the productivity increases several times.

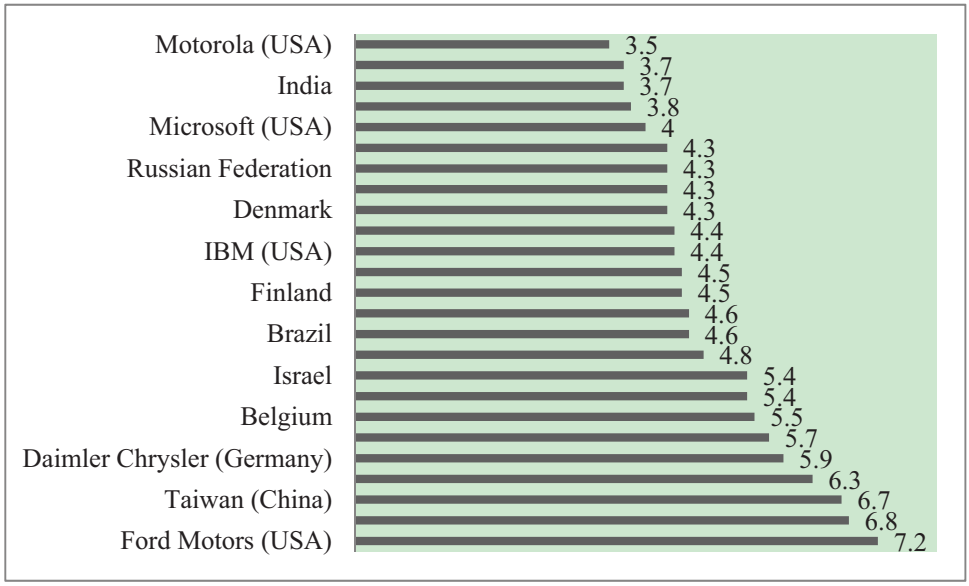

Figure 1. R&D costs of individual countries and TNCs (2013, billion dollars) (Asheim et al., 2013)

The developed capitalist countries have gained considerable experience in the organization of the innovational processes. There is a significant gap between science and economy. One reason for this is the virtual absence of new technologies, developed by scientists and engineers for the production of new products and reduction of production costs.

Most of our research industry cannot compete with the West. If the government does not take action, in a few years we will be completely dependent on foreign technology, created through the development and application of new technological knowledge. The question is whether we need to develop domestic production, spend financial resources on the development of the scientific base, if it is possible to import foreign technology? The answer is simple - it is necessary. Firstly, it is jobs and, as a result, decrease of the number of the unemployed. Secondly, the pre-reduction application of scientific developments in production makes scientific branch unclaimed, and consequently, uneconomical. Thirdly, new technologies make the work more efficient and allow increasing the production of goods and services.

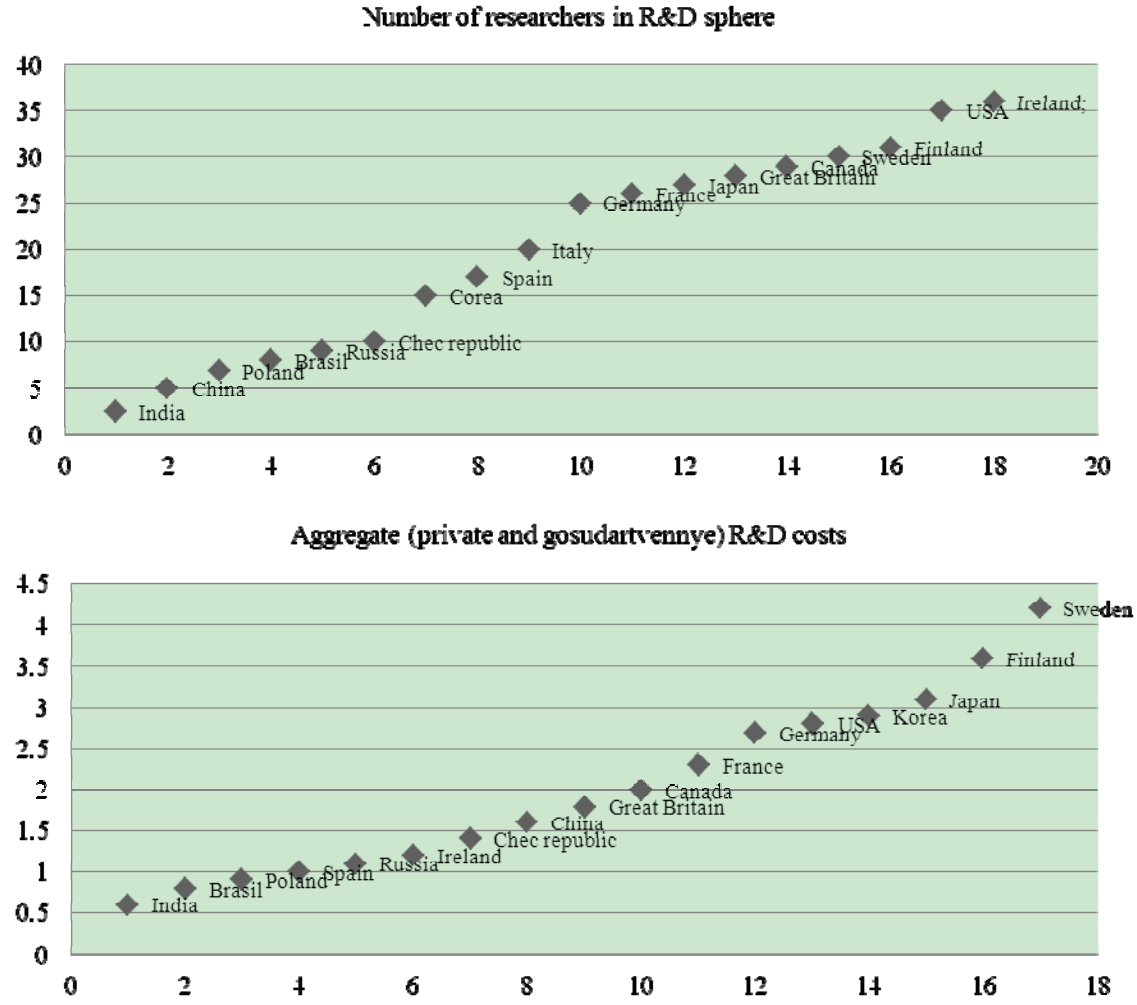

Figure 2. Number of scientists and engineers engaged to R&D and total R&D expenditures (different countries, 2013) (Breschi et al., 2014)

In its turn, the technological knowledge is extremely important, because it allow us solving the problem of limited resources. It is very relevant today, since minerals are non-renewable resources, and further production on such a scale, that is currently taking place, will soon lead to their total exhaustion!

Creation of highly innovative technologies and their application in industry have become a driving force of economic growth in most countries. Thus, the competition between countries is competition in the field of scientific knowledge and implementation of this knowledge in the industry (Fritsch & Slavtchev, 2011).

In today's global economy, innovation really becomes the leading productive force, the main instrument of competition in determining economic growth, and the dynamics of the relative economic power of states. Only the most backward of the underdeveloped countries continue to hope mainly on natural resources and low cost of labor. And Russia, unfortunately, goes on the same way, despite the fact that at its disposal is still one of the

largest in the world armies of scientists and engineers, comparable only with the "armies" of the two leading scientific and technological powers - the United States and Japan, with rapidly progressing China.

Table 1. Total government expenses in different countries (in % of GDP) in 2013 (Hajek et al., 2013)

Country	Public health	Education
Russia	2.2	3.8
Australia	6.1	5.2
Austria	6.6	5.6
Germany	6.4	4.2
Netherlands	4.4	5
Denmark	5.8	8.8
Sweden	7.7	7.7
Italy	5.9	4.9
Belgium	6.6	8.1
Bulgaria	4.6	4.2
Czech Republic	6.5	4.4
Hungary	4.8	6.1
Kazakhstan	2	3.3
Latvia	3.5	6.7
Lithuania	4	6.3

The relative size of the "bubbles" in the upper graph in Figure 2 represents the ratio of the absolute number of researchers in R&D on the ground is the absolute value of R&D costs. When it comes to the innovation process, there's a question of its main media on economic entities that perform the actual upgrade production. The peculiarity of the economic development of the capitalist economy in recent years has brought to the forefront of scientific and technical progress the small capital of individual initiators. Some researchers point to the fact that in the last decade half of all innovations in the industry in the USA were provided by small businesses, companies, and laboratories. Large corporations (often transnational activity) are by far the main carriers of the innovation process in the part where it is associated with the development of innovations, turning it into a mass product, or applied in mass production technology.

3. Results

Currently, innovative development is receiving increasing attention at all levels of government, municipal, and corporate management. This is no accident. According to the results of world practice, up to 30% of GDP growth (some sources say the figure is indicated in the range of 70-80%) is provided scientific and technical development.

Economic theory identifies different types of national economic systems, depending on the criterion of their selection (agricultural, industrial, post-industrial or traditional system, administrative-command, mixed economy, etc.). Local economic system is a special type of system, since its separation occurs within the national economy. The basis of this separation are: the possibility of territorial isolation of local societies; opportunity for relative isolation and institutionalizing the goals of socio-economic development of local communities; separation of the reproduction process of the local community, based on a wide range of material needs that serve the needs of the community, but do not affect the national interest; presence and isolation of collective interest as one of the most effective tools which meet the needs of people living together (Lemag, 2013).

Isolation of the local economic system, as an independent one, and a description of its main characteristics are possible due to the presence, along with public, of private group of municipal property as a special kind of property. Municipal property, in its turn, as a special kind of property, forms the economic foundation on the basis of which a special type of economic systems - local economic systems – are formed.

Local economic system is a complex concept which is a unity of its own economic and organizational-management relations, manifested in the special nature of their reproduction. Thus, the local economic system is a set of economic relations over joint ownership, use and disposal of the means of production by the population living on separate territory, which finds its direct expression in self-management and collective appropriation of the revenue in order to ensure the functioning and development of the local community and its residents and socially important services.

Today the activation of innovation is important as a whole and for each of its regions. The innovative character of regional development is manifested primarily in the expansion of the list of subjects of social and economic development of the region, formation of new sources and mechanisms of development, changes in the functions and tasks of territorial administration, and criteria for assessing the socio-economic efficiency of transformation and change. Regionalization of the national economy, as a manifestation of the decentralization of the economy, power and control, is a socio-economic innovation, implemented at the state level. On the "surface" of the process is the institutionalization of regional reproductive systems, partial "closure" of regional economies and the enhancing effect on the production of complex regional factors become competitive relations both horizontally and vertically.

The processes of globalization, increased competition, and dominance of innovative development - these are external factors that require modernization of the management of regional development, giving it a systematic and innovative nature. Comprehensive and systematic approaches for solving these problems form the basis for the introduction of innovative technologies in the practice of social and economic development of the region (Magro & Wilson, 2013).

Thus, the increase of the number and variety of subjects, determined by the vector and the pace of development, is a fundamentally new factor in the life of the regions. Among the main actors are the local organs of state power, bodies of local self-government in the face of diverse social organizations and business structures. It should be noted that in most parts of the production, two-thirds of the goods and services are provided by the private sector of the economy, and there is no direct influence levers of power in the activity of economic entities.

It should be noted that the establishment of the institute of strategic planning and implementation of the methodology of strategic planning and programming in the regional management practices should not only concentrate resources on priority issues and development programs, but facilitate their effective use, integrating all the components of a common goal of social and policy regional economic development: industrial, technological, innovation, investment, social and employment policy.

Strategic development plan of the region becomes a tool that will help focus the interests and efforts of all actors of life in the region on the main goal - achieving European standards of living standards of the population. At the same time, it should increase transparency (transparency) activities of the participants of regional development, reduce the risks of economic activities and reduce its informal sector. The importance of this institution as one of the elements of the investment climate of the state and its regions is emphasized repeatedly. However, despite the worsening of attention to strategic planning and programming, many large projects, as a rule, are declarative in nature and are not connected in terms of performance or content. However, they are under-resourced, which ultimately leads to inefficient use of embedded intellectual and financial resources and unsatisfactory pace of socio-economic transformation.

4. Discussion

Innovative transformation of the economy can be oriented in three main stages. The first stage (preparatory) should be based on the creation of the institutional environment of the innovation economy, modernization of education and health, and launching development projects in high-tech and infrastructure sectors. It is characterized by the following features of socio-economic nature: reducing labor supply due to declining population of working age; strengthening the negative impact of restrictions imposed by the production infrastructure; increased competition in domestic markets; instability of the ruble due to lower net exports.

Main priorities of socio-economic transformation at this stage include: establishment of a regulatory framework and regulators of innovative activity of corporations; structural modernization of education, health and housing and communal services, affordable housing for employees in innovation-driven industries; reform and modernization of basic and applied science, creation of an effective innovation infrastructure; modernization of high-tech industries, creation of new technological groundwork; maintaining macroeconomic equilibrium, ensuring stable ruble exchange rate and keeping inflation at the level of 7-10% per year by the end of the period; deployment of large-scale projects to modernize transport and energy infrastructure (Popkova & Tinyakova, 2013a).

The second stage (main) should be associated with the transition of the economy to the new technological platform, based on the promising developments in the field of information and communication, biotechnology and nanotechnology. Terms of socio-economic transformation in the second stage are characterized by the following: creation of strong research base; outstripping growth of investments in education and health and a significant increase in their efficiency; completion of large-scale projects in the energy sector; increase of the

competitive potential of transport; extension of the competitive potential of the agricultural sector, transfer of agriculture in a sustainable mode of development with a growth rate of not less than 5-6% per year; growing tension in the pension system, coupled with increasing demographic burden on the working population.

Main priorities of socio-economic transformation in the second stage include: creation of conditions for intensive technological renovation of corporations, based on new technologies; expansion of the position of companies in the world markets of high-tech goods and services; consolidation of specialization and competence in the high-tech markets; ensuring rational specialization of science, expansion of the advanced positions of science in the priority areas of research; creation of a network of competitive centers of higher education; integration into the world economy through the implementation of major energy and transport projects; increase of exports of transport services, information and communication services (Popkova et al., 2013).

The third stage (control) is intended to provide consolidation leading position in world economic system and innovation economy of the development mode. Its terms of socio-economic transformation must ensure the well-being of the population at the level of developed countries; deep integration into the international division of labor and production processes.

Priorities of socio-economic transformation in the framework of the innovative course should be the following: accelerated development of human capital, ensuring a leading position in terms of education and healthcare; development of cleaner production; formation of efficient economic associations in the Eurasian economic space with the participation and leadership role of access to stable demographic indicators; introduction of new forms of governance, adapted to enhance the role of global corporations and regions; creating conditions for sustainable and balanced development of the sector research and development.

Innovative modernization of the economy should be based on practical completion and implementation of a number of well-known since the end of the twentieth century domestic and foreign technologies. Actualization of the role of innovation in the process of transformation of the economy includes a wide range of conditions, instruments, and institutions:

• State support to innovation through the system of national priorities, strengthening the legal framework, and development of indicators for the future in the context of global trends;

• Dynamics of investment, directed by the state and big business, in priority sectors to support innovative transformation of the economy;

• Capacity building of competitiveness of domestic production through the mechanism of functioning of fundamental research projects;

• Implementation of promising innovative programs by consolidating the efforts of the government, science, and big business;

• Fundraising medium and large businesses to finance research, development, and innovation of new technologies;

• Intensifying efforts to form an innovative environment and conditions for the transition to business technology, ensuring high competitiveness and profitability of domestic business;

• Development of scientific forecasts of technological development in mid-term and long-term while conducting scientific expertise and innovative diagnostics of these forecasts;

• Finally, the active participation of the business community and science in training and retraining of staff capacity for timely innovative transformation of the economy.

Transition of the economy on the path of innovative development involves the implementation of a sufficiently strong research capacity and further strengthening of the institutional framework of the economy.

5. Conclusion

Innovative development of the region is a complex systemic problem that goes beyond the purely industrial innovation and politics, which leads to the following conclusions: socialization of the economy, investment, and labor relations have become the leading way to increase social and economic potential of the region; a necessary condition for the development of effective long-term regional development strategy is the balanced development of industrial, scientific, technical, and educational potential of the territory; strategic objective of regional investment policy should consist in creating conditions for increasing investment in human capital; formation of the regional market of innovative technologies and other infrastructure, ensuring the processes of commercialization of intellectual property, is a key social and economic issue; effectiveness of the system of

regional governance should be evaluated, oriented, and conducted with institutional reforms that promote the growth of total regional capacity; it is essential to ensure the integrity and stability of the system and to support organizational initiatives of regional governments economic mechanisms that allow consolidating the interests and directing the activity of all subjects of economic actions in the region.

Thus, summing up the results of research, it should be noted that the study of innovation in the development of local economies is an urgent task of modern economic theory; it reflects the interest of the scientific community to a set of economic relations on joint ownership, use, and disposal of the means of production by the population, living on the isolated territory. It is important to bear in mind that this concept finds its expression in the development of self-government, including the positioning of life itself and the local community, providing its residents with socially important services. Therefore, innovation is a vector of regional economic development and a necessary condition for the progress of the world economy.

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The Innovative and Technological Developments Acceleration of Russia (The Modern Stage)

Elena Sibirskaya[1], Oksana Khokhlova[1], Ludmila Oveshnikova[1] & Olesya Stroeva[2]

[1] Plekhanov Russian University of Economics, Moscow, Russian Federation

[2] Russian Presidential Academy of National Economy and Public Administration, Moscow, Russian Federation

Correspondence: Elena Sibirskaya, Plekhanov Russian University of Economics, Moscow, The Russian Federation, 36, Stremyannoy per., Moscow, 117997. Russian Federation. Tel: 79-10-269-0035. E-mail: e-sibirskaya@rambler.ru

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Abstract

We have undertaken the present investigation in order to offer the main directions of Russian economy reforming by dint of the acceleration innovative and technological development. Basing on these researches, authors allocate a number of the directions of innovative break, the country economic modernization. Today we have to use the public energy and national take-off for development of the country, the economy updating, and the quality improvement of the spheres, which are extremely important for each citizen. On the one hand, an activation of innovative activity demands the public administration and coordination of all its subjects actions, on the other hand, it demands an integration of all interested structures in the realization of innovations, the attraction of investments, the creation of the conditions which promote the innovative process and introduction of achievements of science and technology in national economy. The acceleration of national economy transition on the innovative way of development is impossible without formation the competitive national innovative system on a global scale. For its creation it is necessary to increase the demand for innovations from the most part of economy branches, to increase the efficiency of knowledge generation sector (fundamental and applied science), to overcome a fragmentariness of the created innovative infrastructure. This research can serve as a tool for innovative and technological development in the process of developing the recommendations about improvement of the state innovative policy and further development of national innovative system of the Russian Federation.

Keywords: innovative and technological development, acceleration, modernization of the country

1. Introduction

Russian Federation has the huge territory, enormous natural resources, the massive industrial potential, the right achievements great list in the field of science, education, art; the army and fleet history, the nuclear weapon, the governmental authorities, which play considerable, and sometimes the defining role in events of historical scale. President of the Russian Federation V. V. Putin and Prime Minister D. A. Medvedev (Putin, 2014; Medvedev, 2009) issue instructions to solve the economy modernizations strategic missions of the country on the basis of innovative development, the state efficiency, the improvement of life quality and competitiveness.

As the economic crises and economic sanctions showed that the economic development by means of materials sector is the deadlock, non-perspective direction. From infinite appeals to modernization of economy, it is time to go to act. It is useful to remind still S. Yu. Witte, the famous political leader, wrote about Russia, "the foreign trade develops mainly by the means of the raw materials resources sale which isn't profitable and is affected by spontaneous influences of the changeable conditions. Under such circumstances the welfare of the population can be neither high, nor steady" (Witte, 1914).

Russia keeps macroeconomic stability and pursues the delicate balanced budgetary policy. The basic indicators of the gold and foreign exchange reserves and the balance of payments remain at the highish plateau. The much attention is paid to formation of the favorable business terrain, the introduction of the best models on work with investors at the global, regional and local levels. In comparison with 2010, our country improved the positions twice in a well-known rating of Doing Business (APEC, 2014). For investors' involvement, derisking,

co-financing of projects and other our country plans to use institutes of development. There is an improvement process of access to credit resources. In addition, the mechanism development of a project financing comes to the end.

In our opinion, in the Russian conditions, there are two vectors of innovative development which are directed, first, on acceleration (consolidation of innovations role at a technologies exchange, the global competition, etc.) and, secondly, on innovations complication (the synergy of innovative business, an attraction of knowledge from outside). Due to occurring and the developed economic tendencies in the world, Russia needs an economic growth and maintenance of its competitiveness through continuous and innovative changes, and coordination of two vectors of innovative development. It follows from this that the Government of the Russian Federation has to find reserves for improvement of economic indicators from the inside. The basis of the state is made by its federal centers (regions); therefore, the economic growth will occur at the expense of reserves and potential powers of these subjects. Therefore, the Government has to develop a complex of theoretical principles and practical recommendations about formation of the innovative development variable content.

The development of basic innovations (technological) which will create the mechanism of concrete actions and will provide sustainable economic development of the country has to be a strategic role of the state policy. In this case the mechanism of investments and innovations interaction at all levels of managing, through available the state potential and means will be feature of basic innovations development and will lead to innovative development of the country. All world science considers the innovative activity as the main part of national economy modernization. Now the producing sector is already at the end of resources. Therefore, without introduction of the innovative activity, which is based on the employment of new technologies, it is not possible to survive and be competitive to Russian and other organizations (Shade, 1998; Massey & Quihtas, 1992; Boudeville, 1966; Stoneman, 1995; Cooper, 1985).

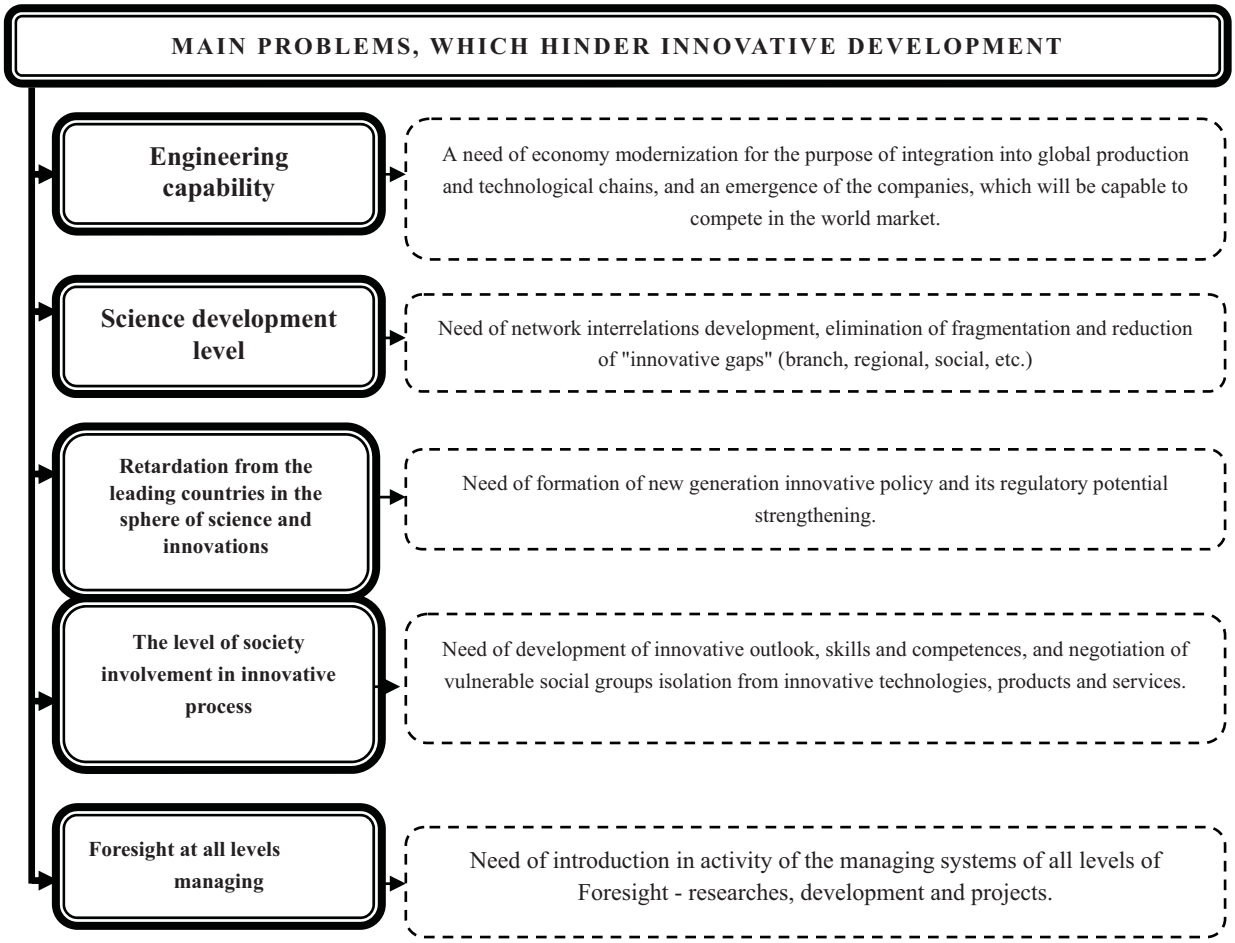


Figure 1. The main problems, which hinder innovative development

Undoubtedly, the continuous introduction and use of innovative activity allows keeping considerable rates of development and level of profitability (Sibirskaya & Stroeva, 2011). After all of these, it is very difficult to maintain high profitability in modern conditions and only the innovative activity use allows to keep and win leader positions during the long period, and to receive high rates of profitability. However, in spite of this it is necessary to study the opportunities and abilities of innovative activity (Sibirskaya, Stroeva, Gubareva, & Mikheykina, 2014).

For the achievement of abovementioned directions and transition to an innovative way of development at the state level, it is necessary to accept uniform methodical and methodological approach. The acceptance of uniform approach to innovative development will allow to solve a number of problems, such as separation of opinions on innovations terminology, the invalidity of formal indicators of an innovative activity assessment, also forced copying of foreign experience of innovations development.

According to authors' opinions, there are a number of the main problems, which hinder innovative development. These problems are demonstrated in Figure 1.

Nowadays in Russia, it is important to create the system of the innovative development modern instruments, which go with the best international practice, and to create the conditions for their application. The sets of the regulators used during every period, especially at the initial stage, can to be differentiated. It is expected that the main problems solution which constrain the innovative development will promote the transition to more advanced innovative modes (from imitation and borrowing to creation of products and technologies which will be competitive in the Russian and global market), to development of innovative moods in society, innovative skills and competences of employees.

Thus, the speed-up of innovative and technological development of Russia assumes refocusing of specialization and diversification of innovative potential due to the forced accumulation of new resource base in the form of scientific and technical activity products, the knowledge-intensive products and services.

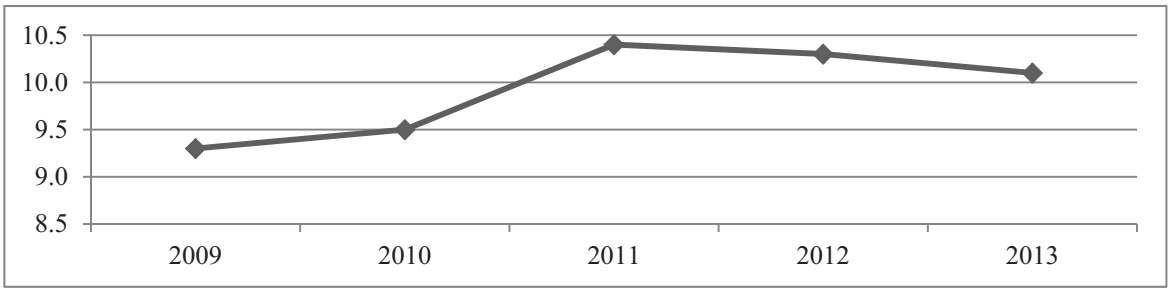
2. Describing the Domain

Within the next decades, Russia has to become the country in which the welfare will be provided the intellectual resources: the "clever" economy, which will create unique knowledge; the export of the latest technologies and products of innovative activity. Due to this postulate, the research instrument, which will allow opening the topical area of research, was defined. The complex and structural-logical approaches appear for a methodical basis. For the solution of performance targets the authors used the following methods of research: the theoretical: the analysis and systematization of monographic and periodic literature; specification and generalization; the analysis of the program and standard documents providing the innovative development of the Russian Federation; the empirical: learning of experience of national economy innovative activity; methods of information collection (supervision, expert assessment); the statistical: statistical analysis and substantial interpretation of research results. Use of productive results of this research gives the chance: to draw the moral from others mistakes without repeating them; to look for new ways of innovative development, working in uniform with the international community methodological space; to make use in Russia of experience of many countries on construction of innovative development institutes; to carry out the international comparisons and foresight researches; to reveal the narrow spaces and competitive advantages in the innovative sphere of the country.

3. Methods and Materials

The world community experience showed that the states could reach economic and social development only on the innovative way. It is enough to note that the economically developed states of the "G-7" are the leading countries in the scientific and technical relation. In addition, the success of the Asian countries, which followed a way of innovative development, impresses our scientists. Therefore, the choice of innovative approach as the basic in economic development of Russia is reasonable (Mesyats, Aldoshin, Buznik, & Ivanov, 2005).

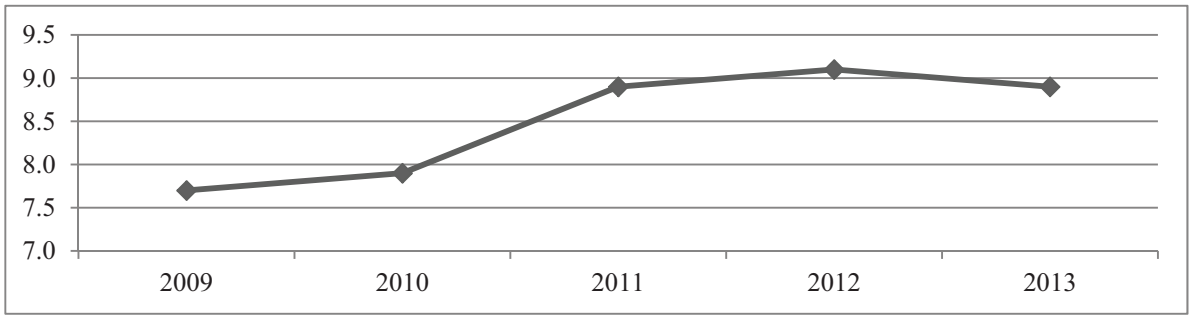
We analyze an innovative activity current state of the Russian Federation for 2009-2013 years according to Federal State Statistics Service data (Federal State Statistics Service, 2014).



Note. The innovative activity of organizations (the specific weight of the organizations, which realize the technological, organizational, marketing innovations)

Figure 2. Innovative activity of the organizations of Russian Federation for 2009 -2013 years

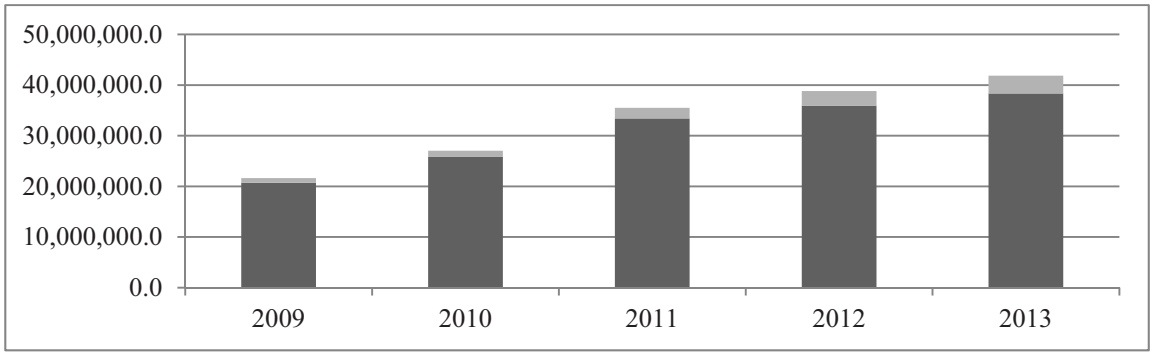
The innovative activity of the organizations remains at very low level now, though it has positive dynamics. From 2009 to 2011 the rising trend is observed (from 9,3% to 10,4%), since 2011 a slight decline of the specific weight of the organizations which realize the technological, organizational, marketing innovations takes place in comparison with the total number of the examines organizations.



Note. The specific weight of the organizations which realize the technological innovations in comparison with the total number of the examines organizations).

Figure 3. The specific weight of the organizations of the Russian Federation, which realize the technological innovations for 2009 - 2013 years

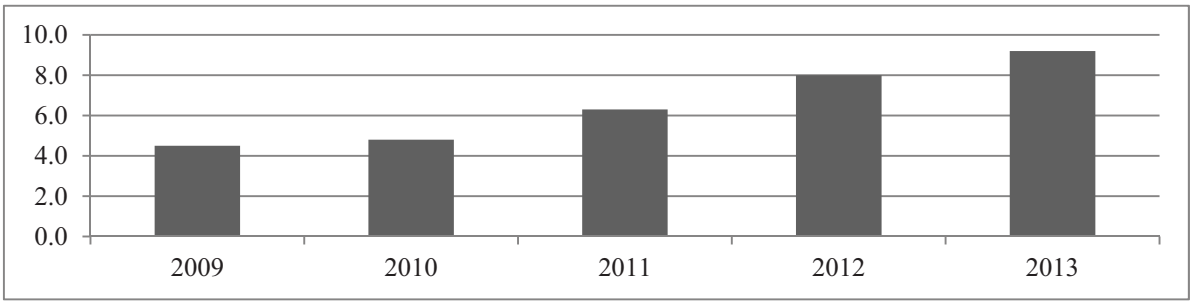
The quantity of the organizations, which realize the technological innovations, grows considerably smaller pace than innovations costs (from 7,7 % to 8,9 %). It testifies to inefficient investment. Besides, it speaks that money is invested in already existing organizations, without stimulating creation of the new enterprises.



Note. - including innovative goods, works, services; - the quantity of the shipped goods of own production and it is executed works and services with own forces)

Figure 4. The technological innovations cost in the Russian Federation for 2009 - 2013 years

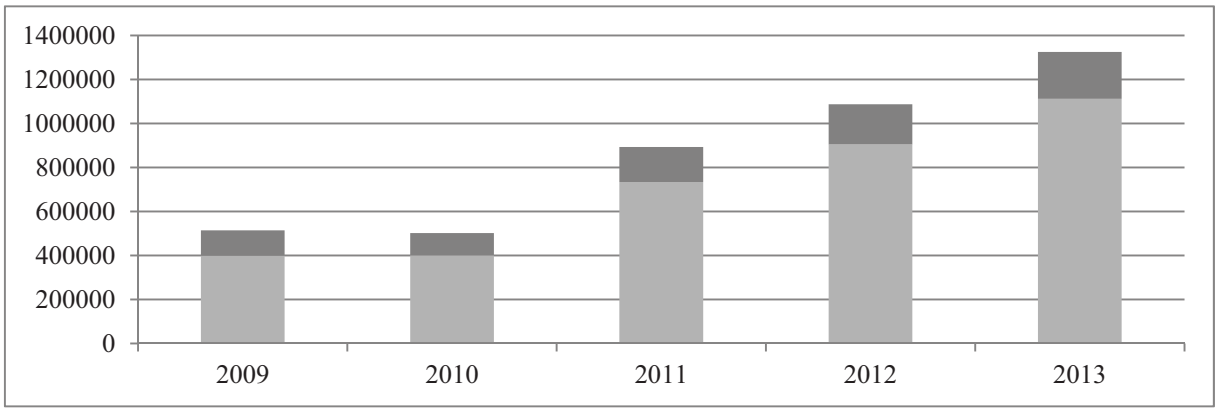
During this period the intensity of technological innovations costs (the specific weight of technological innovations costs in the total amount of the ship goods and the executed services) increases in the actual prices from 399122, 0 million rubles in 2009 to 1 112 429, 2 million rubles in 2013.



Note. The specific weight of technological innovations costs in the total amount of the ship goods and the executed services.

Figure 5. The specific weight of technological innovations costs in the total amount of the ship goods and the executed services for 2009 -2013 years

Nowadays only 8-10% of innovative ideas and projects is on average used in Russia, whereas in the USA - 62%, and in Japan - 95%. Thus the share of the Russian Federation in world trade by civil science-intensive products makes only 0, 3% that is about 100 times less than shares of the USA and Japan (Science. Innovations. Information society: the statistical book, 2013).



Note. - in real terms 2000; - in the actual operating prices.

Figure 6. The technological innovations cost in the Russian Federation for 2009 - 2013 years

The important difference of the innovative developing economies is that the greatest specific weight of expenses accrues to the researches and developments that are realized by own forces and the smallest weight accrues to the acquisition of already ready innovative solutions. In comparison with 2009 the positive tendency is observed in Russia: the costs share of the researches and development which are realized by own forces is increased from 9, 5% to 16, 8%, however the considerable part goes for machinery, the equipment and software acquisition, more than a quarter of all expenses are regarded to others which aren't classified in any way and it occupies less than 1% in the innovative focused economies. In general, the technological innovations costs in actually operating prices have the rising trend over the last 5 years.

Thus, the main problems of innovative activity development reduce to slow and inconsistent development of legislative base, a fragmentariness of the main units of innovative infrastructure; the inadequacy of the Russian workers skills to innovative economy conditions, etc. For the solution of the legislative, organizational and institutional problems it is necessary: to eliminate the discrepancies in legislative base by means of adoption of

the laws regulating innovative activity and also to correct the already existing; to investigate and systematize foreign experience of national innovative systems formation and development. The special attention should be given to the experience of such countries as Great Britain, Germany, China, Finland, Switzerland, Sweden, the USA, Japan, Canada because the listed countries take the leading positions in the international innovative ratings; to support and expand the practice of realization such actions, as the Summit of innovative economy creators, the Forum of innovative technologies, the international research and practice conferences on the innovative subject, the Competition of the Russian innovations, etc.; to support and develop crowd sourcing initiatives and to create mass innovative communities; to develop the innovative projects foresight (Oslo Administration, 2006).

As a result, it is possible to characterize the strengths of the country in the field of innovative and technological development:

– the fixed socially - economic growth as a condition of resource's provision of the innovative processes;

– the activation of the creative activity and improvement of the confidential environment in the innovative sphere;

– the full support of innovative business;

– the effective instruments complex of the innovative activity state support;

– the developing innovative infrastructure allowing to accompany the innovative projects from the earliest stages and with various branch orientation;

– the existing resources of the venture capital, the existence of the venture structures variety allowing to diversify the investment portfolios and to reduce innovative risks;

– the system personnel policy and the best practices use, the creation of an innovative activity information field.

4. Results

The strategic goal is the achievement of the economic and social development level corresponding to the Russian Federation status as the leading world power of the XXI century which is taking the advanced positions in the global economic competition and which ensures the national security and realization of the citizens' constitutional rights. For the period from 2015 until 2020, Russia has to enter the five of the leading countries on the GDP volume (The national economy, 2013).

The achievement of this goal means the formation of qualitatively new image of future Russia by the end of the next decade. The Russian economy not only remains the world leader in the energy sector, raw material digging and processing, but also will create the competitive economy of knowledge and high technologies. By 2020 Russia can take a significant place (5 - 10 percent) in the markets of hi-tech goods and intellectual services in 5 - 7 and more sectors. Moreover, the conditions for mass emergence of the new innovative companies in all sectors of economy, and first in the sphere of economy of knowledge will be created. The new territorial growth centers will be created as in areas of new raw material resources development, and in traditional regions of innovative, industrial and agrarian capacity concentration, besides the scales of a regional inequality will decrease. The comprehensive solution of the performance targets consists in the Russian economy transition from the export and raw development to the innovative socially oriented type. It will allow expanding the competitive potential of the Russian economy due to accumulation of its comparative advantages in the science, education and high technologies and on this basis to involve the new sources of economic growth and welfare increase.

The innovative economy formation means the transformation of intellect, creative potential of the person into the leading factor of economic growth and national competitiveness. A source of the high income is not only the possibility of the rent receiving from natural resources use, but also the production of new ideas, technologies and social innovations. It will allow to Russia to meet competition with low labor of China and India economies and with high quality and innovative production of the Europe, USA and Asia developed countries (The Concept, 2008).

Thus, we assume that by 2020 the qualitative and quantitative characteristics of the Russian economy in the connection with acceleration of innovative and technological development will change. Among them the modernization of the Russian economy traditional sectors; the forward-looking increase in production volume of advanced processing branches which through to 2020 remain the leading sectors of gross domestic product production; the transformation of innovations into the leading factor of economic growth; the share of the industrial enterprises which realize technological innovations has to increase to 40 - 50 percent; the innovative production share of release has to increase to 25 - 35 percent (Indicators of innovative activity, 2014).

5. Conclusion

This demonstrates that the innovative development is objective necessity for Russia. And we consider that in order to push the innovation and technological development of Russia it is necessary: to concentrate on the growth of the new economy sectors which meet the needs and values of new consumers generation, i.e. the sectors which provide so-called "the clever growth" (new power industry, the industry of health, the cognitive industry, a free access to the future world of education, high quality of life for all age groups, life in the network world based on identity and safety); the orienting point has to be made not on the basis of research and development, but on the basis of the new markets start; to form the clusters which have to provide the competitive presence in the new quickly growing markets; to realize the further improvement of support infrastructure of the innovative and technological growth; to parlay the new companies and institutes. Thus, nowadays the increase questions of technological modernization efficiency and acceleration of Russian economy innovative development are one of the priorities of the state policy and are in the center of scientific discussion.

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Strategic Management of Coal Mining Industry Efficiency

Olga Tkacheva[1], Anna Batashova[1], Irina Zhukova[1], Anna Smakhtina[1] & Liudmila Topchienko[1]

[1] The Shakhty Branch of M.I. Platov South-Russia State Polytechnic University (NPI), Shakhty, Russian Federation

Correspondence: Anna Batashova, The Shakhty Branch of M.I. Platov South-Russia State Polytechnic University (NPI), Russian Federation. Tel: 79-18-508-5375. E-mail: rusbatashova@yandex.ru

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Abstract

The purpose of this study is to develop recommendations for the coal mining industry efficiency strategic management. The authors developed a mathematical economic models to maximize the net present value of the index of companies in the composition of the coal mining industry and calculated the efficiency of Russian enterprises in the composition of the coal mining industry in Russia in 2013 using MathCad. The authors identified the main problems of coal mines and in the quality of their solutions offer an innovative approach to strategic management of the industry of the country, which includes: establishing a common standard in the monitoring, analysis and evaluation of the situation, management decision-making at all levels of corporate and public governance; elimination of dogmatism in the organization of corporate and public governance, encouraging maximum independence and initiative of corporate management in the framework of national development strategies; Schooling management training to all levels of management autonomy, rapid, and therefore efficient and effective management within the company's strategy; creation of a unified and transparent system of monitoring of management decisions and increase the level of responsibility of managers at all levels and branches of government for the implementation of the national strategy, and within it is a strategy of smaller entities. The result of the joint implementation of the proposed principles in the organization of strategic management at different levels of management should be a combination of freedom in solving economic problems and personal initiative managers.

Keywords: coal mining industry, efficiency, “personal factor”, “strategic engagement”, strategic management

1. Introduction

The need for a permanent improvement of quality management of business processes that determine the structure and functional areas of modern production management defined by the increased requirements of the competitive environment, increased competition with multinational corporations in the domestic market, followed by the national adaptation techniques and tools of strategic management in Russian economic conditions, the increasing number of factors, adversely affecting the normal course of the reproduction process, the changing role and status of enterprises in the national economy and giving them the status of the main component of sustainable growth of competitiveness and welfare of the Russian nation.

The urgency of modernization of industrial management of the country has been repeatedly emphasized in the President of the Russian Federation Federal Assembly, the need for such modernization aimed at increasing the effectiveness of strategic management across the sectors and industries of the national economy has long recognized as a separate system of public administration sectors, industries and industrial complexes of the country and by the industry. Expanding the scope of strategic management, the introduction of new teaching and methodological approaches to the organization of production using the principles of strategy and complexity will increase the efficiency of target complex programs with significant economic value, provide high-quality production processes, review, implementation and monitoring of management decisions in terms of the complex regard to their relevance and possible consequences, ultimately is a positive impact on the final results of industrial enterprises by improving the accuracy and validity, and thus increase the positive and reduce the negative impacts of management decisions.

2. Materials and Method

Russia remains one of the world leaders in the production of coal. In its interior focused one-third of the world's coal resources (173 billion) and one fifth of proven reserves. Steam coal reserves account for about 80%. Industrial stocks of existing enterprises make up almost 19 billion. Tons, including coking coal - about 4 billion tons.

According to the draft, “General scheme of the power facilities up to 2020” provides for the growth of electricity consumption in Russia by 2015 to a level of 1.426 trillion. KWh (1600 kWh high variant). The increase in 1,4-1 6 times.

Provides for the modernization of the electricity sector, including through the replacement of obsolete generating equipment for new modern samples with an average efficiency of coal-fired power plants by 2020 at least 38%, and by 2030 - not less than 41%, which implies a need to increase production and improve competitiveness of coal mining enterprises.

The fundamental principles of measuring enterprise competitiveness are to assess the value of the business. Improving the competitiveness of coal enterprises in the current market environment requires proper management of the property complex. Effective management of the property complex of the coal industry should provide increasing their attractiveness.

Due to the fact that the company is the subject of the sale, mortgage, lease and other transactions, it is characterized by the properties of the goods for which the market can get different prices depending on the ratio of demand, supply and quality of the goods. When placing the goods on the market, the company owner is going to get the maximum price based on its qualitative characteristics, which are determined primarily by increasing or stable profit margin in the reporting period and the position of the company on the market. Stable or increasing the profit margin, in turn, depends on the size of the cost of products manufactured by the company.

One method of business valuation is the income approach. Business Valuation according to the income method is based on a calculation of the net present value as the sum of the discounted cash flows for all periods forecasting and capitalized cash flow post-forecast period.

Factors of economic growth of the company may include the following components: profits from production, investment and financial activities on by-individual enterprises; cash flow, due to the increase in sales of products; the rate of turnover of working capital; improving the competitiveness of enterprises. In this case, the company has the ability to control a long-term plan of development of individual businesses to maximize the value of the industry as a whole.

Coal mining industry needed radical modernization, investment demand for the entire life cycle of the enterprise, therefore seeks to encourage investment projects related to the technical re-equipment, reconstruction, maintenance capacity of the existing coal-mining organizations.

In the Guidelines for assessing the effectiveness of investment projects, one of the accepted notions of equal NPV – Net Present Value. In this regard, the investment attractiveness of the coal mining company can be characterized by the “net present value of the enterprise” (HTCP), determining the economic growth of the business. Therefore, one of the factors of effective property management is to improve the mining company HTCP.

Maximization of the net present value of the company (CHTTSP) may be provided on the basis of the developed economic and mathematical model that allows while maintaining the planned volume of production to carry out a partial or complete retooling of the company to increase its economic potential. Economic-mathematical model to maximize the net present value of the index of companies as part of the coal mining industry is as follows:

$$HTCP=\left\{\sum_{t=1}^{T}\left[\sum_{i=1}^{N} P_{it}-\sum_{t=1}^{N} C_{cpt} * g_{it}-H_{umt}\right]-n_p\left[\sum_{i=1}^{N} P_{it}-\sum_{i=1}^{N} C_{pt} * g_{it}-H_{umt}\right]+\sum_{i=1}^{N} A_{it}-\sum_{i=1}^{N} K_{it}\right\} * \frac{1}{(1+E)^t} \rightarrow max\,, \quad (1)$$

Where

$$C_{cpt}=C_{crb} * \mathcal{E}_i * \frac{a_i * \frac{x_{ib}}{x_{it}} * k^* + b_i}{\frac{x_{ib}}{x_{it}} * k^*} * u * x_{it}\,, \quad (2)$$

N is number of enterprises within the company, i € N;

Pit are sales volume i-th coal-mining enterprise in the t-th year;

Ccpt is the average cost per unit of output issue for the industry as a whole in the t-th year;

git, gib is volume of output i-th coal business in the t-th and the base year, respectively;

Humt is property tax;

Ait is amount of depreciation of i-coal business in the t-th year;

np is income tax rate;

Kit is the value of capital investments i-th coal business in the t-th year;

Ccrb is average cost per unit of output for the release of a whole industry in the base period;

Ɛi is the ratio of the cost of issuance per unit of output for individual enterprises in the base period to the average cost of production for the industry as a whole;

ai is the proportion of variable costs in the cost of the individual enterprise of the reference period;

bi is the proportion of fixed costs in the cost base period (a. and b. for all mines are taken constant in the period under review, equal to 0.5);

xib, xit are the share of output for individual enterprises in the total volume of output in the base and the t-th year, respectively;

k * is coefficient of variation in output for the whole company in the t-th year, which is calculated by the following formula:

$$k^* = \frac{\sum_{i=1}^{N} g_{it}}{\sum_{i=1}^{N} g_{ib}} \ , \tag{3}$$

where u is the growth rate of production costs, taking into account the inflation process (taken in the reporting period equal to 1.07);

T is calculated (considered) a period sufficient to partially or completely re enterprise companies.

Reduced economic and mathematical model can be used to estimate the value of the coal mining company that generates cash flow from operating activities of its constituent individual enterprises. The implementation of economic-mathematical model of formation of business value, taking into account growth factors allows for uniform development of all businesses within the company through the implementation of timely technical re-equipment, without compromising the overall efficiency of production in the industry as a whole.

The development strategy of complex organizational and production systems, including in the coal industry, must comply with the trajectory behavior of enterprises. Require rapid development and updating of the construction and reconstruction of enterprises, as well as projects change management and organizational structure of flexible geotechnical mining complexes and energy companies.

3. Results

Economic-mathematical model to maximize the net present value of the index of Russian companies in the composition of the coal mining industry in Russia in 2013, calculated using MathCad, is as follows:

$$\text{HTCP}=\left\{\sum_{t=1}^{T}\left[\sum_{i=1}^{228} P_{it} - \sum_{t=1}^{228} C_{cpt} * g_{it} - 2{,}2\right] - n_p\left[\sum_{i=1}^{228} P_{it} - \sum_{i=1}^{228} C_{pt} * g_{it} - 2{,}2\right] + \sum_{i=1}^{228} A_{it} - \sum_{i=1}^{228} K_{it}\right\} * \frac{1}{(1+1{,}25)^t} = 80591 \text{ million dollars.}$$

This is quite low compared other countries, given that the Russian coal industry has 228 enterprises. It is therefore necessary to improve strategic management of the branch efficiency Russian coal industry. Among the main problems of the development of coal mines are the following (Popkova, Tinyakova, 2013a):

1. Difficulties in attracting long-term investments for renew existing facilities and construction of new coal industry.

2. The high proportion of costs (30%) accounted for the construction of new facilities.

3. Insufficient supply of industrial workers and personnel during construction and subsequent operation of coal enterprises.

4. High level of deterioration of the equipment of enterprises.

5. Distance stores, the complexity of the transport chain in the sale of products.

6. Low wages, high part of it (30-40%) in the structure of production costs.

In recent years, the company's coal mining experience difficulties in meeting their obligations under the contract, shipment of coal to consumers because of an insufficient quantity of empty gondolas and services divisions of Open Joint Stock Company “Russian Railways”. In order to cover the growing needs of transportation of coal should be considered infrastructure and modernization of the fuel flows in the whole complex.

In 2013, 86 mines with a production capacity of 411,200,000. Tons, carried coal production of 354 million tons, an increase of 5% coal production compared with 2012. Coal preparation took place on 59 fabrics, and as a result the amount of enrichment was 139.4 million. Tons, increasing by 11% the volume of 2012. This increase in production is due to the fact that in 2013 were put into operation new production capacity and about coal-enrichment plant.

Proposed in this study approach to strategic management of the country's industry include: the establishment of a unified standard in the monitoring, analysis and evaluation of the situation, management decision-making at all levels of corporate and public governance; elimination of dogmatism in the organization of corporate and public governance, encouraging maximum independence and initiative of corporate management in the framework of national development strategies; Schooling management training to all levels of management autonomy, rapid, and therefore efficient and effective management within the company's strategy; creation of a unified and transparent system of monitoring of management decisions and increase the level of responsibility of managers at all levels and branches of government for the implementation of the national strategy, and within it is a strategy of smaller entities (Harpman et al., 2013).

The result of the joint implementation of the proposed principles in the organization of strategic management at different levels of management, should be a combination of freedom in solving economic problems and personal initiative managers. This combination is an absolute competitive advantage of strategic nature, since it increases the flexibility and effectiveness of implemented management decisions and reduces response time, take into account when implementing the strategy of “personal factor” of managers (their ability to identify and realize the hidden potential arising from the specifics of the situation and the prevailing difficult detected with other levels of government). In turn, the proposed strategic approach combines perfectly with competitive advantages in other areas, allowing you to implement a strategic plan and seize the strategic initiative (Popkova & Tinyakova, 2013b).

Based on the proposed approach, there is a possibility of practical use of the concept of strategic involvement, which considers the enterprise as domestic consumers of services of the state and determines the need to coordinate vectors of enterprises (branches) and the state;

Any action taken as part of the corporate strategy, carried out in conditions of uncertainty and risk, complicated by an independent, masked and difficult to detect policy competition. This situation becomes a constant and inexhaustible source of changes in economic conditions. Various organizational difficulties and resistance competitors further reinforce the uncertainty, reducing to zero forecast accuracy and enhancing the importance of the time factor in the implementation of corporate strategy (Popkova et al., 2013).

Our studies have shown that the head of every industrial enterprise has its own idea of the economic conditions, strategic opportunities and threats, intentions and activities of competitors. It is clear that the administrative decision of each parent's head, on the one hand, must clearly indicate the specific direction of corporate strategy, and on the other - take into account the constant updating of the situation and provide a lower level managers greatest possible freedom in the implementation of the strategy, which, when multiplied by the professionalism and give victory in each situation (Feather et al., 2011). Moreover, the administrative decision of any leader is already outdated at the time of its adoption, because there is a time lag between the identification of “strategic window” of his identity, the development of the program of action within the corporate strategy and its implementation. Corporate strategy adjustments borne by the heads of lower-level management and direct perpetrators and cannot and should not be performed by middle and senior managers. However, the leaders of these levels are responsible not only for the quantity and quality of management decisions, but also for system implementation strategy that includes initiatives of the lower levels of government to implement the strategic plan. In case of violation of the principle of corporate strategy loses its flexibility, it becomes dogmatic, massive and inefficient in a rapidly changing environment fiercely competitive business environment (Hawkins, 2012).

The practical application of this approach to the implementation of corporate strategy involves the following tasks:

1) establishment of a unified standard in the monitoring, analysis and evaluation of the situation, management decision-making at all levels of corporate and public governance;

2) elimination of dogmatism in the organization of corporate and public governance, encouraging maximum independence and initiative of corporate management in the framework of national development strategies;

3) adaptation of management personnel at all levels of management to independence, rapid, and therefore efficient and effective management within the company's strategy;

4) creation of a unified and transparent system of monitoring of management decisions and increase the level of responsibility of managers at all levels and branches of government for the implementation of the national strategy, and within it - a strategy of smaller entities.

The result of the joint implementation of the proposed principles in the organization of strategic management at different levels of management should be a combination of freedom in solving economic problems and personal initiative managers. This combination is an absolute competitive advantage of strategic nature, since it increases the flexibility and effectiveness of implemented management decisions and reduces response time, take into account when implementing the strategy of "personal factor" of managers (their ability to identify and realize the hidden potential arising from the specifics of the situation and the prevailing difficult detected with other levels of government). In turn, the proposed strategic approach combines perfectly with competitive advantages in other areas, allowing you to implement a strategic plan and seize the strategic initiative (Bergstrom, 2013).

In today's Russian reality becomes relevant "strategic engagement", the essence of which is to develop and effectively implement common to government and business objectives for the real welfare of the whole Russian nation. In this case, there is a need to implement the following management concept:

1) state, represented by the top leaders of the country, responsible for the formulation of national development goals and monitoring their achievement;

2) state, represented by the management structure of the industry of the country, combining its work in the direction of movement of national goals, freedom and initiative in making management decisions, comprehensive responsibility for the results of the industrial sector of the economy;

3) industry, combined with the state common understanding of the situation and development objectives, operating on the same strategic principles and implement corporate social responsibility in the form of job growth, income of their workers and their households, reducing the risk of expectations, increasing confidence in the future.

Current understanding of the strategic situation in relation to national development and industry in particular is completely contrary traditionally in the industrialized countries to the principles of organization management. Ministry of Industry and Energy of the Russian Federation does not have all the necessary powers for the organization of strategic management industry of the country, remaining nominal party and essentially formal observer with no real ability to manage development processes in the industry.

Today, there is a gap between the stated goals of the state (including the growth of national competitiveness) and features the country's industry due to lack of a unified management structure industry (today in the strategic management of industry involved to 89 organizations, each with its own goals and vector development). Representatives of the state actively use their powers for personal purposes that in the absence of a control system of strategic management at the root undermine all the initiatives of industrial enterprises in the area of development.

Industrial enterprises in these conditions have only true way to find a disguise and focus on their plight. To implement the strategic involvement of all active players interested in the development of national industry and achievement through the development of this national goals should coordinate vectors of development, but at this level of strategic involvement of industry in their bulk will be able to develop rapidly, and the state - through their development to solve its strategic goals (Crandall et al., 2012).

Implementation of the strategic involvement in the strategic management of the country's industry is available in the following logical sequence:

1. Organization of strategic management of the country's industry

1.1. Creating a structure of strategic management

1.2. Transfer of the strategic management structure appropriate authorization and implementation of activities on the principles of unity of command and responsibility

2. Organization of strategic engagement at the level of the state and enterprises using the methodology of staff involvement

2.1. Strategic involvement of civil servants

2.2. Strategic involvement of enterprises

Strategic involvement of employees of the state structure of industrial management and industrial enterprises should be implemented in accordance with the methodology includes the steps of understanding, enthusiasm, sales and retention.

The aim is to determine the stage of understanding the emotional and rational set of promises that could affect the behavior of staff, measures that can engage employees and change their behavior. Real actions at this stage strategic engagement may include: interviews with government and corporate management, leaders of spontaneous groups, workers; audit of state and corporate culture, communication channels, relations workers; collection of real stories from the inner life of the state and industry, management truthfully illustrate the situation (Fisher & Raucher, 2013).

The aim is to create excitement stage inspiring strategy and action plan, which in turn provides for the development of a hierarchical messages adapted to each level of the hierarchy, the development of a visual interpretation of complex concepts, creation stories and legends that illustrate the basic principles of state and corporate ethics (Randall et al., 2012).

The purpose of the implementation phase should be the conviction and consolidation of key audiences is government and corporate managers. This phase includes the following steps: focus groups, communication activities, campaigns for the development of inclusion (Scott et al., 2012).

The purpose of phase retention is diverting the strategic objectives to operational level, the achievement of fundamental changes in the imperative. By the action of this phase include the establishment of memos, guides and instructions, the nomination for the title of “best”, training to improve efficiency, the resulting measurements.

The essence of strategic engagement is reduced to the development and effective implementation of the uniform for the government and business targets for the real growth of the welfare of the whole Russian nation. In this case, there is a need to implement the following management concept: the state represented by the top leaders of the country, responsible for the formulation of national development goals and monitoring their achievement; state on behalf of the management structure of the industry of the country, acting on the basis of unity of command and combines his work in the direction of movement of national goals, freedom and initiative in making management decisions, comprehensive responsibility for the results of the industrial sector of the economy; industrial enterprises, combined with the state common understanding of the situation and development objectives, operating on the same strategic principles and implement corporate social responsibility in the form of job growth, income of their workers and their households, reducing the risk of expectations, increasing confidence in the future (Smith et al., 2011).

4. Discussion

Implementation of the strategic involvement in the strategic management of the country's industry is available in the following logical sequence: the organization of strategic management industry of the country (the creation of the structure of strategic management, strategic management structure of the transfer of appropriate powers and carry out activities on the principles of unity of command and responsibility); organization of strategic engagement at the state level and enterprises using the methodology of staff involvement (strategic involvement of civil servants, the strategic involvement of enterprises);

The strategic initiative is crucial, the key to strategic management. Strategic Initiative is a prolonged pressure (impact) to constant accumulation of all the great advantages in the development, building strategic position of competitive advantage - and their subsequent implementation in the transition to a pronounced offensive action in the process.

At the heart of the strategic initiative should be based on a strategic plan with the objective of drastic change in the situation, suitable for its initiator. In this conception may be, for example, the revolutionary changes in technology manufacturing, massive introduction of new materials, active development and the sudden introduction of new forms of non-price competition, the introduction on the background of basic solutions of new methods of management in the conditions of risk and uncertainty, etc. Strategic plan usually not on the

surface and requires a deep study of the situation permits increased risk, in most cases based on the use of heuristics and intuitive justification and decision making.

The strategic plan calls for multivariate calculations looking at a number of periods (moves) forward, with maximum regard for the element of surprise competitors sector or region, and operational impact on the evolving financial and economic situation. Strategic plan and strategic initiative is to bring effective strategic management only if the resources to ensure proper maneuverability and a sufficient number of strategic reserves for this purpose.

Strategic management, in our view, should, in the end, be reflected in the establishment for the purpose of targeted strategic guidance and target strategic guidelines.

Target strategic guidelines logical are to take the specific characteristics of the general goals and objectives of all other levels of economic entities at the national and regional stages of management.

In turn, the target can be considered strategic regulations quantitative digital assignments, the achievement of which is a phased approach to target strategic targets of economic development projects.

In this connection, put forward by the President of the Russian Federation, the national idea - the creation of a competitive economy in the country is possible, in accordance with the above, consider a classic example of targeted strategic guidelines, and they also put forward the goal of doubling in 10 years, the gross domestic product (GDP) of the sample target strategic norm.

Applying this approach to the organization of strategic management makes it possible to implement the concept of "strategic engagement", which considers the enterprise as domestic consumers of services of the state and determines the need to coordinate vectors of enterprises (branches) and the state.

5. Conclusion

At present, the development of coal mining industry cannot be done without the scientific, technical and innovation policy pillars of which are:

- Improving the technical equipment of coal production, including the use of high-performance enterprises of mining and transport equipment cyclic and continuous;

- The use of cyclic-flow and flow technology, the organization of aid in the further development of coal mining technology using mainly in long term mechanized complexes latest technical level, as well as innovative technology using continuous miners and self-propelled means of transportation and marketing of coal;

- The application of measures to improve the quality of coal products;

- Development and implementation of efficient technologies of coal preparation;

- The use of the latest technology of commercial production of coal mine methane;

- Improvement of technologies for industrial production of liquid products deep processing of coal;

- Development of new technologies and equipment for effective de-gassing coal seams.

In the near future in order to achieve long-term development of coal mining enterprises must carry out a number of priority actions:

1) To approve the legislative program licensing coal deposits for the period up to 2015;

2) Introduce legislative norms, which would provide for the formation of coal mines on a single integrated system for managing the security industry and the protection of workers;

3) Create a new version of the rules of safety in coal mines, with subsequent approval, and to improve safety standards and rules of industry, aimed at reaction adequate fire protection shafts, dust and gas regime, as well as willingness to mine accidents.

Also necessary is to improve the conditions of competition coal markets. And mostly what is supposed to pay attention is to prevent the negative impact of the price of local and regional coal monopoly and further unjustified growth in coal prices under the influence of price transformations in the field of gas. This is to ensure economic preferences coal consumption compared to the alternatives. Thus, we can conclude that the coal industry plays an important role in the economy of the country and has a great potential in coal mining.

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Prospective Mechanisms of Peripheral Areas Investment and Innovation Potential Formation

Tatiana V. Karpenko[1], Dina V. Zaloznaya[1], Tatiana V. Volodina[1], Lyudmila F. Belousova[1] & E. A. Breusova[1]

[1] Branch of the Southern Federal University in Novoshakhtinsk, Novoshakhtinsk, Russian Federation

Correspondence: Karpenko T. V., Branch of the Southern Federal University in Novoshakhtinsk, candidate of economic sciences, associate professor, the chair of "Management and economy", ap. 9, 5 Molodogwardeizev St. Novoshakhtinsk, 346909, Russian Federation. Tel: 79-03-431-9874. E-mail: karpenko_tv@mail.ru

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Abstract

In this study conducted a comprehensive study of investment and innovation processes in conjunction with the problems of balanced economic development mesa-level, modify the basic economic proportions and the speaker on the one hand, the factor, and the other - the result of a regional self-development and interregional cooperation, is of particular relevance is the backbone target benchmark regional social and economic policy. A very need innovation-oriented development of the regional investment potential of paramount importance for Russia as a whole, and for its regional components, the prospects of dynamic development which largely involve the presence of an effective, articulating the functional components and hierarchical levels, the mechanism of activation of innovation-oriented investment and support of innovative activity of economic entities. Last in the current economic realities becomes as important competitive advantage and sustainable operation of the main factors of economic and reproductive system of the region. The effectiveness of the efforts and actions towards the formation of a favorable investment environment and innovative qualities of the regional economy, which are understood as its ability to self-renew, change adaptation and generation of scientific and technological progress, sustainable development, production and maintenance of its competitiveness in the long term, depends not only on the available resource capabilities as the availability and effectiveness of regional investment mechanism regulating and coordinating the development of innovative sphere of the region.

Keywords: peripheral areas, prospective mechanisms, investment and innovation potential, region

1. Introduction

Differentiation of the innovation potential and the associated disparity focusing on the innovation investments can be traced both globally and on a national scale. Received the results of this evaluation confirm the fact that in a substantial regionalization of the national economy, meaning the absolute importance of regional determinants in the development of an innovation-oriented regional investment policy is necessary to develop mechanisms aimed at creating conditions to ensure effective and practical cooperation between scientific, technological and innovative sector with the sphere of production and other spheres of life.

The main reasons that cause the contradiction between having a sufficiently high investment and innovation potential of individual peripheral areas of the country and the results of their use of the conjugate are imperfect mechanism for commercialization of intellectual property; lack of legislative and legal framework of innovation and investment de yours elf; the low social status of a research scientist, entrepreneur, innovator; absence of significant incentives for innovation financing; often non-market management in science and technology, and poor knowledge of the majority of managers based on innovative economic development of the region; undeveloped incentives for banks to participate in financing innovation and insurance risks of investment and innovation; low level of information and advisory system for participants in the innovation process in the peripheral areas, and others. In other words, the lack of adequate modern realities of management methods and mechanisms of innovation-oriented investment activity in its geographically localized forms is one of the major reasons for the instability of innovation and economic development in general and persistent imbalances in the regions of Russia.

2. Subject

Subjects of the research are the prospective mechanisms of peripheral areas investment and innovation potential formation.

3. Materials and Methods

The emergence of an innovative economy has led to an explosive growth of disparities in terms of innovation-oriented investments between the different regions of the world economy, among the major subjects of the Russian Federation and the rest of the territory. Therefore, one of the most important problems of scientific and inventive and innovative activity, scientists believe its uneven distribution of the leading countries and territorial disparities within countries. High-income countries, which are home to 15.6% of the population is concentrated at the overwhelming majority of scientific and inventive capacity (92.4% of patent applications) and assign almost all (98.5%) intellectual quasi-rents. The leaders here are North American, Western European and Japanese civilization; in low-income countries (40.9% of the population) accounted for only 0.8% of applications and 0.04% of license revenues (Feabhra, 2013).

The evaluation of financial and investment potential of the area can be used for gross savings in the region, which reflects the financial resources of the area for innovation and investment. However, not all savings are directed to innovation and investment. In their structure already contains the volume of gross fixed capital formation, which should in future be excluded from the calculation. Net savings represent the difference between gross savings and consumption of fixed capital. Thus, at the regional level, the value of gross savings is calculated using the following formula: = gross saving GRP - final consumption. The formula for calculating net savings is as follows: net savings = gross savings - gross fixed capital formation (Kelly and McGuinness, 2013).

For comparative analysis of peripheral areas in terms of development potential, and comparability of the data, the proposed indicators of gross and net savings estimate per capita. The net savings in the Southern Federal District of the Russian Federation in the period from 2007 to 2013 is presented in Table 1.

Table 1. The net savings in the Southern Federal District of the Russian Federation in the period from 2007 to 2013

Year	Republic Adygea	Republic Kalmykia	Krasnodar Region	Astrakhan Region	Volgograd Region	Rostov Region
2007	-11 925	-12 194	-16360	-7 734	-821	-21 578
2008	-12 141	-19039	-19389	-16 099	5 430	-28 621
2009	-21 070	-18573	-32576	-41 302	3 819	-37 616
2010	-37 430	-20624	-53 482	-39 854	4 540	-54 013
2011	-50 843	-21333	-69444	-61 191	-17 141	-50 073
2012	-37 093	-21248	-38 999	-49 202	2 983	-27 257
2013	-19 217	-5 608	-1 999	-24 131	28 779	-2 885

Referring to the data in Table 1, we note that among the peripheral areas of the Southern Federal District of positive net savings per capita was observed only in the Volgograd region in 2009, 2010, 2011, 2012 and 2013. Innovative potential of the peripheral areas seems appropriate to assess from a position of influence on his development factors, namely: technical and technological, development of human factors, institutional, organizational and informational factors, each of which consists of several indicators (Hawley et al., 2010).

For each of the factors evaluated following indicators: for technical and technological factors: domestic expenditure on research and development; receipt of patent applications and issue of security documents; Number of advanced production technologies; number of technologies used; the costs of technological innovation; for the development of the human factor: the number of personnel engaged in research and development; Number of researchers with academic degrees; admission and graduation from graduate school; admission and graduation of doctoral studies; for institutional factors: the presence of the development strategy of innovation at the regional level; regulations in the field of innovation; concept development program of innovation at the regional level; for organizational factors: the number of organizations engaged in research and development; organizations conducting training of doctoral students; innovative activity of organizations; the volume of innovative goods, works and services; technology transfer centers and business incubators; Information for factors: the availability of information on innovative projects to potential investors in the public domain; organizations that have a web site; Number of organizations used special software.

Each indicator is assigned hierarchical ratings, which are then summed in the calculation of the overall ranking of the region. For each indicator, with (i - serial number of the index) the average value (Formula 1).

$$Ci=\frac{\sum_{j=1}^{N} C_{ij}}{n} , \quad (1)$$

where Cij - i-th value of the index for the j-th region; n - number of subjects (regions).

Area changes the i-th index [Cijmin, Cijmax] was divided into n intervals. The first indicator has a rating value rmin = 1, and the last - rmx = M (M - maximum rating). The calculations show that for the calculation of the function r, = f (Cj) was enough to seven intervals, that is rmax = 6. As a result of the conversion of indicators, derived matrix corresponding private ratings r, in which speakers are rating distribution of the peripheral area on various parameters and the rows - the distribution of this ranking for time-personal regions. Each subsystem level characterized rated R, (I - subsystem number (I = 1, ..., 5)):

$$Rij=\sum_{i=1}^{k} r_{ij} , \quad (2)$$

Where k - the number of indicators characterizing the block model. Thus, the innovative potential of the peripheral area has the following analytical expression for the overall rating:

$$Rj = Rt + Rh + RIns + RO + RInf, \quad (3)$$

where Rt, Rh, RIns, RO RInf - ratings subsystems: technical and technological, human, institutional, organizational and informational factors, respectively. As a numeric expression, then (3) defines the level of development of the investment potential for any region.

The innovative capacity of peripheral areas in the Southern Federal District from 2005 to 2011 is characterized by the following data (Figure 2).

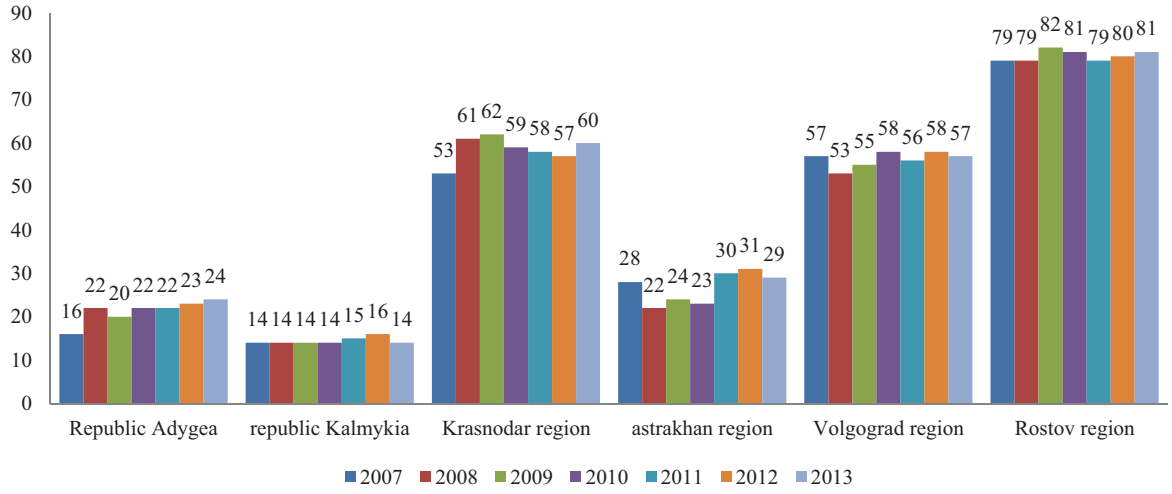

Figure 2. Dynamics of the innovative capacity of the peripheral areas of the Southern Federal District in 2009-2013 (Popkova & Tinyakova, 2013a)

Foremost among peripheral territories SFD is the development of innovative potential of Rostov region (in 2013 - 81 points), followed by Krasnodar region (in 2013 - 60 points) and the Volgograd region (in 2013 - 57 points). Astrakhan region is in fourth place (in 2013 - 29 points), followed by the Republic of Adygea (in 2013 - 24 points) and the Republic of Kalmykia (in 2013 - 14 points). Based on the previously submitted dividing the peripheral areas on donors, recipients and potentially self-sufficient in the territory of the Southern Federal District subjects was as follows (Table 2).

Table 2. Types of peripheral areas of the Southern Federal District of the Russian Federation for 2007-2013 (Popkova & Tinyakova, 2013b)

Region	2007	2008	2009	2010	2011	2012	2013
Republic of Adygea	-	-	-	-	-	-	-
Republic of Kalmykia	-	-	-	-	-	-	-
Krasnodar region	r*	r	r	r	r	r	r
Astrakhan region	-	-	-	-	-	-	-
Volgograd region	r	**s	s	s	r	s	s
Rostov region	r	r	r	r	r	r	r

* r - recipient region; ** s - potentially self-sufficient region.

Recipient regions are the Krasnodar Territory and Rostov Region, as well as the Volgograd region (in 2009, 2011.). For these peripheral areas characterized by a high level of development of innovative potential and a low value of financial and investment potential. Such a combination is useful when potential direct financial resources (borrowing them from other regions of the donor) on the implementation of specific innovation projects. Donor regions should send the available financial and investment potential for the creation of innovative potential, and only then to the implementation of specific innovation projects. Potentially self-sufficient peripheral areas should create an effective mechanism for the transformation of the existing financial and investment potential in specific innovation projects. Such a transformation mechanism is created within the framework of innovation and investment strategy in the region, to identify its goals and objectives, and evaluation of innovative financial and investment potential (Herbert, 2009).

Thus, the formation and implementation of innovation and investment strategy of the peripheral area is based on an assessment of the financial and investment and innovation potential. Types of peripheral areas depending on the ratio of the potential is paramount depend on the innovative capacity as an object of investment of financial resources and are divided into regions of the donor and recipient regions potentially self-sufficient regions. Depending on the type of peripheral areas through innovation and investment strategy of the peripheral areas are developed goals and objectives, as well as the mechanism for implementing the strategy (Indecon, 2013).

4. Results

Innovative activity in the current economic environment is of great importance and enhances the competitiveness of individual regions and the country as a whole. A high level of innovative activity allows you to create the conditions for sustainable economic growth in the long term and the most efficient use of available resources. At this stage of development becomes particularly relevant area of innovation management at the regional level.

Principles of formation of the mechanism of long-term and strategic management of innovation and investment development of the administrative-education must, as well as the principles of management of investment in fixed capital and innovation regional economy, meet the functional purpose of the mechanism of management of scientific and innovative financial and investment development of the region.

In the economic literature, some authors to disclose the essence of the “mechanism” of a particular process or is a part of the socio-economic system (enterprise, industry, the economy) allow, in our opinion, the definition of this biased definition, counting mechanism as part of a system, or implementation of the provisions of declarative normative legal regulation, for example, business entities, the flow of financial and investment, research and innovation, socio-economic and other processes in ways Resourcing undertaken measures that promote the implementation of the targeted areas of cooperation between elements of the system or detailed action within implementation of the adopted legal and regulatory provisions governing the activities of the current socio-economic systems or different levels of production and economic, financial and investment, research and innovation processes carried out in the region, the company, in the industry (Popkova et. al., 2013).

However, the lack of adequate and meaningful definition of “mechanism” as part of administrative actions on the current operation and future development of economic entities sectorial components of the economy or administrative-territorial units, in our opinion, in turn, is associated with low levels of logical and verbal representation of the functional predestination control mechanism of socio-economic systems and administrative-territorial formations.

In this regard, it should be noted that the functional purpose of the mechanism of long-term and strategic management of investment in fixed assets, technical, technological and other innovations may be disclosed on an adequate basis to formulate the concept of "development mechanism".

In accordance with our ideas, the mechanism of development management, as logic-verbal form as part of long-term, strategic development, can be expressed thus its meaningful content, as the activation of the system or the management of investments in fixed assets, innovation through rational interaction elements as a mechanism management and control systems in general (methods, techniques of strategic and long-term management of specific measures, actions within the system).

Control mechanism perspective and strategic development of innovation and investment processes in the above author of its logical-verbal content appears as part of the processor-based management in their functional purpose of maintaining a level of rationalization elemental interaction system, which achieves the necessary (the most possible) economic, financial and social outcomes, the effectiveness of the management and implementation of the whole process of investing in the renovation and modernization of fixed assets, creation and implementation of innovations in the regional economy.

Thus, the established functional purpose mechanisms; management of innovation and investment development of the regional economy is focused on the creation of conditions and realization of potential resource capabilities systems perspective and strategic management of scientific and innovative financial and investment development, to achieve high economic, financial and social results.

5. Discussion

Basic principles of long-term mechanism for management of scientific and innovative financial and investment development of the administrative-territorial entities, in accordance with our view, may be:

- Resource and organizational support for the extrapolation of trends of perspective development of the regional process of investing in modernization of fixed assets, creation and implementation of technical, technological, information, economic and organizational innovations in the region;

- High level economic and mathematical validity and expert forecasts of economic, financial and social results medium-, long-term development process of investment in fixed capital and innovation of business entities administrative-territorial unit;

- The validity of the need to correct the dimensions of economic, financial and social performance, effectiveness of investment in fixed assets, technological, technical, information and other innovations in the long period of time due to the increasing influence of negative factors macro microenvironments exceeding feedbacks previously established and operating a time trends in socio-economic, scientific and innovative financial and investment nature;

- Target orientation control mechanism prospective investment in fixed capital and create innovations for the regional economy to achieve by means of elemental interaction mechanism prospective management of economic, financial and social identifiers effective and efficient innovation and investment development of the peripheral areas in the statistically representative (confidence) intervals;

- Complementarity with the mechanism of the strategic management process of investment in fixed assets, technical, technological, information and other innovations.

Implementation of the principle of mathematical economics and expert validity obtain adequate forecasts of economic, financial, social outcomes, efficiency of investment in fixed capital and innovation businesses and infrastructure complex regional economy (Box 1.2, Figure) represents an opportunity multilevel controls project and program investments in fixed capital and innovation (governments in the region, municipalities, business entities) at the appropriate level of accuracy and significance to establish the reality of achieving planned settlement of economic, financial and social performance, effectiveness of project investment in the region.

Formulation and compliance with the principles in the establishment and operation of the strategic management of project investment must meet the functional purpose of strategic management, which consists in countering all the negative influences of factors macro microenvironments in order to achieve the guidelines of the economic, financial and other performance project investment in the medium, long period of time, and in the increasing influence of positive trends emerging in the external and internal environment of the target orientation to get the best results and the efficiency of investment in fixed assets, creation and implementation of innovations in industrial production.

6. Conclusion

The expediency of accounting and largely determines the impact of regional determinants of the formation of an innovation-oriented regional investment policy in accordance with the present levels of hierarchy in the figure is shown in the following:

- Actualization needs of innovative development of the regional economy of individual subjects of the Russian Federation in terms of strengthening the vertical of state power and the growing role of regional organizations in the financial support of innovation;

- The possibility of rational specialization of the economic system of separate peripheral areas in order to maximize the effect of the territorial division of labor;

- The need to comply implemented in the peripheral area of innovative projects development strategy Mesoeconomics in order to develop appropriate management actions in respect of investments regional authorities;

- The importance of matching the structure produced by the needs of innovative products, as well as financial and organizational opportunities and mechanisms for the regional economy;

- The possibility of individualization of various forms of stimulation of investors at the regional level in accordance with the priorities of socio-economic development of territories.

The need to emphasize the innovative structuring of the economic system of the region, in turn, is due to the following factors:

- The possibility of preserving and strengthening the single economic space of the peripheral areas through innovative development of all its subsystems with the positions of the system and regulatory approaches to the implementation of strategic management;

- The concentration of investments in innovation potential and innovation-active areas of the regional economy (sectors and spheres of the regional economy, large corporations, etc.) and place of effective consumption of finished innovative products;

- Uniform “placement” of innovation across the country as a whole, aimed, inter alia, to equalize the level of socio-economic development of the peripheral areas and others.

The main factors are the determinants of regional innovation-oriented investments in the region, directly corresponds to the so-called “innovative structure” of the regional economy, are, first and foremost, parametric integral characteristics of its building, including economic and geographical position of the region, population and labor force, created on the territory of the productive apparatus, infrastructure and transport factor localized natural resources, scientific and technical potential, social climate, forms of territorial organization of the economy, financial resources, institutional infrastructure investment and innovation, as well as the quality of regional governance.

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Expert Models for the Evaluation of Innovative Entrepreneurial Projects

Marianna S. Santalova[1], Elvira P. Lesnikova[1] & Elena A. Chudakova[1]

[1] Russian Economic University named after G. V. Plekhanov, Voronezh branch, Voronezh, Russia

Correspondence: Marianna S. Santalova, Russian Economic University named after G. V. Plekhanov, Voronezh branch, 67A, K. Marks str., 394061 Voronezh, Russia. Tel: 74-73-239-0763. E-mail: mim@vfreu.ru

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Abstract

In times of crisis development of the economy, when there is less activity of economic entities, changes the structure of assets of organizations. There is a slowdown in innovation and entrepreneurship and innovations (products, processes) also change significantly. So the innovation risks increase dramatically. World experience shows that in periods of financial and economic crises, the most actively introduced innovations that further define the transition to economic growth. Innovative entrepreneurship in the Russian context has always been a highly risky activity. This necessitates the study and systematization of all its components and the final result - efficiency. The last crisis has identified a sharp increase in the risk of innovation development, reduced the probability of success at all stages of innovation, especially for small and medium businesses. However, by themselves these tough market conditions determine the impossibility not only of development, but even simple survival of the organization without innovations that create new business opportunities. Objectively, the growing scale of financial support of the development and commercialization of innovations leads to the fact that private financial support of the Russian entrepreneur becomes insufficient. The need to attract investments and borrowed funds determines the importance of the assessment of innovative entrepreneurial projects before-selling stage. Used in domestic practice, the normative methods for evaluating the effectiveness of innovative projects have drawbacks. In the current environment of uncertainty innovative entrepreneurial project should be considered as a complex system. Its evaluation requires consideration of a significant number of internal and external, quantitative and qualitative factors, and should be conducted by experts as an informal procedure. Expert model for the evaluation of innovative entrepreneurial projects allow us to determine their advantages and disadvantages. Being fairly objective, expert model contribute to the selection of the most effective projects to guide the development of new innovative economy.

Keywords: innovative entrepreneurship, innovative entrepreneurial projects, innovation risk, efficiency, expert model

1. Introduction

Crisis of 2008-2009 convincingly demonstrated that reducing business expenses on innovation slows the development of the Russian innovation system and the Russian economy as a whole. The key anti-crisis approach in the present period is investment in innovation. "Strategy of innovative development of the Russian Federation for the period up to 2020" provides a set of actions for the transition to an innovation economy socially oriented development model (Decree Government of the Russian Federation #2227, 2011).

Innovative entrepreneurship has aim to make a profit through the creation of innovation and diffusion of innovation in all areas of the economy. Unlike traditional business, it uses a new way of enterprise development, such as the creation of new organizational and managerial and production technologies, the creation of new or improved products and because of objective necessity creates innovative infrastructure. The tasks of innovative development differ significantly in the real economy and social sphere. The authors analyzed these tasks and processes in the sphere of activity of enterprises trading in the local market (Lesnikova & Chudakova, 2013).

Innovative entrepreneurship includes scientific, technological, organizational, financial and commercial activities. Scientific innovation activities formed research teams, research teams and laboratories, individual scientists, universities and gives to the market as a final product intellectual inventions and scientific discoveries.

Technological innovation activities implemented scientific and technical personnel research, production teams and aims to create new and improved products, satisfying formed and future needs of target consumers.

Organizational activity of managers of the companies - participants of the innovation project aimed at the implementation of basic management functions for the creation and effective implementation of the project, bringing the structural and organizational relationships in accordance with the principles of innovation and, ideally - the formation of organizational bases of intellectual self-developing organization (Santalova, 2013; Rodionov & Horeva, 2014).

Financial innovation activity is realized by investors at different levels and scales of activity, in various forms (public, banking, equity, venture capital, mixed financing, leasing, forfeiting, etc.), As well as the actual employers, and aims to support innovative projects attractive investment financial resources to all stages of the life cycle. Thus, financial support the introduction and implementation of an innovative project, reduces business risk and increases the efficiency of the project (Santalova, 2013).

Commercial innovation activities aimed at creating an innovation infrastructure, which includes a variety of institutions that ensure the success of innovation processes. This could include the purchase and sale of patents, licenses and know-how; organization supply innovative production; organization of marketing an innovative product etc (Santalova, 2014).

Level of implementation and the commercial effect of the introduction of innovations is determined by many factors, but, of course, crucial financial security state of enterprise innovation potential of the organization and innovative thinking of her top - managers. It depends on a choice of innovation strategy, its resource availability and success of implementation (Santalova, 2013).

Innovative activities aimed at the implementation of innovative projects, as well as the creation of innovative infrastructure and its activities (Федеральный закон РФ от 21 июля 2011 г. #254-ФЗ). In the current competitive market conditions, only an innovation-oriented company is able to survive and develop (Knyphausen-Aufsesszu, 2006).

2. Materials and Methods

Innovative project as a set of measures for the implementation of innovations aimed at achieving economic effects [2]. Calculation of efficiency (W) is carried out according to the formulas (1) and (2):

$$W = \frac{E}{C}, \tag{1}$$

$$W(2) = \frac{E}{C}, \tag{2}$$

where E - the effect (result) of the project; C - costs associated with the project.

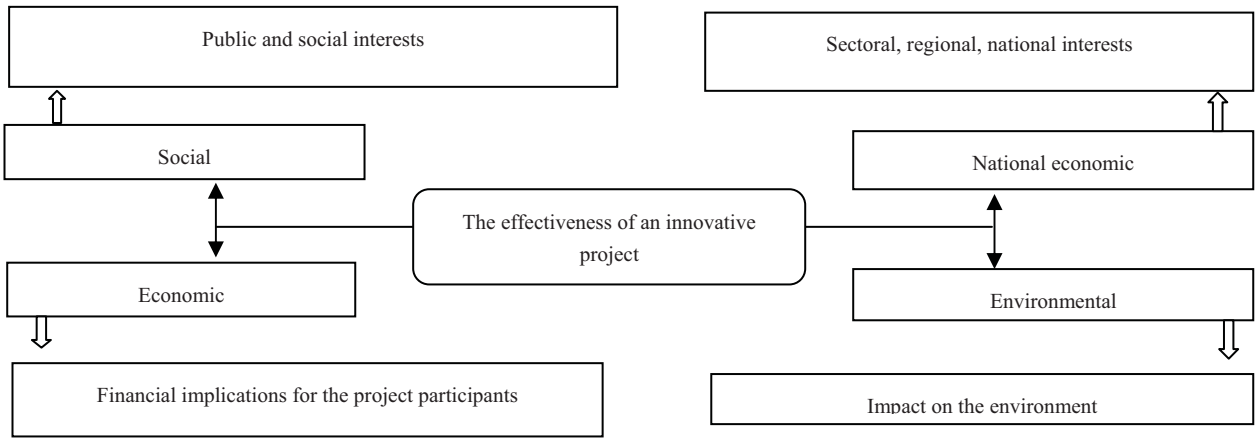

Figure 1. Components of the effectiveness of an innovative project

Today, large innovative projects are implemented at the regional or national level with the system of measures of state or regional support, with the involvement of the budget, and aimed at achieving national economic, fiscal

and socio-economic effects. Medium and small business sells local innovative projects on their own, borrowed and borrowed funds and focuses primarily on the economic effect (Figure 1).

National economic (general economic) effect is the financial results of an innovative project for the national economy or region and is characterized by such indicators as revenues from sales of innovative products and services, from the sale of licenses, patents, know-how, attracting foreign investments and others.

The social effect of the introduction of the innovative project can be expressed in the growth of personal income, optimizing the cost structure of the population, the growth of patriotism and national identity, and generally improve the quality of life of the population.

Commercial (economic) effect reflects the financial results of an innovative project for its direct participants and is calculated as the difference between financial performance and costs. Environmental effects - an important component of any innovation project.

Already in the planning phase of the innovation project entrepreneur is considering ways to solve the problem of attracting financial resources for its implementation. Innovative business is ready to assume the risks associated with the financial activities of the enterprise. However, the growing scale of the financial support for the development and implementation of innovations leads to the fact that the entrepreneur's own financial security is increasingly becoming inadequate.

Implementation of Innovative always requires a significant investment in the selection of personnel, research and development, acquisition of new equipment, new channels of inbound and outbound logistics, marketing support and other new products. No planning and forecasting can not give 100% confidence in the commercialization of the project and future customer loyalty. All this defines an increased risk of innovative entrepreneurship, lack of financial resources and the need for external involvement.

Financial institutions and private investors are well aware of the high level of risk and innovation, at the same time, a high yield of innovation in the growth stage in the product life cycle. These specific features of innovative entrepreneurship determine the need for the involvement of experts and / or use of proven domestic business - practice methodologies to assess the effectiveness of innovative projects. Normative documents on the evaluation of investment projects are the "Guidelines for the evaluation of investment projects and their selection for financing" (Kossov et al., 2000).

Russian authors describe the main methods of evaluating the effectiveness of innovative projects: dynamic (in terms of NPV - Net Present Value, IRR - IRR, MIRR - Modified IRR, PI - profitability index, DPP - discounted payback period of investment) and static (at indicator PP - payback period without discounting, ARR - by a simple rate of return) (Proskurin, 2011).

Stage preliminary assessment is a necessary component of innovation and significantly reduces its risk. Examination of entrepreneurial innovation project on economic efficiency is carried out at a stage when the market is not yet known and has a high degree of uncertainty, not identified promising technologies, poor raw material supply, insufficient information and its reliability is low. Therefore, an innovative entrepreneurial project must be regarded as a complex system in the face of uncertainty. Evaluation of an innovative project requires the simultaneous consideration of many external and internal, quantitative and qualitative factors, so conducted as an informal procedure, based on expert assessments nealgoritmizuemyh (Kossov et al., 2000).

Modern systems support management decisions are focused on the active use of expert information. The most simple and accessible method of receipt - the voices of one expert. However, in this case, increases dramatically the subjectivity of the final result of expert evaluation. Engaging a group of experts allows us to go from the individual point of view of some experts to a common agreed objective group decision.

To assessment we need to involve experts with experience in the study field and in the expert evaluation, with business intuition and strategic foresight of the industry. A peer reviews should use scenario forecasting methodology and be interval: for optimistic, base and pessimistic forecast.

In the economic literature describes various expert models, but for the assessment of innovative business projects often use multi-factor model expert on the principle of "1-0" on a points basis and integrated assessment of the viability of the project. When using multi-factor assessment model on a "1-0" members of the competition committee by team decision-making are essential to define the test innovative project factors and the optimum number of experts. As evaluated factors often use the project complies with the goals and objectives of the field of activity and resource potential of the enterprise; the claimed payback period and interest rate requested financial possibilities of creditors; ensure compliance with the borrower's requested level of funding et al. Evaluation Form Traditional (Table 1).

Table 1. Evaluation form an innovative project using a multifactor model on a "1-0"

Name factor (criterion)	factor assessment (1 - if the project meets the criterion, 0 - if the project does not meet the criteria)
Criterion 1	1 or 0
…	…
Criterion №	1 or 0
…	the sum of the column

The advantage of the model - its simplicity, as experts assess all factors answered "yes / no", but it also determines the advantage of the lack of a model - not very accurate assessment results (sum of the positive responses to the column "Factor Assessment").

In this model, an innovative project is deemed effective (suitable for commercialization), if the amount on the column "Factor score" exceeds a predetermined threshold. Multifactor pricing model of innovation project on a points basis provides a more accurate and correct results, as assessed using the gradation of quality factors. Pre-formed point system assessment of each factor is under consideration, preferably 5 and 10-point system (Table 2).

Table 2. Evaluation form an innovative project using a multivariate model based on a 5-point system

Point	The degree of compliance of the project *i*-th criterion
5	Very good
4	Good
3	Satisfactorily
4	Poorly
5	Very bad

For each factor, develop a scale assessment so as to include all possible qualitative or quantitative "intervals of compliance." Intervals of conformity must be such that a randomly selected project with equal probability could get in each of the specified intervals. Preferably use of intervals in one point. The evaluation result will be expressed by the sum of points.

Multifactor expert model for assessing the viability of an innovative project uses experts strictly defined algorithm (Figure 2).

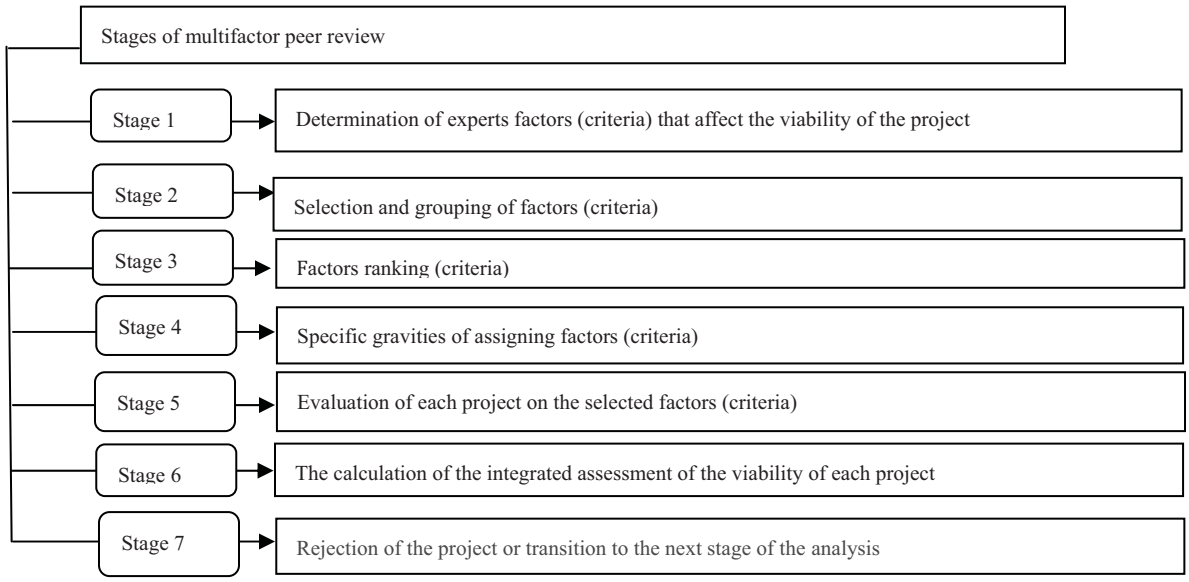

Figure 2. Algorithm for multi-expert model evaluation

To calculate the integral evaluation of the viability of an innovative project using the formula (3):

$$I = \sum_{i=1}^{m} C_i \cdot w_i \,, \tag{3}$$

where I - integral indicator of the viability of the project;

w_i - w i-th factor, wherein the total weight of all the factors is 1;

C_i - evaluation of the project by the i-th factor;

m - number of evaluated factors.

If C_i ranges from 1 to 10; w_i - ranging from 0 to 1, then I will vary from 0 to 10.

Using a multi-expert model allows us to consider the characteristics of assessment of viability of the innovative project in quantitative terms, but experts can accurately express their opinion on each i-th factor.

Quite often, potential investors see exactly comparable projects. In such cases, the use of multi-factor models in a comparative analysis of two or more projects usually includes an assessment of the following factors: the average annual profitability, payback period, return on investment over the life of the project as a whole and taking into account the discount, the cost of insurance against inflation losses, the carrying capacity target market, marketing costs to attract the buyer and the formation of a loyal segment of consumers, a unique innovation, speed of implementation of the project, the level of commercial risk and others.

3. Results

It is important for companies implementing innovative projects to form a model of evaluation of the innovation process, which allows us to consider the state of the innovation of its activities as a vector in three-dimensional space factors (Santalova, 2014). Along the axes of the model laid respectively enterprise innovation projects, innovation underpinning the project innovation and the environment of the project. Surface defined in this three-dimensional space is a function of state enterprises in the innovation process, every point of which characterizes the state of innovation enterprise at a given time. Accordingly, for each point on the surface there is a risk of its value innovation and function of the state of the innovation process, given in coordinates "innovative project", "novelty", "environment" risk determines the dynamics of innovation enterprises.

The "novelty of innovation" is an indicator of innovation in three classification criteria: type of novelty, degree of radicalism and depth of the changes. It is obvious that, depending on the depth of insertion of innovative changes innovative uncertainty grows, and consequently the risk of innovation.

The "environment" is the space of an innovative project, which can be either within the company, and at the level of the state or states. Under the environment in this case refers to the level of innovative activity of the enterprise. In this case, it is a broader concept than the "market" as "market" covers only part of the relationship, characterized by the ratio of sale. That is, for example, internal innovation to change the structure of the enterprise cover the concept of "market" indirectly but nonetheless, can be carried out in enterprises, both national and international level. Medium risk increases with increasing levels of difficulty (from a small company to a multinational company).

At the time of formation of market conditions require an innovative portfolio of innovative enterprise as complex projects, activities that ensures its competitive advantage and a steady income. The portfolio can be formed using a matrix by means of which it is convenient to rank innovative projects according to their priority for the company.

Assume that on the basis of analysis we build an innovative matrix and obtained a list of innovative projects leading to the achievement of specific objectives of the enterprise. The challenge is to determine which of the proposed projects include a plan and implement, i.e. in the formation of a portfolio of innovative projects. In this case, the assessment procedure may consist of the following steps: 1. Ranking of innovative projects and their profitability, the importance of goals that can be achieved with their help. The term "coefficient problem" goal, which is calculated as the ratio of the importance of this goal for a common purpose of the enterprise (numerical coefficient) to the attainability of this goal realization of specific innovation project. 2. Determination of the time required for the implementation of each of the considered innovative projects. 3. Determination of the cost of the project or expert judgment. 4. Construction of a diagram of innovative projects and achieved with the help of their goals (Santalova, 2013).

If we make a ranking of innovative projects under this scheme, one can immediately conclude that the implementation of innovative projects to be 1.2 priorities. Risk assessment can be carried out at the same time, based on priority, by calculating the integral index and the cost. The structure of the integral index of innovation risk can be represented as follows (Table 3).

Table 3. Structure of the integral index of innovative enterprise risk

Investment portfolio	Novelty of innovation	Environment (level of investment activeness)
Risks of innovation project: - Negative results of R & D; - Not achieving planned, the technical parameters in the course of technological development innovation; - Advancing innovation and technological level of technological capabilities of production; - Advancing innovation and technological level of technological capabilities consumption (operation); - Errors in the planning of the project; - Wrong choice of economic objectives of the project; - Not full support of the project financing; - Enforcement of property rights for the project; - Not in time-to-market; - Marketing mistakes marketing the project; - Occurrence of unexpected costs and cost overruns of the project; - Marketing mistakes; - Conflict with the law and the public; - The emergence of the use of new technologies and products or by-deferred over time manifestations of problems and risks; - Violation of the terms of the project.	- New to the industry, the world; New for this project; - Basic improvers, system, grow, psevdoinnovations; - Changes in the properties of the original product, quantitative changes, adaptive changes, the new version, the new generation, a new species, a new genus (range).	Within the enterprise; - regional national; - transnational
$R_i = \prod_{t=i}^{T} r_t$; $R_{portfolio} = \prod_{i=1}^{I} R_i$ - an indicator of the overall risk of the portfolio of innovative projects	$R_{novelty} = \prod_{k=1}^{K} n_i$ - an indicator of the overall risk of novelty	$R_{environment} = \prod_{z=1}^{Z} s_z$ an indicator of the overall environment risk
$R_{indicator} = a_1 R_{portfolio} + a_2 R_{novelty} + a_3 R_{environment}$ - Integral indicator of innovation risk		

4. Discussion

As noted above, the success of the innovation project are greatly affected by prevailing in the organization of innovative entrepreneurial potential. The use of expert assessment models of innovative projects constituting potential improves the objective results. Such factors include the need to experience and professional competence of top managers, their personal characteristics (risk appetite, ambition, enthusiasm, hard work)

(Ghoshal & Bartlett, 1997; McGrath, 2014) and business skills (business ability, organizational skills, strategic vision and business development of the industry).

It should be noted that in the last decade has increased dramatically the complexity of the evaluation of innovative projects (Kretova, 2008; Taydaev 2014). This is due to the increased technological complexity of innovative objects, turbulence of the environment, increasing the intensity of competition for markets, increasing levels of intellectual component in the production, treatment and management.

5. Conclusion

The methods of formation of a group of experts based on the decision of order averaging operators (Startsev, 2004). They allow you to align the individual expert assessments on the basis of fuzzy majority, take into account the quantitative and qualitative information in the formation of the generalized evaluation by a large number of factors in the conditions of uncertainty. The use of software in the process of concerted group of panel decisions can significantly improve the effectiveness and validity of the examination taken on the basis of its decisions on the effectiveness of innovative projects.

Acknowledgement

Thus, the use of expert models for selection of innovative entrepreneurial projects provides the assessment of their investment attractiveness and feasibility.

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Risk Aspects of Creation of Investment E-platform as a Tool of Support for Small Innovative Enterprises

Yuliya N. Stepanova[1], Irina V. Sibiryatkina[1] & Valentina E. Sukhova[1]

[1] Voronezh State University of Forestry and Technologies (VSUFT) named after G. F. Morozov, Voronezh, Russia

Correspondence: Yuliya N. Stepanova, Voronezh State Academy of Forestry and Technologies (VSAFT) named after G. F. Morozov, Voronezh, Russia. Timiryazeva str., ap. 8, Voronezh, 394087, Russia. Tel: 74-73-253-7847. E-mail: vglta@vglta.vrn.ru

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Abstract

The article shows the results of research for the allocation of risk aspects of creation of investment E-platform for support for small innovative enterprises, which possess an important role under conditions of transition of Russia's economy to innovational path of development. Small innovative enterprises can become one of the key subjects of innovational activity, providing quick and effective development and commercialization of various innovations. However, under modern Russian conditions, small innovative enterprises do not fulfill that role fully. It is established that creation of investment E-platform will be a tool for active development of small innovative enterprises, using various approaches for stimulation of demand for innovations and investments into their development and use in modern innovative economy. On order to provide favorable conditions for creation and functioning of investment E-platform, it is necessary to study specific risk aspects. On the basis of identification of factors and reasons for risks emergence, it is necessary to determine the classifier of possible types of risks, depending on the stage of innovative process, which will allow formulating the portfolio of the most significant risk aspects of creation of investment E-platform, aimed at attracting the maximum number of investors.

Keywords: small innovative enterprises, investment E-platform, risks, risk aspects, risk portfolio, risk management

1. Introduction

The task of building innovative economy in Russia is one of the most important in the conception of long-term development of the country by 2020. New technologies and knowledge form real competitive advantages and become a decisive factor for economic growth. Transfer of technologies (process of transition of technologies from the sphere of development for practical use) is the fastest in small enterprises.

Small innovative enterprises (SIE) are a connecting link between science and production. In high-tech economies, small innovative enterprises comprise the most dynamic sector of innovative economy, which is capable to quickly react to the requirements of the market. Small enterprises often take the risk while developing new products and technologies and taking them to the market. Due to risk character of their activity, their list constantly changes: some companies disappear, and others emerge.

Despite the fact that Russia is not a leader of innovational development, its potential in this sphere exceeds the result characteristics manifold. Under such conditions, the involvement of our country in global innovative processes is an absolute requirement, as, otherwise, it will be impossible to reach the average global technological level and reach the indicators that are similar to those of the rivals.

According to the research data, share of small innovative enterprises in Germany constitutes 62%, in Norway – 49%, in France - 38%, in Great Britain – 23.7%. The highest indicator of innovative enterprises among the European countries belongs to Ireland - 75%.

National Science Foundations (USA) gives the following indicators. Among the science-intensive companies, the share of subjects of small business constitutesт 89%; at that, the share of small innovative enterprises among enterprises of the sphere of software development is 98%, 97% – in the sphere of photonics and optics, 96% – in

the sphere of science-intensive service, and 96% - in the sphere of conduct of qualifying operations. Small innovative enterprises comprise approx. 90% of the total number of companies of electronic industry of the USA.

As the number of Russian small innovative enterprises is far less than foreign analogs, it is a serious problem for the country as a whole and for regions. Thus, a lot of investors are not eager to invest their money, until they know what risks wait for them and what their profit will be (Morkovina, 2014).

Small business has the largest sensitivity for socio-economic situation, for any changes in external environment, which predetermines the necessity for its support – primarily, financial one.

In order to solve this problem using the foreign experience, investment E-platforms are created in the Russian federation; they fulfill the standard-building role for all elements of infrastructure of small innovative enterprises with involvement of financing into this sphere and support for development.

Investment E-platform (IEP) allows investors and innovative enterprises to effectively cooperate, increasing the accessibility of capital for small Russian companies.

IEP provides a single informational and technological infrastructure in the sphere of small innovative enterprises, which allows improving the informational penetration between authorities, subjects of small innovative business, and subjects of investment activity.

At that, it is necessary to allocate risk aspects which can hinder the creation, development, and effective functioning of IEP, as a tool of support for small innovative enterprises.

2. Technique

During the research, the following characteristics of the risks that influence the creation of IEP were viewed: economic nature, objectivity of manifestation, uncertainty of consequences, expected unfavorability of consequences, variability of the level, and subjectivity of assessment. Various classifications of risks were analyzed: as to type of danger, sphere of manifestation, possibility of forecast, sources of appearance, size of possible damage, complexity of research, financial consequences, character of manifestation in time and possibility for insurance aimed at the building the risk classifier for innovational projects of small enterprises.

During the research, the main stages of analysis of risk aspects, peculiar for the project of creation and functioning of IEP were determined:

- forming the enlarged risk universe;

- identification of risks, i.e., allocation the factors and reasons for their emergence;

- evaluation of risks using the qualitative and quantitative methods;

- analysis of probability of risk situation;

- building the profile of risks on the basis of evaluation of risk aspects of creation and forecast of efficiency of IEP functioning;

- choosing the strategy for risk aspects management.

During the research, at the stage of risk evaluation, the qualitative and quantitative methods were used.

Qualitative methods allowed determining the role and value of each specific risk as to key characteristics: value and level of danger. We used the analogues methods and expert method for risk assessment.

Quantitative methods were used for determining the specific size of financial damage from financial risks in totality:

- analysis of scenarios for modeling the situation in view of optimistic, pessimistic, or conservative forecast;

- Monte-Carlo methods for analysis of investment risk aspects, taking into account the higher possible amount of external environment factors.

As the main methods of risk management for creation of IEP, as a tool for support for small innovative enterprises, the following should be used: distribution of risks, diversification, limitation, insurance, hedging, avoiding risks, making decisions as to overcoming the risks.

3. Results

The research showed that in respect to EIP, the factors of risk aspects emergence are closely connected to the life cycle of innovative project of small enterprise. On the basis of the results of ranking scores, involving the experts, the risk rankings were determined.

It is determined that risks, related to EIP at the stages, are ranked in the following way:

Stage of formation:

– risk of non-receipt of funds, required for realization of the project;

– risk of insufficient level of staff assistance;

– deviation of design and development work parameters from the planned ones;

Stage of development:

– risk of insufficiency of involved investors;

– lack of result during the planned period;

– risks of wrong choice of innovational projects;

– risks of insufficiency of financing for the project;

– lower parameters of functioning as compared to the planned ones;

– risk of nonfulfillment of economic agreements.

Stage of functioning:

– risk of lack of funds for self-financing of the project;

– risk of non-fulfillment of investors' obligations;

– risk of appearance of new rivals in the market.

It may be stated that identification and assessment of risks allow forming the part of the risk aspects profile. For that, the formation of risks group was conducted, reflecting the specifics of the project, with establishing the priorities, and the probability of risk events emergence was evaluated.

Probability of risk event emergence was evaluated by the expert analysis method – expert evaluations of the specialists in this sphere. The research viewed any possible risks and level of their influence on the viewed project. The level of supposed risks and their list were formed according to individual knowledge of them.

A powerful analytical basis was used for filling in the table. In case of having all the necessary data, the analyst put in the table the specialists' opinion as to the analyzed sphere. The risk was determined in percent. The higher the percent, the higher the risk. Then, in order to determine the possible influence of risks on the work of small innovative enterprise (project realization), the financial indicators were discounted according to the given figures (Table 1).

Table 1. Final results of expert commentary as to probability of emergence of risk event of creation and functioning of IEP

Expected risk	Line of risk event								
	–60%	–40%	–20%	–10%	0%	10%	20%	40%	60%
Risk of non-receipt of funds, required for realization of the project	—	—	X	—	—	—	—	—	—
Risk of insufficient level of staff assistance	—	—	—	—	X	—	—	—	—
Risk of insufficiency of involved investors	—	—	—	—	—	—	—	X	—
Risk of lack of result during the planned period	—	—	—	—	—	X	—	—	—
Risk of wrong choice of innovational projects	—	—	—	—	X	—	—	—	—
Risk of insufficiency of financing for the project	—	—	—	X	—	—	—	—	—
Risk of absence of expected effects	—	—	—	—	—	—	X	—	—
Risk of lack of funds fort self-financing of the project	—	—	—	—	—	—	X	—	—
Risk of non-fulfillment of investors' obligations	—	—	—	—	—	X	—	—	—
Risk of appearance of new rivals in the market	—	—	—	—	—	X	—	—	—

According to the above mentioned, the following are the results of the analysis and the profile of risk aspects of creation and functioning of IEP (Table 2, Figure 1).

Table 2. Results of analysis of risk aspects of creation and functioning of IEP

Risk	Significance		Probability of manifestation	
Risks at the stage of organization				
Risk of non-receipt of funds, required for realization of the project	0.92308	high	–20%	low
Risk of insufficient level of staff assistance	0.84615	high	0%	low
Risks at the stage of development				
Lack of result during the planned period	0.84615	high	10%	medium
Lower parameters of functioning as compared to the planned ones	0.61538	medium	10%	medium
Risk of insufficiency of involved investors	0.92308	high	40%	high
Risk of wrong choice of innovational projects	0.76923	medium	0%	low
Risk of insufficiency of financing for the project	0.69231	medium	–10%	low
Risks at the stage of functioning				
Risk of absence of expected effects	0.92308	high	20%	high
Risk of lack of funds fort self-financing of the project	0.92308	high	20%	high
Risk of appearance of new rivals in the market	0.76923	medium	10%	medium
Risk of non-fulfillment of investors' obligations	0.84615	high	10%	medium

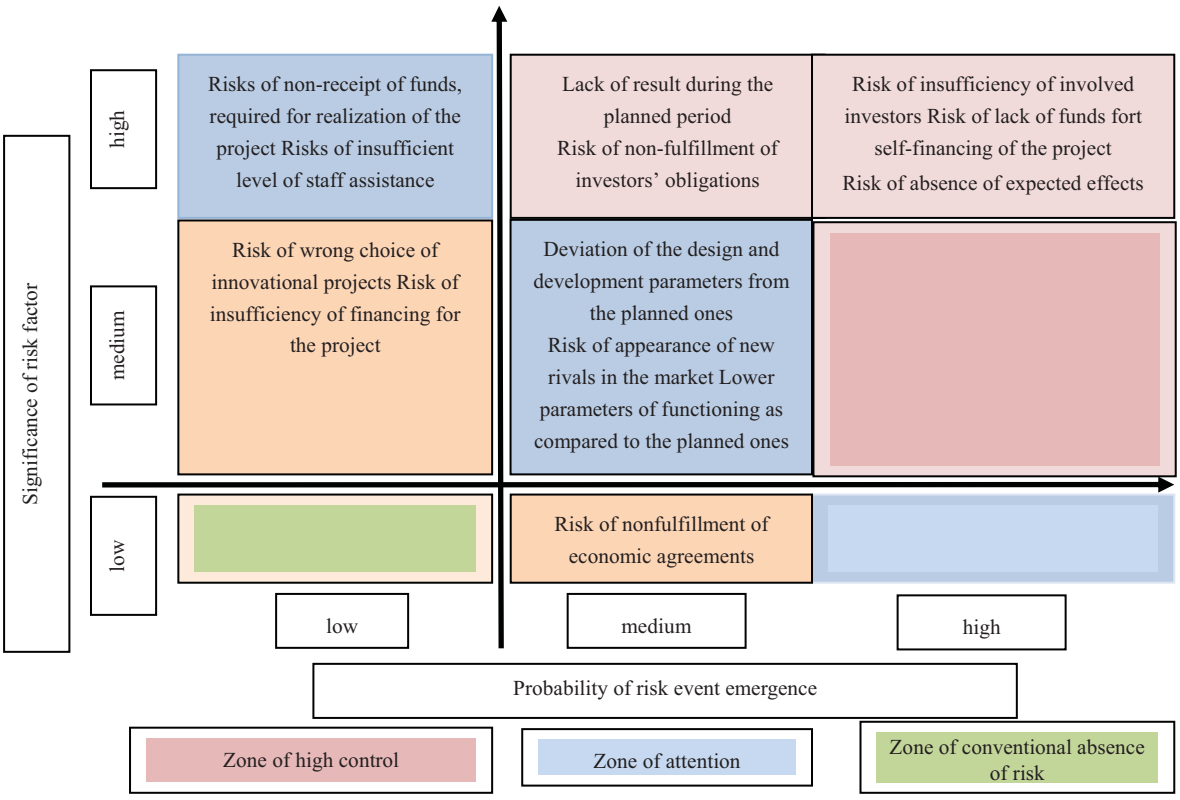

Figure 1. Profile of risk aspects of creation and functioning of IEP

As per the risk profile, three risk zones were determined:

- zone of conventional absence of risk; - zone of attention; - zone of high control.

The resulting profile of risk aspects reflects a variety of risks in the zone of high control, which leads to formation of effective strategy of their management. The practice of management admits the cases of avoiding risky innovative projects of small enterprises through their minimization: rejecting unreliable partners, risky projects, guarantors, etc.

4. Discussion

The process of creation and functioning of IEP, as a tool for support for small innovational companies, is, on the one hand, controlled, but, at the same time is characterized by the high level of uncertainty of dynamics of main factors, related to attraction of investors which determines its results and efficiency. In order to ensure favorable business climate for small enterprises, which start the innovations, it is advisable to calculate risks and chances, forecast difficulties, and try to minimize possible negative deviations. These tasks can be solved by creation of the system of risk management (Troyanskaya, 2014).

For the risk aspects, peculiar for creation of IEP for support for projects of small innovative enterprises, the preferable directions of minimization are determined in Table 3.

Table 3. Directions of minimization of risk aspects of IEP creation

Risk	Directions of minimization
Risks of wrong choice of innovational projects	Necessity for elaboration in the issue of evaluation of the role of short-term and long-term interests of enterprise's owners and of assessment of consumption market
Risk of non-receipt of funds, required for realization of innovative project	Elaboration of the project, package of the project, development of competent business plan
Risk of use of self-financing of the project	Involvement of external sources of project financing
Risks of current resources supply	Careful choice of supplier
Risk of insufficient level of staff assistance	Careful choice of specialists that share the company's values, long-term motivation due to improvement of the wages policy
Risk of insufficient segmentation of the market	Studying the market condition
Achievement of negative result	Necessity for elaboration in the issue of evaluation of the role of short-term and long-term interests of enterprise's owners, evaluation of consumption market, and choice of realization methods
Absence of results of implementation in the planned period	Tracking the periods of product development as to the checkpoints (monthly or more often).
	Tight control of expenses from the business founders. Elaborated development of technical task
Risks of use of external sources for financing	Careful choice of external sources of the project financing
Risk of use of combined method of financing the project	Elaboration of the mechanism of attraction of various sources for the project financing
Risk of appearance of new rivals in the market	Creating stable competitive advantages for our products. Advantage of early rollout. Forming market barriers for transition to the rivals' products
Risk of wrong choice of the strategy for new product sale	Organizing the network of sales and the system of promotion of novelties to consumer
Rejection by the market	Studying the market, monitoring the rivals, close cooperation with potential clients. Creating stable competitive advantages for products.
Lower volumes of sales as compared to the planned ones	Constant improvement of the line of products, its technological possibilities and design.
	Development of the system of reliable protection against unsanctioned copying.
	Preliminary agreements as to implementation of innovative products at the stage of development, elaboration of the life cycle model
Risk of increase in expenses for development of business	Tough control of expenses from business founders
Risk of later achievement of breakeven point	Tough control of expenses from business founders and managers

The conducted research showed that the stage of creation of IEP in the zone of high control includes the following risks:

– risks of insufficiency of involved investors;

– risk of insufficiency of funds for self-financing of the project;

– risk of absence of expected effects;

– absence of result during planned period;

– risk of nonfulfillment of investors' obligations.

All the above mentioned risks are advises to bring down to 2 aspects:

1. Threat of lack of investors for financing small innovative enterprises, which can have negative consequences for self-financing of IEP.

In this case, the nonfulfillment of investors' obligations might be one of the reasons of lack of investments. In order to prevent the emergence and growth of this threat, it is necessary to develop a complex marketing strategy for attraction of investors; conduct constant monitoring of the level of small innovative enterprises' provision by investments; realize the complex of stimulating measures for attracting investments into the platform for financing small business.

2. Risk of non-fulfillment of targeted landmarks – both in time and in view of effects.

These risks have organizational nature. That's why their evening-out will be ensured by the permanent control of the process of realization of this project. For the purpose of the highest efficiency of the process of formation and further functioning of IEP, it is advisable to develop the gradual plan of realization of the planned tasks; determining the "points" of control and performing the direct control.

The conducted research determined the risks of the attention zone:

–risk of non-receipt of funds, required for realization of the project;

–lower indicators of functioning as compared to the planned ones;

–risk of insufficient level of staff assistance;

–deviation of design and development parameters from the planned ones;

–risk of appearance of new rivals in the market.

5. Conclusion

It may be concluded that the creation of IEP, as a tool for support for small innovative enterprises and, primarily, the development of the strategy of management of risk aspects requires the special attention to the following positions.

One of the essential risks, emerging at the initial stage of IEP functioning, is the risk of wrong choice of innovative project. It increases proportionately with the growth of expenses, suffered by the enterprise at initial stages of innovation's life cycle; but by the moment when innovations is acknowledged in the market, the possibility for losses for this type of risk reduces to zero. One of the reasons for emergence of this risk is unfounded allocation of priorities of economic and market strategies of organization, which are capable to make a contribution into achievement of the organization's goals.

Next type of risk is the risk of not providing the small innovative enterprises with the sufficient level of financing. This risk includes; risk of non-receipt of funds, required for the development of innovative project; risk of use of self-financing; risk of use of external sources of financing; risk of use of combined method of project financing, i.e., the organization uses several sources simultaneously.

Marketing risks of the developed innovative projects of small enterprises include the following: risk of insufficient segmentation of the market; risk of wrong choice of targeted segment of the market, which is emerging when demand for a novelty in the chosen segment is unstable or demand for novelty in that segment is not formed yet; risk of wrong choice of the strategy of sale of novelty due to unsuccessful organization of the network of sale and the system of novelty promotion to consumer; risk of ineffective advertising of new products or products with improved characteristics.

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Risks and Threats for Economic Security in Forest-Based Sector, Generated by Possible Climate Changes

Artem V. Konstantinov[1], Tatyana S. Koroleva[1], Oleg I. Vasilyev[1] & Elizaveta A. Shunkina[1]

[1] Saint Petersburg Forestry Research Institute, Saint Petersburg, Russia

Correspondence: Artem V. Konstantinov, Saint Petersburg Forestry Research Institute, Institutsky pr., 21, Saint-Petersburg, 194021, Russia. Tel: 7-812-552-8021. E-mail: konstantinov_a82@mail.ru

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Abstract

Due to expected climate changes, there is a forecast for arising of variety of interconnected and interdependent threats, leading to growth of risks in forest-based sector of economy.

Study of risk, as an economic category, has substantial significance for scientific and practical activity in forest-based sector, as it allows identifying the most dangerous threats for economic security.

This research includes the systematization of risk factors, caused by possible climate changes, with the allocation of the most dangerous ones which generate threats in forest-based sector of economy. Analysis of revealed risks is conducted on the basis of statistical methods of expert evaluation.

It has been established that most of threats for economic security in the sphere of forest use are related to climate change and have stochastic nature, which is determined by a large share of uncertainty of existing factors (air temperature, air and soil humidity, extreme weather phenomena). All of this significantly complicates the planning of work of forest relations members which in this case are the subjects of economic security.

The article emphasizes that the main problems of future forest-based sector will be caused by the change of forests productivity. Climate change, which could lead to forests' drying out, change of forest ecosystems, increase of the level of fires and broad-scale natural disasters will inevitably cause the difficulties in material and technical provision of forest-based sector and increase of expenses for all forestry operations. Consequently, there is a forecast for growth of risk factors in entrepreneurial activity, which will lead to risks of decrease of employment of population in forest husbandry, aggravation of labor conditions, reduction of profits of the sector, and decrease of employees' income. Economic and ecological consequences of climate change will have a vivid regional character.

Keywords: risk level, threats, social and economic security, forest-based sector

1. Introduction

Risks accompany any economic activity, but in forest-based sector they are most dangerous due to the difficulty of their complex evaluation with regard to indirect factors and factors that have long-term consequences.

Economic efficiency of forest economy supposes, as a rule, the quantity of production (products and services), manufactured by forests. These are economic indicators which can be easily measured; they are related to the results of forest industry work (Morkovina, 2014). In forest-based sector, besides influence of internal risk factors, caused by high level of unpredictability of results of forestry production, which, in its turn, is caused by long production cycle, technologies, and techniques of forestry works, the significant role belongs to external uncontrolled factors – primarily, natural, climate, and anthropogenous. In such cases, evaluation of efficiency of processes and probability of manifestation of risks often includes methods of indirect evaluation (FAO UN Global Forest Resources Assessment 2010; State of forests in Europe by 2011/ Short review for persons making decisions, 2011).

2. Methods

In order to allocate and analyze risks, caused by the influence of natural factors, the authors used the expert evaluation method, based on the survey of leaders of scientific and research organizations of forest-based sector. The respondents included five scientific-research institutes within the jurisdiction of Federal Forestry Agency.

In order to process the results of survey and evaluation of risks and threats in the forest economy system, 2 criteria were chosen:

(1) result (value of consequences) of the risk manifestation (scale: from "minimal consequences" to "huge consequences");

(2) probability of risk manifestation (scale: from "manifestation is unlikely" to "constant manifestation").

For evaluation of risk values, the Harrington desirability scale was used, supplemented by verbal description of every interval of scale (Bezborodova, 2014). Evaluating such indicator, as risk level, it was supposed that (Morkovina et al., 2014):

- "critical risk level" corresponds to numerical value in the interval 1.0-0.8;
- "dangerous risk level" – numerical estimate = 0.79-0.60;
- "acceptable risk level" – 0.59-0.40;
- low risk level 0.39-0.2;
- insignificant risk level 0.19-0.0.

Evaluation of consequences and probability of realization of risks was performed by expert method, using the following formulae:

$$Pn_i = \frac{\sum_{J=1}^{N} Pn_{ij}}{N} \quad (1)$$

where, Pn – risk consequences of realization of i-risk;

Pn_{ij} – risk consequences of realization of i-risk, according to j-expert evaluation;

j – No. of expert (from 1 to N).

$$Pв_{ij} = f(Pn_i \cdot W_i) = \frac{\sum_{j=1}^{N} Pn_{ij} \cdot W_{ij}}{N} \quad (2)$$

where $Pв_{ij}$ – evaluation for probability of manifestation of i risk by expert No. j.

Wij- probability of manifestation of i risk, according to expert No. j.

Based in the study of factors that determine the emergence of risk situations, there was performed a systematization of risks with allocation of the most dangerous ones, which generate threats in forest-based sector of economy.

Informational basis for analysis and allocation of tendencies consisted of the data of Ministry of Natural Resources and Ecology of the Russian Federation, Government reports on the state of natural environment, state and use of forest resources, development of forest economy and forest management in the Russian Federation.

3. Results

Study of risk, as an economic category, has a substantial significance for scientific and practical activity in forest-based sector, as it allows identifying the most dangerous threats for economic security.

Most of the threats for economic security in the forest economy sphere, caused by climate change, have stochastic nature, which is determined by a high level of uncertainty of existing factors (air temperature, air and soil humidity, extreme weather conditions). This largely complicates the planning of work of members of forest relations, which are, in this case, the subjects of economic security (Konstantinov, 2014).

For classification of threats for economic security of forest husbandry sphere under conditions of anthropogenous change of climate, the following functional constituents are allocated: change of forest productivity, biodiversity, water resources, increase of the risk of natural fires, diseases, and forest pests, extreme weather conditions, socio-economic and institutional component (Table 1).

Multidimensionality of the risk of forest husbandry under the condition of change of natural and climate situation causes the possibility for its many interpretations – firstly, as uncertainty of losses and income, and secondly, as probability (threat) of loss by the real sector of economy of the part of resources, loss of revenue, or emergence of additional expenses as a result of chosen policy.

Table 1. Classification of threats for economic security in the sphere of forest economy under conditions of anthropogenous change of climate

Functional components of economic security	Names of threats for economic security
Change of forest productivity	Decrease of forest productivity, caused by change of temperature and air humidity, leading to reduction of their material and financial assessment
	Increase of forest productivity, caused by change of temperature and air humidity, leading to growth of their material and financial assessment
Changes in the level of biodiversity	Changes of life status of species on the administered territories, leading to decrease of investment attractiveness of forest ranges
	Implementation of migrating species on the administered territories
	Fragmentation of administered territories
Changes in accessibility of water resources	Lack of water, water stress, and increase of drought, decrease of crop yield of agricultural lands due to desertisation of territories
	Rise of humidity and changes in seasonal patterns of falls, decrease of crop yield of agricultural lands due to mire formation
Increase of risk of natural fires in forests	Rise of the number, frequency, and size of natural fires in forests, leading to reduction of volume of forest resources and timber harvesting, outflow of enterprises and labor resources from the sphere
Increase of risk of massive distribution of pests and forest diseases	Rise of number of outbreaks of massive breeding of insects, pathogens, and invasive types, leading to decrease of quality of forest resources, volumes of timber harvesting, and value of forest
Increase of risk of emergence of extreme weather conditions	Rise of the frequency and intensity of floods
	Rise of frequency and intensity of storms
	Rise of frequency of late autumn and prevernal frosts
Changes in socio-economic and institutional conditions	Changes in sectorial markets
	Rise of risk of economic losses
	Development of shadow market of timber

Table 2. Systematization of risks in the system of forest husbandry

Complex risks	Simple risks
Political and law risks	Risk of limiting export of products and resources
	Risk, caused by actions of authorities: confiscation of assets, termination of contracts, cancellation of licenses
	Risk of nonpayment from government buyers and customers
	Risk of unfavorable change of tax legislation
	Risk of administrative barriers, constant revisions, and corruption
	Risk of unreasonable growth of requirements from management bodies of forest husbandry
	Risk of unstable economic situation (inflation growth)
	Risk of unfavorable change of forestry legislation
Productive-economic risks	Risk, caused by sale of finished products or service rendering
	Risk of the growth of rent
	Risk, caused by organization of manufacturing process
	Risk of technological process
	Risk, caused by growth of prices and tariffs for services of third parties
	Risk, caused by high interest rates on loans; investment risks
	Risk of investment limitation and low attraction of forest husbandry
	Risk of underdevelopment of transport infrastructure
Natural and climate risks	Risk of forest fires
	Risk, caused by weather and climate changes
	Risk of breeding of insects and forest pests
	Risk of harm dealt by wild animals
	Risk, caused by unfavorable weather conditions, windfall, flood
	Risk of increase of anthropogenous stress
	Risk, caused by long production cycle

Variety of risks in the system of forest husbandry under condition of possible climate changes is reflected in Table 2. At that, the number of complex risks, together with natural and climate, include the regulatory and law group and productive-economic group. Each complex risk, in its turn, was represented by variety of simple risks.

For purposes of the research, the special emphasis was made on the evaluation of natural and climate risks for forest-based sector of economy.

Climate warming leads to the risk of substantial loss of biodiversity (Klaptsov, 2012) due to change of reproduction cycles of animals and plants and/or migration of animals, length of vegetation period, distribution of species and size of populations, or even extinction of species in many forest regions due to reaching the warm limit of the suitable area of circulation. This relates to substitution of some tree species by other – as a rule, less valuable – reduction of net productivity of ecosystems and biomes, domination of opportunistic, "agrestal" species (IPCC Fourth Assessment Report, Climate Change, 2007; Edwards et al., 2005).

In the forests, where the main task is timber production, strong storms can create big problems of economic, ecological, and social character, and, together with fires, are, probably, the most significant and large-scale type of intrusion into product value of timber stand both in natural and administered forests. Drying-out of forests inflicts a lot of damage to forest husbandry and creates background for emergence of catastrophic forest fires (Global change of climate and its manifestations and consequences for Russia: socio-economic and ecological aspects. Review of the most significant publications in Russian, 2005).

Reduction of length of winter season due to warming leads to reduction of timber harvest period in the forest. Reduction of seasonal durability of winter roads, in its turn, leads to problems with transportation, including all-terrain transport. Consequently, it leads to significant violation of plant cover, impossibility for use of old track, and need for a new road. Except for ecological damage with soil disturbance on large territories, large financial expenses for new roads are expected.

Sporadic outbreaks of pest activity can have negative consequences for growth and length of tree life, crop yield, and quality of woody and non-woody forest products, environment of wild animals and plants, and also recreational, aesthetic, and cultural value of forests. In some cases, outbreaks of quantity of pests threaten the trade of forest products, reduce the product value of timber, and lead to loss of revenue and direct economic losses (FAO UN Global Forest Resources Assessment, 2010).

In whole, the situation can lead to reduction of forest territories with valuable tree species (Edwards et al., 2005; ACIA, Arctic Climate Impact Assessment, 2005), which will cause economic losses of raw timber exporters and consumers and difficulties for timber processing industry. The situation can lead to increase of social tension in the population employed in forest and timber processing industry.

As a result of processing of statistical information, received during expert survey of respondents, the expert evaluation of the level of risk, significance (rankings) of revealed risk factors, and values of indicators of risk factors was conducted.

It was found that the most dangerous risks for forest-based sector are natural and climate complex risks, which can be presented as variety of simple risks, caused by increase of the number, frequency, and size of natural fires in forests; increase of anthropogenous pressure and massive distribution of pests and forest diseases (Table 3).

Table 3. Critical risks in forest-based sector

Risk factor	Evaluation of factor importance (value of consequences)	Evaluation of frequency of manifestations (probability)	Final evaluation of risk
Risk, caused by increase of the number, frequency, and size of natural fires in forests	0.92	0.86	0.89
Risk of increase of anthropogenous pressure	0.96	0.80	0.88
Risk of massive distribution of pests and forest diseases	0.94	0.72	0.83

It should be noted that occurrence of above mentioned risks in the forest-based sector possesses not only critical, but sometimes catastrophic consequences.

4. Discussion

Over the last 50 years, there has been a quick increase of expenses in forest-based sector of economy, caused by extreme weather conditions. Global economic losses due to catastrophic events increased by 10.3 times, beginning from 1950s (IPCC Third Assessment Report, Climate Change, 2001).

Economic literature of recent years, devoted to problems of risk, gives the classification of risks with allocation of four spheres of their manifestation: productive, commercial, financial, and innovational (Baldin, 2006). At the same time, study of risks and their consequences in forest-based sector appears to be of great interest (Morkovina et al., 2014).

Natural forest ecosystems are especially vulnerable from the point of view of climate change. The expected climate changes can violate the stable relations between tree species at the stage of natural restoration of forests after cuttings and fires, and in the centers of forest disease and pests. Most of researchers agree that in the long-term the expected changes of temperature can lead to shift towards the north of the boundaries of climate zones. Air temperature increase and related decrease of soil moisture content will lead to gradual disappearance of boreal forests and substitution of tropical forests by savannas. There will be a tendency for substitution of plants of semiarid region by plants of arid region.

Despite the fact that consequences of climate change for forest productivity manifest themselves slowly, they will be seen after a long period of time, while some changes can be irreparable (IPCC Fourth Assessment Report , Climate Change, 2007; Williamson et al., 2009; Smith et al., 2009; Perspective research on forest-based sector of North america for 2006-2030. Geneva research on forest husbandry sector and forest industry № 29, 2012; Olsson, 2013; Olsson, 2009).

The main problems refer to the productivity of forest husbandry. Change of climate, which can lead to drying-out of forests, change of forest ecosystems, and shift of forest areas will lead to difficulties in material and technical provision of forest-based sphere and rise of expenses on all forest husbandry operations – from taxation to timber harvest and timber transportation. The making of new roads will be necessary.

Consequences of climate change will influence market sector, which will lead to change of volume, quality, and prices for timber, other products and services. The share of forest-based sector, including timber processing and production of paper and cellulose constitutes approx. 1% of the total gross product of European countries. However, as a result of above mentioned negative consequences of climate change, the situation can significantly change (State of forests in Europe by 2011/ Short review for persons making decisions, 2011; Geneva research on forest husbandry sector and forest industry № 32, 2013).

Besides, the influence on the market will be expressed in change of demand for energy products made of timber, in change of transport accessibility of forest-based sector of economy, tourism and building on the basis of raw timber, in increase of material damage and insurance loss as a result of extreme climate phenomena, in necessity for decision making regarding the location and change of location of objects of development and population, in change of need for resources, and in rise of cost of measures for adapting to the climate changes. Consequently, there will be reduction of employment in forest-based sector, aggravation of labor conditions, reduction of profitability, and decrease of employees' income.

Climate change and expected changes of events related to weather, which, as is believed, are caused by climate change, will raise the insurance uncertainty for evaluation of risk in forest-based sector and related industries.

Beliefs that some states, including Russia, will receive profits from global warming are, according to variety of scientist, not true; it is proved when taking into account local damages from accidental fluctuations of climate system and cases of extreme weather conditions, and also damages of global character.

At that it should be noted that influence of climate in economic aspects of forest husbandry could have direct and indirect character. Consequences of direct influence include real and expected changes of conditions of husbandry, determined by vulnerability of economy in whole and its certain industries to climate fluctuations. At the macro-economic level, it is manifested in change of dynamics, structure, and technological mode of economy. Indirect consequences are caused by reaction of economic system to these changes: weakening of husbandry influence on climate forcing or adaptation of main elements of economic system to new circumstances. It should be noted that changes of husbandry conditions could both aggravate the development of specific industries and territories and facilitate it (IPCC Third Assessment Report, Climate Change, 2001).

5. Conclusion

Risks and threats for economic security of forest-based sector under condition of possible climate changes were assessed with the use of content analysis. Based on the systematization and analysis of the data of literary sources and on the processing of results of survey, the main risks for economic security of forest-based sector were found which are specific for it (i.e. requiring special methods of management), and the nature of which is largely determined by the peculiarities of the sector itself.

It was found that the most dangerous risks for forest-based sector are natural and climate complex risks, which can be represented as variety of simple factors, caused by increase of burns, frequency and size of natural fires in forests; increase of anthropogenous load and massive distribution of pests and forest diseases. The conducted numerical estimates of probability and size of consequences of above mentioned factors for forest husbandry show that they lie in the interval that corresponds to the critical risk level**.**

In this situation, the task of development of conduct of measures, aimed at the easing of consequences of climate change for forest-based sector and increase of sustainability of forest plants becomes more significant. Development of the strategy for adaptation of the system of forest husbandry to possible climate changes is also important.

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Assessment and Management of Banking Risks in the Global Community: Benefits and Challenges of Implementation of Basel Standards

Kristina A. Kazakova[1], Alexander G. Knyazev[1], Oleg A. Lepekhin[1] & Ella I. Skobleva[1]

[1] Astrakhan State University, Astrakhan, Russia

Correspondence: Oleg A. Lepekhin, Chair of World Economy and Finance, Astrakhan State University, Tatischeva, 20A, 414056 Astrakhan, Russia. Tel: 79-64-889-8659. E-mail: okmb07@yandex.ru

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Abstract

Regulation of banking risks by the state is due to the specifics of banking, associated with the transformation of deposits into loans and multiform negative effects that banking risks bear to the national economy. Since the late 1980s, the international practice of assessment and management of banking risks began to be reflected in the documents of the Basel Committee on Banking Supervision. In this paper we consider the evolution of Basel standards from Basel I to Basel III, and discuss substantial features of each generation of the standards. To date, a considerable number of countries, including Russia, have joined Basel standards. The paper discusses the features of regulation of banking risks in Russia, as well as the problems faced by commercial banks and the regulator in the implementation of Basel standards in the Russian banking sector.

Keywords: risk management, banking sector, Basel standards, Basel III

1. Introduction

The problem of assessment and management of banking risks in a rapidly changing situation in the global economy, accompanied by financial instability and desire of banking entities to permanent progressive development, acquires today a global character. Banking theory and practice in today's realities needs to develop a systematic approach to the assessment and management of financial risks. Currently accepted standards of banking supervising authorities are based on assumptions about the importance of determining the level of capital that reduces the risk of bankruptcy.

In the work of Freixas and Rochet (Freixas & Rochet, 2008) is noted that financial markets are characterized by various forms of information asymmetry: ex ante (adverse selection), interim (moral hazard), and ex post (costly state verification). In determining the state policy of regulation of the banking sector the central problem is “moral hazard”, which in banking refers to the desire of owners and/or managers of banks to conduct operations with high profitability by transferring its inherent risks to the third party, who may be depositors, other creditors and the state.

By its very nature, any financial institution, when implementing procedures aimed at the prevention of banking risks, seeks to maximize the profit from operations by effective use of funds. Thus, if we talk about the level of capital adequacy, the representatives of the banking sector prefer to operate with minimum capital in order to provide growth of assets and profitability. This in turn contradicts the ideas of supervising authorities in the banking sector, who on the other hand believe that it is the high level of capital that can help to reduce the level of bankruptcies.

The increasing complexity of banking activities, the emergence of new risks faced by banks in their operations, the rapid changes in the environment - all of this requires constant revision of approaches to assessment of the level of capital adequacy. It is important to note that activities of many large banking institutions have today an international character, which in turn explains the need to establish common standards for capital and methods of its estimation. The development of relevant standards is carried out by the Basel Committee on Banking Supervision (BCBS). The result of its work is the adoption of agreements, which regulate the procedure of capital adequacy assessment of commercial banks.

2. Materials

Since the early 1980s the problem of banks' capital adequacy and assessment methodology was the subject of lively debate in the international financial institutions. Interest of regulators to bank capital is due to the fact that it performs the function of protection of depositors from possible losses. The size of the bank's capital is a key factor in the confidence of depositors and clients of the bank's ability to compensate for losses. As a result, the concept of a minimum level of capital adequacy has been proposed.

In July 1988 G-10 (the Group of Ten) countries adopted a common approach to capital adequacy, developed by the Basel Committee on Banking Supervision, which became known as the Basel Capital Accord of 1988 (BCBS, July 1988).

This agreement, known as Basel I, and the subsequent documents of the Basel Committee, regulating the assessment and management of risks, formed the information base of this article. In addition, regulations of the Bank of Russia (instructions, manuals, etc.), publications of scientific and business community were used.

3. Results

At present, a large number of studies has appeared assessing the impact of the established, by banking supervisory authorities, requirements for the capital adequacy and the reserve fund for unforeseen losses. Among these, we should mention impact studies of the Basel Committee which reflect the timeline of all changes in the adopted texts of agreements, as well as evaluate the effectiveness of their implementation in banking activities (for example, BCBS, April 1988).

In (Akhtaruzzaman, 2009) the author evaluates the effects of the introduction of international standards for capital adequacy requirements, and carries out a comparative analysis of the requirements of Basel I and Basel II. The author concludes that the introduction of the latest techniques increases capital requirements almost twice.

Russian publications on standards, developed by the Basel Committee on Banking Supervision, are mostly descriptive. A number of studies reveal main aspects of Basel standards (Astrelina, 2005), analyze some approaches, proposed in the BCBS documents, for example, assessment of operational or credit risks (Zolotarev, 2005), discuss the possibility of implementation of new standards in Russian banks (Tysyachnikova, 2008).

Despite the large number of studies, the effectiveness of the Basel directives in terms of flexibility of methods for assessment and management of bank risks remains open today. In the modern era of globalization accompanied by financial and economic instability, it is essential to identify the problems of introducing common standards and to identify ways to address them in order to develop an effective mechanism for prevention of financial risks in the banking business.

In the generally accepted standards, developed by the Basel Committee on Banking Supervision, you can trace the evolution of capital adequacy requirements aimed to prevent financial losses. Thus, Basel I, adopted in 1988, introduced in banking practice the principle of calculating capital adequacy ratio, which was based on structuring capital into Tier I (core) and Tier II capital. Permanent shareholder’s equity, as well as all the disclosed reserves, including retained profit and reserves to cover unexpected losses, were referred to Tier I capital, while Tier II capital included more doubtful elements of the capital, such as undisclosed reserves, revaluation reserves and subordinated term debt.

Capital adequacy was assessed by a weighted risk ratio in which capital is related to different categories of assets or off-balance-sheet exposure, weighted according to broad categories of relative riskiness (Basle Committee on Banking Supervision, July 1988). It was decided to differentiate all the assets on the degree of exposure into five groups, for which have been identified certain weighting values: 0, 10, 20, 50 and 100 - the higher the risk, the greater the weight. On the one hand, it has allowed to differentiate between capital requirements for banks with different structure of assets. However, the simplified nominal scale did not allow to exactly define the required level of capital adequacy.

Due to its simplified approach and low sensitivity to the gradations of risk, the standard methodology of the Basel Committee became an object of criticism from the banking community. A significant drawback, for example, was the assignment of all corporate loans regardless of their credit quality to the assets with a 100% risk. As a result, lending to a borrower with the highest AAA rating could require the same volume of the reserved capital as loans to venture funds.

The new Basel Capital Accord, so-called Basel II Capital Accord, which came into force only in 2006, was published in 2004. The main objectives of Basel II were to introduce into banking practices such innovations as stimulation of banking institutions to continually improve their techniques and procedures for risk assessment

and management, the urge for flexible and precise risk assessment, in particular through the inclusion of operational risk, the desire to reduce the gap between the minimum requirements for capital adequacy and economic evaluation of banking capital requirements.

Basel II (BCBS, June 2006), which is a more detailed document than Basel I, included such components as:

- minimum capital requirements, which differed in the complexity of approaches to the calculation of capital reserved against the relevant types of risk - credit, market or operational;
- monitoring procedures that involve certain principles of control by the regulatory authorities for capital adequacy and banks' risk assessment systems;
- market discipline, which strengthened disclosure requirements about the risks and the capital of banking institutions.

It should be noted that, as in the first document of the Basel Committee on Banking Supervision, the basic indicator variable of Basel II was the capital adequacy ratio, which recommended value was left unchanged at 8%. The innovative features in the Basel II standard were new methods of assessment of various types of risks. For example, for credit risk assessment banking entities were proposed to use such options as the standardised approach and the internal ratings-based (IRB) approach. In the case of the standardised approach the methodology of Basel I was used, with the difference that assets were weighted by risk, depending on the credit rating assigned by external credit assessment institution. When using the approach based on internal ratings, risk assessment of assets was carried out via bank's internal rating model, which should be previously approved by the supervising authority.

It is important to note that an improved mechanism for calculating the minimum capital adequacy ratio, provided for Basel II, was supplemented by a system of supervision and cooperation between banks and supervisory authorities, as well as an extensive system of disclosure.

Table 1. Terms of global implementation of Basel III

	2011	2012	2013	2014	2015	2016	2017	2018	As of 1 January 2019
Minimum Common Equity Capital Ratio			3.5%	4%	4.5%	4.5%	4.5%	4.5%	4.5%
Capital Conservation Buffer						0.625%	1.25%	1.875%	2.5%
Minimum common equity plus capital conservation buffer			3.5%	4%	4.5%	5.125%	5.75%	6.375%	7%
Minimum Tier 1 Capital			4.5%	5.5%	6%	6%	6%	6%	6%
Minimum Total Capital			8%	8%	8%	8%	8%	8%	8%
Minimum Total Capital plus conservation buffer			8%	8%	8%	8.625%	9.25%	9.875%	10.5%
Capital instruments that no longer qualify as non-core Tier 1 capital or Tier 2 capital			Phased out over 10 year horizon beginning 2013						
Liquidity coverage ratio	Observation period begins				Introduce minimum standard				
Net stable funding ratio	Observation period begins							Introduce minimum standard	
Leverage Ratio	Supervisory monitoring		Parallel run 1 Jan 2013 – 1 Jan 2017 Disclosure starts 1 Jan 2015					Migration to Pillar 1	

Source: Basel Committee on Banking Supervision, December 2010. "Basel III: A global regulatory framework for more resilient banks and banking systems".

Basel III, adopted in December 2010 (BCBS, December 2010), has emerged as a reaction to the global financial crisis of 2008, which in turn threatened the capital adequacy of most banking institutions. Numerous write-offs

of bad loans were recorded as a loss of the corresponding period and reduced the amount of capital of credit institutions. In this regard, in order to maintain a sufficient amount of capital of commercial banks, governments and central banks were induced to provide banking sector with subordinated loans, which are eligible for inclusion in the capital base. According to the requirements in respect of capital, Basel III discussed such innovations as changes in the structure of banks' equity capital, increased capital requirements of the institution, as well as the creation of additional capital buffers (BCBS, September 2010).

According to the new standard, the main measure of the effectiveness of bank capital should be the possibility of its appropriate use for compensation for financial losses. Basel III thus revised capital structure, namely proposed to exclude from equity a number of elements, which are not sufficiently liquid and can not be used to cover the losses. It is important to note that the Basel III in respect of the calculation of capital adequacy does not make any changes, but only increases minimum levels of a number of ratios. For example, minimum Tier 1 capital was set at 6%.

In addition to the above, the Basel III proposed a phased introduction of the two capital buffers: capital conservation buffer and countercyclical buffer. Creating a conservation buffer implies the formation of a reserve stock of capital in the amount of 2.5% of the risk which should be maintained by the bank. Countercyclical buffer is aimed to contain the credit activity of banks in times of economic recovery and stimulate it in times of recession.

The question of the flexibility of the Basel directives was raised repeatedly. The main reason for this, of course, is the difficulty of adaptation of the features of banking structures of emerging markets economies to international standards in the field of banking supervision and control. Introduction of international financial risk assessment and management standards to the Russian banking theory and practice is also ambiguous.

The Russian banking practice today is trying to introduce comparable with the characteristics of the existing banking system regulations of Basel II. The requirement to maintain market discipline is met: banking institutions disclose basic information about the capital adequacy on official sources.

Table 2. Terms of implementation of Basel III in Russia

	2011	2012	2013	2014	2015	2016	2017	2018	As of 1 January 2019
Minimum Common Equity Capital Ratio				5%	5%	5%	5%	5%	5%
Capital Conservation Buffer						0.625%	1.25%	1.875%	2.5%
Minimum Tier 1 Capital				5.5%	6%	6%	6%	6%	6%
Liquidity coverage ratio	Observation period begins				Introduce minimum standard				
Net stable funding ratio	Observation period begins							Introduce minimum standard	
Leverage Ratio	Supervisory monitoring				Parallel run 1 Jan 2013 – 1 Jan 2017 Disclosure starts 1 Jan 2015			Introduce minimum standard	

Source: Central Bank of Russia, 2011. “Banking sector development strategy of the Russian Federation for the period up to 2015”, press-releases of Central Bank of Russia.

In April 2011, the Russian Government and the Bank of Russia issued a joint statement on the banking sector development strategy of the Russian Federation for the period up to 2015. Appendix 1 of this application is fully dedicated to the direction and timing of the implementation of the Basel II and Basel III standards in Russia. However, the subsequent implementation of the Basel standards required an adjustment of the time frame, as was noted in the press release of the Bank of Russia (Table 2).

Regulation adopted by the Bank of Russia of 26.03.2004 № 254-P “On the order of formation of reserves for possible losses on loans by credit organizations” (the Bank of Russia, 2004) was to a certain extent the first

attempt in the direction of approaching the requirements of Basel I. Guided by this document, the banking practice in order to determine the estimated amount of provision classifies all loans into appropriate quality categories - standard, substandard, doubtful, problem, uncollectable, - each of which is characterized by a certain level of its depreciation - 0%, 1-20%, 21-50 %, 51-100%, 100%, respectively. The main disadvantage of this regulation is ranking on a nominal scale, accompanied by vague recommendations on the formation of reserve funds for the various categories of loans. On the example of the category of "doubtful loans" it is easy to see that the estimated range of depreciation of issued loan is in the interval of 21 to 50%, leading to some uncertainty as to the required size of the reserve. . It is important to emphasize that the prevention of credit risk in excess of the required allocations to the reserve fund not only provides the irrationality of banking activities, the main purpose of which is to maximize profits, but also reduces the effective rate of placement because of the additional allocations to the reserve fund of the loan. This in turn gives rise to the base interest rate risk associated with the uncertainty of future profitability of the banking portfolio (Sevruk, 2010).

As part of the implementation of the standardised approach to risk assessment in 2012, the Central Bank of Russia has approved the Regulations on mandatory ratios of banks (the Bank of Russia, 2012), which sets numerical values and methodology for calculating capital adequacy, liquidity, maximum risk per borrower or group of related borrowers, and other mandatory ratios banks. The weighting factors underlying the calculation methodology, are established by the regulator on several large groups of loans, they are the same for all banks and equally applied to all loans within the same group regardless of the level of risk an individual asset.

It is important to note that today, the majority of banking institutions in Russia and a considerable number of their large corporate clients do not have ratings by international agencies that spontaneously increases the requirements for the formation of bank capital and thereby limits the ability of the banking sector to expand the scope of its activities.

At the same time we should not forget that Basel II provides alternative methods of calculating the amount of credit risk on the basis of internal ratings, allowing banking institutions to independently assess credit risk. When using the above mentioned approach banking institutions are provided with the possibility of introducing their own internal statistical models and risk assessment systems which allow to determine the probability of default (PD) of the borrower, the level of loss given default (LGD), the exposure at default (EAD), and if necessary, effective maturity (M). As a consequence, the implementation of appropriate methodologies gives banks the opportunity to fully manage their risks and to consider them when calculating capital adequacy.

To date, the Russian banking practice begins to actively take actions in the direction of the transition from the standardised approach to credit risk and capital adequacy to advanced IRB methods. In 2012, the Central Bank of Russia published guidelines for the implementation of the approach to the assessment of credit risk based on banks' internal ratings (the Bank of Russia, December 2012). In early 2014 the Bank of Russia published draft Regulation "On the procedure for assessment the value of the credit risk based on internal ratings" (the Bank of Russia, February 2014a) and the Directive "On the order of consideration of applications of banks on the use of an IRB approach to credit risk assessment" (the Bank of the Russian Federation, February 2014b). Developed to implement appropriate standards of Basel II in Russia, these projects mainly determine the order of the transition of Russian banks on the advanced approach to the assessment and management of credit risk and describe minimum requirements for banking institutions wishing to calculate capital requirements based on these techniques.

For the implementation of credit risk assessment based on internal ratings, banks will need to obtain permission of the Bank of Russia, which will be issued by the regulator as a result of detailed checks on compliance with the minimum quantitative and qualitative requirements specified in the relevant project. It is important to note that for the submission of the application, there is a specific list of requirements, including: the size of the bank's assets should be more than 500 billion rubles, at the time of submission of the application banking institution should practice an appropriate approach in accordance with the requirements of the Bank of Russia at least two years, as well as should be presented an analysis assessing the impact of the transition to the level of capital adequacy.

4. Discussion

Despite the expected benefits from the implementation of the above-mentioned requirements of Basel II, the transition to the new standards involves significant time and financial costs. To create an integrated risk management system and eliminate existing inconsistencies banks will require significant investment in the development of new methodologies and tools, as well as staff training and reorganization of internal processes. Banks operating in developed markets, over a long period of time have been investing in the development and

modernization of risk management systems. Over the years they have accumulated detailed statistics and have arranged the process of calculating capital.

Today in Russia, most financial institutions still do not have such an experience, and so the process of submission of the application and preparation for the implementation of the Basel regulations require them to solve a specific problem. It is important to understand that the use of quantitative methods of bank risks is based on the construction of mathematical models, which in turn allow us to determine the probability of crisis events, and requires a great deal of information provision. The main problem in creating such models for the Russian banking practice is insufficient and sometimes complete lack of any historical data for the respective characteristics of transactions and customers. In this case, the general statistics sometimes also does not exist or they are not applicable in connection with the specific features of the bank or lending policies. However, these difficulties should not become a stumbling block to the creation and implementation of quantitative methods for assessing credit risks. At the initial stage they can use data that have been publicly disclosed, allowing one hand to take the first step towards the development of these techniques, and on the other - to understand what data are needed to further improve and refine models, created in the first approximation.

5. Conclusion

Implementation of the recommendations of the Basel is a relevant way to increase the stability of the banking sector. The Bank of Russia conducts in this direction consistent and systematic work.

A promising direction is the implementation of the internal ratings-based approach, which is based on internal assessments of their borrowers by banks and not on the opinions of rating agencies. Potentially, this approach can significantly reduce the estimate of risk weighted assets, and thereby facilitate satisfaction of the restrictions imposed on the capital adequacy ratio.

At the heart of an advanced approach based on internal ratings, is the notion of probability of default (PD). The world's leading rating agencies (for example, Standard & Poor's and Moody's) formed a database of defaults on European and American markets. In Russia, there is almost no such information (except for information about individuals defaults that have been accumulated since the establishment of the Central Catalogue of Credit Histories in 2004), that’s why an objective assessment of PD is extremely difficult. Statistical information accumulated in Russian banks is distorted, firstly because of the large statistical error due to the fact that defaults of legal entities are quite rare, and secondly, there is a pre-selection of potential borrowers on the level of credit units, by preliminary analysis of documents, interviews with customers, and often personal relationships. Thus, the frequency of credit default among banks’ clients is not equivalent to the frequency of default of all potential borrowers.

Therefore, for the implementation of IRB-approach banks need access to a database containing a statistically valid information on historical frequencies of default of different categories of borrowers. Information for such database may be provided by the Federal Tax Service: information about outlawed companies, and tax debtors, as well as the operating companies grouped by industry (sectorial areas of activity), by turnover, by assets and etc. The organizer of the creation of such a database could be the Bank of Russia.

Stress-testing initiative of Russian banks could also contribute to the stability of the Russian banking sector. The position on the need for stress tests already contained in Basel II. Illustrative results of interconnection between key macroeconomic and, for example, corporate indicators are a reliable guide in the refinement of the bank's strategy on the market of targeted products and services. The use of economic and mathematical models of the new generation, based on copula functions, should provide an effective implementation of stress testing. Copulas allow to simulate non-Gaussian distributions of financial risks when the approach, based on the linear correlation, is inadequate. In 2009, the Basel Committee on Banking Supervision noted that copulas are one of the most correct way to assess financial risks (BCBS, 2009).

Yet attempts to fulfil a plan for the implementation of Basel-II/III in Russia have encountered difficulties associated with the need of restructuring the system of quality assessment and risk management in banks.

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Educational Strategy as a Form of Economic Behaviour

Ella I. Skobleva[1], Elena P. Federova[1] & Aleksandr P. Lunev[1]

[1] Astrakhan State University, Astrakhan, Russia

Correspondence: Ella I. Skobleva, Astrakhan State University. 20a Tatishchev Street, Astrakhan, 414056, Russia. Tel: 7-851-249-4156. E-mail: skobleva@mail.ru

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Abstract

The article analyzes educational strategies of the graduates who are planning to enter a master programme after completion of their bachelor programme. The research sets the goals to establish the main reasons for getting education in a master programme and factors defining their readiness to pay for this education. The research was carried out on the basis of Astrakhan State University (the Russian Federation). The research suggests a simple econometric model of component analysis. The result shows that most of the students consider a master programme to be a feasible educational trajectory, however only a minor part of them are ready to study on a commercial basis. Formation of a particular educational strategy is directly connected with the expected future income. It is characteristic that those bachelor degree graduates who are career-oriented display willingness to pay for their education, and those who see their professional future in enhancement their knowledge and being engaged in some research work expect to continue their education at the expense of the state. The results of the research confirm the existence of the investment, signaling and consumer functions of education that influence the preferences of the students and the choice of their further educational strategy.

Keywords: economics of education, educational strategy, human capital, master programme, preferences

1. Introduction

The global trend of the higher education development today is the dissemination of the Anglo-Saxon model of two-level training of specialists in different spheres of knowledge and professional activity. The first level of education in this model corresponds to acquisition of a bachelor degree, and the second level – a master degree. The most convincing evidences of dissemination of the two-level system are two key integration processes: the Bologna declaration signed in 1999 and the Lisbon Strategy 2000. The Bologna declaration had the main purpose of creating an integrated higher education area in Europe by means of introduction of standardized multilevel system of academic degrees for all the European countries. The Lisbon strategy reflected the Europe's aspiration to have a dynamically developing knowledge-based economy that would be competitive at the global level. Specialists consider that in the current system dynamics the key role is played by the reforms connected specifically with the transition to the multilevel system of degrees. (Maassen & Stensaker, 2011). In the countries adopted the two-level training system, bachelors are seen as the specialists that compose the bulk of the employees with the higher education in all the spheres of economy. Masters are primarily engaged in research and design engineering, teaching in higher education establishments which in most countries presupposes carrying out some scientific research. We should also note that actually three academic degrees are accepted: bachelor, master and doctor. The latter is awarded for the achievements in science.

The statistics shows that 58% of young adults in OECD countries will enter tertiary-type A (Note 1) programmes during their lifetime; the proportion of students entering tertiary-type B (Note 2) programmes is generally smaller, mainly because these programmes are less developed in most OECD countries. An average of 18% of today's young adults (20% of women and 17% of men) will enter tertiary-type B (shorter and largely vocational) programmes over their lifetime (Education at a Glance, 2014). The data on the Russian Federation display that in 2012 the share of students willing to take a master degree course was more than 35% which is more than the average share in OECD countries (Figure 1).

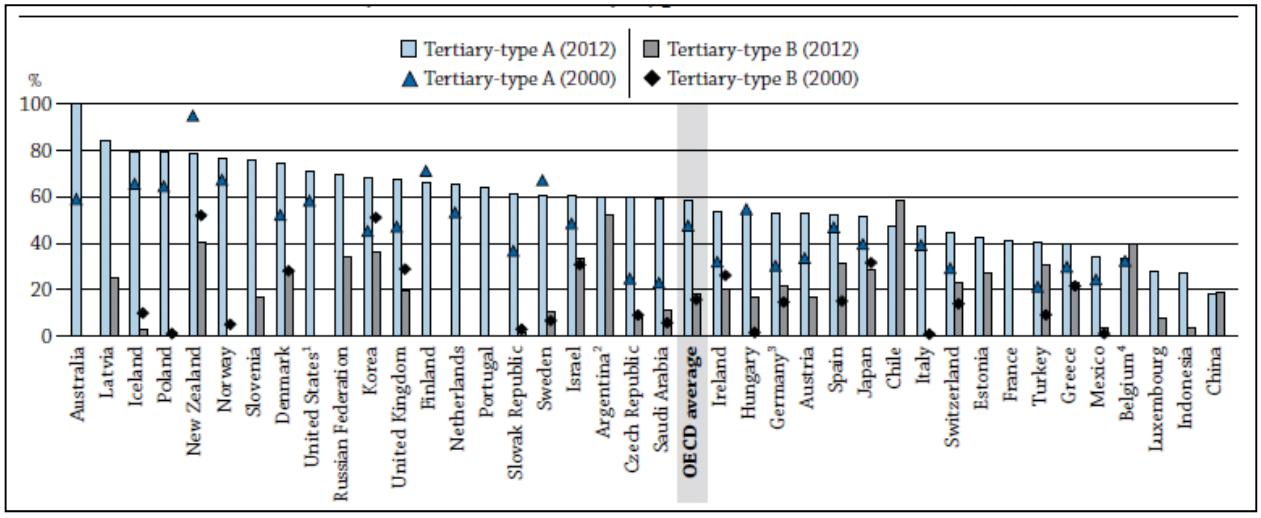

Figure 1. Entry rate into tertiary-type A and B education (2000, 2012)
Source: Education at a Glance 2014: OECD Indicators

The diagram shows that on average across all OECD countries with comparable data, the proportion of young adults who entered tertiary type A programmes increased by 10 percentage points between 2000 and 2012, and by almost 20 percentage points between 1995 and 2012. Among OECD countries, overall net entry rates into tertiary-type B programmes between 2000 and 2012 have remained relatively stable (Education at a Glance, 2014). There are no data on the Russian Federation in the diagram. But this can be explained.

Russia joined the Bologna process in 2003 and this predetermined the transition of Russian higher education to the two-level system – bachelor degree programme (first level) and master degree programme (second level).

During the recent years the interest to these fundamental transformations from the part of the stakeholders of higher education – state, students, employers, academic community - grew one day and faded away another. The heated debates of 2005-2007 covered a wide range of topics: from philosophical and organization-and-management aspects to the technical mechanisms of bringing the higher education system into accordance with the principles of multilevel organization (Telegina & Schwengel, 2012)

Today in Russia the topical issues are the ones related to the dynamics and mechanisms of implementation of the master degree education, demand for masters at the labour market, value of the master degree education for those who are interested in it.

Intensive launching of master degree programmes in Russian universities took place in 2007-2010. Since 2011 the master degree programmes have been implemented in compliance with the Federal State Educational Standards of the third generation. The State Programme “Education Development 2013-2020”, adopted at the end of 2012, defines the consistent increase of the number of students in master programmes as one of the vectors of the development of the national educational system. Table 1 displays an increase of the estimated figures of citizens admitted to master degree programmes to study at the expense of the federal budget (Ministry of Science and Education of the Russian Federation, Centre for State Assignment and State Recording, 2015).

Table 1. Estimated figures of enrollment to master programmes in the Russian Federation in the period from 2011 to 2015

	2011	2012	2013	2014	2015
Estimated figures of admissions to master programmes, number of people	53167	62053	74454	75706	172565

The data of the table also show that in 2015 the number of state-funded places for admission to master degree programmes rose sharply. The reason is that 2015 was the year of graduation for those students who had entered

bachelor programmes in 2011in great numbers. At the same time the question arises to which extent the bachelor programmes graduates are ready to continue their education in master programmes and what their incentives are.

Master degree education itself presupposes the process and result of acquiring a certain specialized master programme, aiming to develop professional, personal features, to form research competences in professional activity. Master education must be characterized by flexibility of the professional training manifesting itself in advanced and prompt response to the demands of the society; the society must have a clear idea of masters as professionals. At the same time no regulation has been elaborated to distinguish which qualification and set of professional competences a graduate should possess to hold a certain job. Career-service portals present no requirements to the posts to be held by master graduates, neither are determined the jobs appropriate for this level of education. This means that masters have no real advantages in employment, it is too early to speak about any dependence of the salary level on the level of the education obtained.

Alongside with that young people today not only get higher education, but form their own educational strategy, orienting to their preferences, changes in the labour market, possibilities of the educational area.

Studying of educational strategies, preferences related to the goals of education acquisition becomes urgent because the sphere of education is an area of strategic behavior of social groups. When regarding the master programme as an object, at which one or another educational strategy is aimed, we should resort to the concept of educational strategy as itself.

In scientific papers term "educational strategy" is interpreted differently. In the whole the definition of the notion is based on general features of strategy. You cannot find the only right way to create a strategy (Mintzberg, Ahlstrand, & Lampel, 2001). Strategy is often understood as a unique line of action, which enables the person who is making decision to make choice any moment taking into consideration all the information (Mushik & Muller, 1990). The strategy necessary to implement the chosen plan of actions presents a general programme as well as distribution of priorities and resources to the benefit of achieving ambitious aims (Kunts & Odonnel, 1988).

When defining the content of notion "educational strategy" one should remember that strategy is a multilayer phenomenon. The question is which element of the strategy is necessary to register some strategic behaviour. We suppose that strategic decision (or strategic choice as a result of decision) can be the central element of strategy. Its presence allows registering the strategy, besides strategic decision witnesses about the existence of a long-term goal, willingness to implement it and readiness to take certain measures to achieve it. G. Crow giving the definition of strategy writes that "this means deliberate and rational decisions related to a long-term prospective" (Crow, 1989).

Making a strategic decision is predetermined with existence of an ambiguous situation which requires the subject to make some choice from a number of alternatives. Making strategic decisions can be understood as negotiating of contradictions between intensions of a person and life circumstances (Abulhanova-Slavskaja, 1991).

To separate strategic behaviour in the sphere of education from occasional fragmentary behaviour practices one should bear in mind that educational strategy is a coherent line of behaviour and is a result of the strategic decision, choice made by the student. Many authors accentuate this specificity of educational strategy. For example, Kharchenko I. notes that educational strategy is the young generation's choice of the way to get professional education and implement certain behaviour patterns in the sphere of education (Kharchenko, 2007). According to Maksimova M. educational strategy is a sequence of choices of the forms and means to get higher education (Maksimova, 2007). Van Damme D. thinks that "educational strategies direct the decision making process due to generating pragmatic and rational responses to arising challenges and problems" (Van Damme, 2000).

A number of researches stress that such decisions can be made several times. Gradoselskaja G. defines educational strategy in this way, noting that at different stages of education individuals make their choices, develop their strategies of getting education depending on different factors (Gradoselskaja, 2004). Bajdakova N. and Lapina L. found out that level of parents' education, their social status, level of the family's income, place of living, sex are the most essential social and economic factors influencing an individual educational strategy (Bajdakova & Lapina, 2014). A group of researchers from the Research Institute of Higher School of Economics note that incentives to obtain a master's diploma, unlike a specialist's diploma, are more definite and are closely linked with three notions – quality, employment, prestige (Baranova, Muratova, Ovchinnikova, 2006).

Any educational trajectory cannot but be in compliance with the concept of rational behaviour of an "economic" person. This means that when making decision on investing money into education students and their parents

compare the expected marginal rate of return to such investments with profitability of alternate investments (deposit percentage, dividends from securities, etc) (Becker, 1975). Representatives of different social groups use educational strategies to identify their position in economic and social space. According to Bourdieu P., "educational strategies are very long-term investments", however "it is not always the case that they are treated like that and are not reduced to economic or monetary dimension, contrary to the idea of the economics of "human capital". Bourdieu P. suggests that the strategies are aimed to "bring up social agents who are worth and capable of inheriting the features of their group" (Bourdieu, 2005). There is a viewpoint, though quite a disputable one, that, as a rule, a university vests its graduates, apart from special training, with a certain resource of university's competencies. In the labour market this resource provides for exchange of the university diploma for other specialized knowledge, which is beyond the specialization of training, but which appears equivalent to level of qualification of the acquired higher education (Cherednichenko, 2014). Anyway the concept of implementation of educational strategies is directly connected with economic incentives.

Having analyzed the usage of term "strategy" in the context of studying of people's economic behaviour we can suggest the following definition of term "educational strategy". This is a system of a student's economic behaviour expressed in using of the means of educational milieu to achieve prospective educational goals and to find ways of income maximization.

2. Method

To identify the factors defining the students' educational strategies we used multidimensional analysis methods, in particular methods of factor analysis. The aim of the factor analysis is to define on the basis of real data implicit generalized characteristics that influence the subject's behaviour.

The main goals of the factor analysis are:

1) dimension reduction;

2) defining the structure of interrelations between the variables;

3) indirect assessment of features that are hard to measure;

4) transformation of data for interpretation.

In the work we used a special case of factor analysis – method of principal components. Its peculiarity is that principal components have a zero-order correlation between each other, as a result we have a possibility to define implicit regularities which do exist, but cannot be measured directly and which are conditioned by both internal and external reasons.

The model of the component analysis has the following formula:

$$Z_{ij} = \sum_{v=1}^{k} a_{jv} f_{iv} \ , \quad (1)$$

where a_{jv} – "weight", the factor loading of v-th principal component on j-th variable;

f_{iv} – value of v-th principal component for i-th observer, where v=1,2,…,

Zij – factor loadings matrix.

Before analyzing the data we select the factors that have a direct influence on the students' educational strategies, connected with the master programme. Initially the following factors were selected on the basis of the previous researches (Gradoselskaja, 2004; Bajdakova & Lapina, 2014; Baranova, Muratova, & Ovchinnikova, 2006):

X1 – decisions on entering a master programme

X2 – decisions on combining work and studies

X3 – incentive of enhancement knowledge of the profession

X4 – incentive of choosing a speciality different from the higher education

X5 – incentive of distrust to the level of the bachelor degree

X6 – incentive of getting a well-paid job

X7 – incentive of research activity in master programme

X8 – incentive of acquiring of practical skills

X9 – incentive - student's being forced by parents to study in a master programme

X10- readiness to pay for the training in a master programme

X11 – sex

We can presume that each of the factors influences the preferences and decisions of the students in respect of choosing their further educational strategy.

3. Results

3.1 Description of the Data

The research carried out from February 16 to February 24, 2013 was used as empiric material to underlie the article. The sample was elaborated as a multistage stratified cluster quota one. 270 students of the 4th year of the bachelor programmes of Astrakhan State University were asked to fill in a questionnaire. This amounted to 24% of the total number of the 4th year bachelor students. Students of 10 faculties took part in the survey.

The survey showed that majority of the students were going to get a master degree diploma (table 2) (80.2% against 19.2% of those who think the bachelor diploma is sufficient).

Table 2. Dependence of decisions on entering a master programme on the faculty

Faculty	Are you going to enter a master programme after completion of your bachelor course?	
	Yes	No
Faculty of Physics and Technology	88.9	11.1
Faculty of Philology and Journalism	43.8	56.3
Faculty of Chemistry	92.9	7.1
Faculty of Social Communications	80.0	20.0
Faculty of Global Economics and Management	90.9	9.1
Faculty of Psychology	78.6	21.4
Faculty of Pedagogy, Social Work and Physical Culture	71,4	28,6
Faculty of History	95.5	4.5

Students of the Faculty of Chemistry turned out to be the most motivated ones in getting a master's diploma – 92.9%, followed by the Faculty of Global Economics and Management – 90.9%. Students of the Faculty of Philology and Journalism displayed the least degree of interest in a master's diploma – 43.8%. Such discrepancies can be caused by different level of awareness of the master programmes at the faculties or by the subjective estimation of the labour market trends and different degrees of satisfaction with the obtained education. The aggregative reasons form the preferences of the bachelors concerning formation of their further educational strategy.

The proportion of the students who make decision to combine work with study in a master programme against those who prefer study to work is 92.4% against 7.6% respectively (Table 3).

Table 3. Decisions of the students in respect of combining work with study

	Options*	%
1.	Plan to combine work with study	92.4
2.	Do not plan to combine work with study	7.6

The desire of the majority of students to work while studying in a master programme can be explained by three reasons:

1) they will have a bachelor's diploma already and thus will be able to find a better-paid job;

2) willingness to get some work experience;

3) flexible schedule of the study process enabling them to combine work with study (students of master programmes usually have classes in the evenings).

An important issue of our research is the goals of students' entering a master programme. Answering it allows defining the main incentives of the students. The results of the respondents' interview are presented in Table 4.

Table 4. Goals of the further education in a master programme

	Goal of the further education in a master programme	%
1.	I want to deepen my knowledge of the profession	16.5
2.	I want to choose a speciality different from my higher education qualification	12.7
3.	Bachelor programme is the first and insufficient level of higher education	24.0
4.	Studying in a master programme is a way to find a better-paid job later	25.3
5	I am interested in research activity in the master programme	4.3
6.	I expect to acquire some practical skills in the master programme	11.8
7.	My parents force me to continue training	4.6
8.	Other reason	0.8

According to Table 4 the most popular incentives to choose studying in a master programme are:

1) incentive of finding a well-paid job or occupying a post with a high level of salary (25.3%);
2) incentive related to the fact that Russian labour market does not acknowledge bachelor's diploma (students think that employers do not consider a bachelor's diploma to be a diploma of complete higher education and thus want to deepen their knowledge of the profession studying in a master programme (24.0% and 16.5%)).

Goals and incentives of studying are connected with the issue of the students' readiness to pay for the education in a master programme (Table 5).

Table 5. Readiness of students from different faculties to study in a master programme on a commercial basis, %

Faculty	Readiness to study in a master programme on a commercial basis	
	Ready to study	Not ready to study
Faculty of Physics and Technology	20.8	79.2
Faculty of Philology and Journalism	57.1	42.9
Faculty of Chemistry	7.7	92.3
Faculty of History	25.0	75.0
Faculty of Social Communications	12.5	87.5
Faculty of Architecture and Design	25.0	75.0
Faculty of Business and Economics	50.0	50.0
Faculty of Global Economics and Management	40.0	60.0
Faculty of Psychology	36.4	63.6
Faculty of Pedagogy, Social Work and Physical Culture	40.0	60.0
Total	27.9	72.1

The survey shows that most of the students are not ready to study in a master programme on a commercial basis (72.1% against 27.9%). The majority of the students who are ready to pay for the education in a master

programme study at the Faculty of Philology and Journalism – 57.1%; at the Faculty of Business and Economics – 50%; at the Faculty of Global Economics and Management and Faculty of Pedagogy, Social Work and Physical Culture – 40% each. Probably the students of these faculties consider training in a master programme as their investment to their future and in this respect have a chance to get higher dividends from that training. It should be notes that the Faculty of Philology and Journalism has the least number of students willing to continue their education in a master programme in comparison with the other faculties, but it is they who demonstrate readiness to study on a commercial basis.

3.2 Results of the Correlation Analysis

The main goal of the correlation analysis is to estimate the correlation matrix of the general population on the sample and to define partial and multiple correlation coefficients and determination of the estimation on its basis. Correlation analysis enables to process statistics data aiming to measure the correlation ratio between two and more variables. The result of the above mentioned factors are given in Table 6.

Table 6. Correlation of the factors

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
X1	1.000	.885***	.385***	.350***	.497***	518***	.168**	.321***	-.198	-.615***	-.074
X2	.885***	1.000	.422***	.286***	.430***	.470***	.137**	.262***	.206	.821***	.038
X3	.385***	.422***	1.000	-.131	.004	.205***	.089	.222**	-.021	.334***	.210**
X4	.350***	.286***	-.131	1.000	.091	.273***	-.034	.097	.062	.311***	.102
X5	.497***	.430***	.004	.091	1.000	.090	.092	.177	.083	.476***	.007
X6	.518***	.470***	.205***	.273***	.090	1.000	.082	.193	.071	.478***	.146
X7	.168**	.137**	.089	-.034	.092	.082	1.000	.289***	-.061	.193	.086
X8	.321***	.262***	.222**	.097	.177	.193	.289***	1.000	-.050	.319***	.028
X9	-.198	.206	-.021	.062	.083	.071	-.061	-.050	1.000	.130	.069
X10	-.615***	.821***	.334***	.311***	.476***	.478***	.193	.319***	.130	1.000	.095
X11	-.074	.038	.210**	.102	.007	.146	.086	.028	.069	.095	1.000

** significance level 0.05

*** significance level 0.01

According to correlation matrix (Table 6) the correlations reaches the level of 0.01 between the decisions on entering a master programme and:

decisions on possibilities to combine work with study (positive dependence);

incentive of enhancement the knowledge of the profession (positive dependence);

incentive of changing the speciality (positive dependence);

incentive of distrust to the level of the bachelor degree (positive dependence);

incentive of getting a well-paid job (positive dependence);

incentive of acquiring practical skills (positive dependence);

readiness to pay for the training in a master programme (negative dependence).

The incentive of the parents' enforcement was of low significance for the students while making the decision on studying in a master's programme, thus displaying a high level of independence while making decision on the professional and carrier future.

The factors enumerated above, except the student's sex, were significant at the level of the students' making decision on combining work with study. However the most distinctive and positive correlation (0,821***) was the one between the incentive of studying on a commercial basis and decision on combining work with study.

When students were making decision on studying at their own account the following factors had the level of significance equal to 0.01: possibilities to combine work with study (positive dependence), incentive of

enhancement the knowledge of the profession (positive dependence), incentive of changing the speciality (positive dependence), incentive of distrust to the level of the bachelor degree (positive dependence), incentive of getting a well-paid job (positive dependence), incentive of acquiring practical skills (positive dependence).

It should be noted that the intercorrelated factors are quite numerous, however there is no multicollinearity between the factors-incentives. Incentive related to the parents' enforcement, as well as the one of sex, turned out to be insignificant.

3.3 Results of the Factor Analysis (Method of Principal Components)

To make a pictural pattern, eliminating the insignificant factors and preserving maximum of information and structure of the initial data, we apply a component analysis. As it was already noted above, the peculiarity of this analysis is that the principal components have a zero-order correlation and thus it is possible to define the implicit, indirect, but still existing regularities.

For the analysis we choose all the 11 factors which have probable influence on the students' decision on entering a master programme and on their readiness to study on a commercial basis.

The component analysis gave the following results of total and explained variance (Table 7):

Table 7. Results of total and explained variance

Component	Initial eigenvalue			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.880	35.271	35.271	3.880	35.271	35.271	3.644	33.129	33.129
2	1.324	12.034	47.305	1.324	12.034	47.305	1.306	11.871	45.000
3	1.153	10.482	57.787	1.153	10.482	57.787	1.279	11.628	56.628
4	1.048	9.525	67.312	1.048	9.525	67.312	1.175	10.684	67.312
5	.944	8.579	75.891						
6	.820	7.455	83.345						
7	.693	6.302	89.647						
8	.588	5.343	94.990						
9	.324	2.950	97.939						
10	.162	1.477	99.416						
11	.064	.584	100.000						

It is considered sufficient to regard first several principal components if their summed explained variance is more than 70%. As it is clear from Table 6, the cumulative percentage of the explained variance of the first four components is about 70%, thus they are sufficient to be used in the further analysis.

Let us consider the factors connected with the distinguished components, presented in Table 8.

One of the disadvantages of the component analysis is its complicated and ambiguous interpretation. Let us consider with which variables each of the components is connected.

The first component is closely connected with the decisions on entering a master programme, decisions on studying on a commercial basis, decisions on combining work with study, decisions related to getting a well-paid job or occupying a post with a high level of salary, incentive of distrust to the level of the bachelor degree. This component is probably connected with the labour market functioning. Consequently, the prospective master degree students thus form their decisions correlating them with their opportunities in the labour market.

The second component is related to the decisions of the students on enhancement their knowledge of the profession in a master programme, the incentive of research work in a master programme, incentive of acquiring practical skills and parents enforcement. This factor can be explained with the value of higher education to the students and their parents.

Table 8. Factors connected with the components

	Component			
	1	2	3	4
X1	-.956	.095	.043	.077
X10	.921	-.053	-.074	-.041
X2	.904	-.085	-.012	-.169
X6	.606	-.054	.295	.268
X5	.524	-.171	-.471	-.195
X7	.248	.568	-.265	.266
X3	.445	.516	.391	-.399
X8	.434	.467	-.261	.245
X9	.198	-.447	.233	-.373
X11	.161	.208	.695	.198
X4	.381	-.471	.092	.658
Share of explained variance of the component	0.353	0.120	0.104	0.095

The third component is positively related to the respondent's sex and negatively to the factor of mistrust to the level of bachelor degree. Probably girls trust to the bachelor's education level more than young men.

The forth component is closely related to the incentive of changing the speciality.

As an additional checking of the chosen components we make a graph of eigenvalues (Figure 2), that is often called a "scree plot".

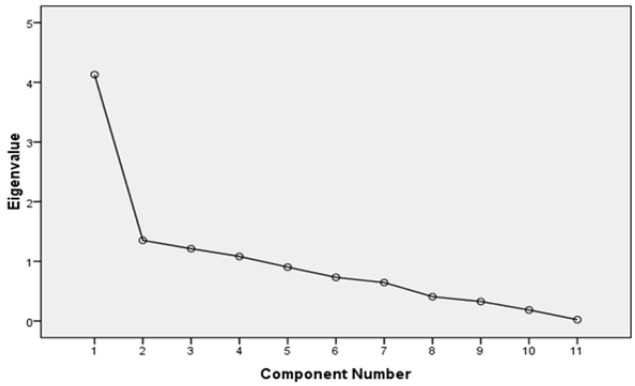

Figure 2. Graph of eigenvalues of the distinguished factors

The analysis is weighted on the criterion: are you going to enter a master programme?

In Figure 2 the abscissa axis represents the numbers of the components (factors) are located in the order of the descending of the respective eigenvalues, the axis of ordinates represents eigenvalues. The eigenvalues are reflected as the points in the plane. The factors forming the slope of the "scree plot" are considered significant, ant those forming the "scree plot" itself are not.

In compliance with the criterion of the "scree plot" the factors situating before the beginning of the scree and the factor that shows its beginning are preserved. In Figure 2 it is clear that the beginning of the "scree" is in the fourth component. The graph proves the conclusion made with the help of the explained variance analysis.

4. Discussion

The results of the component analysis prove that students when choosing their educational strategy, if they should enter a master programme or start working after the bachelor's degree, treat education as an investment to

the human capital which will increase their marginal productivity and consequently will result in more revenues. On the other hand, it is hard to separate the function of education as a signal from its investment function. The students regard education in a master programme as a signal of their abilities, the signal which distinguish them from the other candidates for a more prestigious position. Due to the mass character of education when almost 90% of school graduates enter higher educational establishments and get a bachelor degree, it is difficult for an employer to treat a bachelor degree as a signal. If a candidate has a second, third diploma or a master degree diploma this gives the employer some information on the candidate's abilities and give him a distinctive signal for positioning in the labour market. This is proven by the factors which are part of the first component and their analysis.

The second component relates to the investment and consumption functions of education. Students esteem education, but they don't make their investments to it, to be precise it is the society who make this investment for them. These students appreciate the value of knowledge they get in a master programme, possibility to be occupied in research activity and they do not expect high revenues in the real sector of economy.

In the papers of Russian researches Aistov (2007), Denisova (2007), Lukjanova (2010) one can find the estimates of the return to different levels of education from 4% to 12% for each additional year of study. Training in a master programme increase the number of academic years, thus return to the level of master programme must be more that the one to the bachelor level.

The further trend of our research is planned to be the research of the return to the master degree education and estimation of the demand for masters and spheres of employment in the Russian labour market.

5. Conclusion

Having analyzed the trends of educational strategies of master degree students we can say that the students' incentives of entering a master programme are diversified and reflect certain forms of economic behaviour. Quite a considerable part of the bachelor degree graduates consider a master programme as an investment project, another part, on the contrary, is ready to study in a master programme, but do not link education with the possibility to get a better-paid job. The State Programme "Education Development" aims at a consistent increase of the number of students in master programmes. This is proved by the dynamics of the estimated figures of enrollment for those who study at the expense of the federal budget. We can suppose that the possibilities will be realized for those who are motivated by the incentives to change the speciality of the basic education, enhancement of knowledge of their profession, research activity. These incentives are differently directed regarding the market situation, but implementation of the programme enlarges the accessibility of higher education and possibilities of innovative development. Alongside with that the issue of the degree of the market forming individuals' education strategies is still open.

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Notes

Note 1. Tertiary-type A education. Largely theory-based programmes designed to provide sufficient qualifications for entry to advanced research programmes and professions with high skill requirements, such as medicine, dentistry or architecture. Duration at least 3 years full-time, though usually 4 or more years. These programmes are not exclusively offered at universities; and not all programmes nationally recognised as university programmes fulfil the criteria to be classified as tertiary-type A. Tertiary-type A programmes include second-degree programmes, such as the American master's degree.

Note 2. Tertiary-type B education. Programmes are typically shorter than those of tertiary-type A and focus on practical, technical or occupational skills for direct entry into the labour market, although some theoretical

foundations may be covered in the respective programmes. They have a minimum duration of two years full-time equivalent at the tertiary level.

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Peculiarities of Staff Performance Appraisal with the Use of Balanced Scorecard in the Area of Public and Corporate Management

Raisya I. Akmaeva[1], Oksana K. Mineva[1] & Aleksandr P. Lunev[1]

[1] Astrakhan State University, Astrakhan, Russia

Correspondence: Raisya I. Akmaeva, Astrakhan State University, 20a Tatishchev Street, Astrakhan, 414056, Russia. Tel: 7-851-249-4156. E-mail: ecorai@mail.ru

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Abstract

The total globalization of all aspects of the modern society's life changes paradigm of the traditional management. In contrast to the views of F. Taylor, H. Gantt, P. Drucker, R. Kaplan, D. Norton and other recognized guru of management, in the modern context the public and corporate management face a primary target to develop organization's internal resources. It becomes more and more important to maximize the use of internal potential which is possible only with the application of up-to-date management innovations such as the balanced scorecard strategy and KPI which is a basis of the modern appraisal of staff performance.

Keywords: performance appraisal, KPI, management, balanced scorecard, regional management

1. Introduction

The traditional management by itself does not meet the economic tendencies of the modern world. The most reputed theoretical and practical experts of management worked out a concept "Management 2.0: The new version for a new century" with 25 most long-term tasks the management of the 21st century face (Harvard Business Review, 2009). The most important task of the new version was a task "to work out complex systems for appraisal of performance both of the organization as a whole and of its separate subsystems including a system of salaries and bonus payments". The traditional systems for performance appraisal have a lot of disadvantages, e.g. there is no regard for personal qualities which have an influence on success in a new innovation economy; a quick profit earning is excessively evaluated to the detriment of other important tasks such as search for new directions of growth; that is why managers need to stop sacrificing long-term goals for momentary profit as well as they need to stimulate a process of search for new ways of mobilization and organization of human resource capabilities. This task is especially actualized with the fact that for efficient work of 88-90% of typical company's staff members it is necessary to set goals and tasks correctly and it is obligatory to control their implementation (Harvard Business Review, 2004).

A need for new relevant methods for staff performance appraisal determines scientific and practical significance of the problem under study.

2. Method

Studies on industrial enterprises of the Astrakhan region and public authorities (Akmaeva, 2007; Akmaeva et al., 2011; Lunev et al., 2011; Bulatov et al., 2011; Epifanova, 2013) on the basis of joint use of different analytical methods (questionnaire surveys, statistical methods of multidimensional analysis: cluster and factor analysis, correlation and regression analysis, analysis of operations functions, etc.) allowed to mark out key factors determining efficiency of regional companies' activities.

These studies allowed to conclude that in the context of innovation economy the main source for companies' development would be internal resources which depend on management and full use of staff's potential because only effective transformation of their personal and professional characteristics can lead to a progressive development of organizations. Today both in corporate and public companies, constant adoption of management innovations is a sustainable source of development.

The factor analysis proved a conclusion that regional enterprises did not master all range of analytical methods for strategic management, such as balanced scorecard, interrelation between strategic goals and key performance

indicators (KPI), modern approaches to performance appraisal. At the same time, it should be noted that a specific feature of management innovations is staff's high resistance to changes.

Here we face a paradox. On the one hand, the company's development requires adoption of advanced management instruments including the issues of individual performance appraisal of staff members who are the main source of development. On the other hand, staff "sabotages" innovations. The authors revealed a psychological nature of staff's resistance to changes: firstly, it is a fear to lose powers of authority, secondly, it is a fear of impossibility to make a career in new conditions, and thirdly, it is a fear of changes in the company. A modern manager should study papers of such authors as B. Kaye, Sh. Jordan-Evans, J. Maxwell, D. Hall, O. Mineva where algorithms of staff adaptation to changes are described.

It should be noted that according to the results of the study carried out in 2008-2010 (Epifanova, 2013), the most successful regional enterprises typically focus on goals related to stakeholders' interests, e.g. guaranteed employment in conjunction with high salaries and business reputation of the company.

The task for a modern manager is to transform a potential team into a high-performance team. To fulfil the task it is necessary to study successful experience of KPI use which allows to mark out significance of positions for a company, to work out measured points of staff performance, to demonstrate relation between work results of certain executives and company's development. Adoption of any innovations in the area of staff performance appraisal will always cause potential fear among employees. J. Kotter believes that to adopt any management innovation one should gain support of key inspirers and executives who are in charge of implementation of changes and their promotion among staff members (John P. Kotter). A significant factor is availability and timeliness of comprehensive information on innovations, transitional time for its adoption, availability of training and development of staff members as well as leaders' readiness to support these changes financially.

3. Results

Results of the comprehensive analysis of activities carried out by regional enterprises and public authorities indicate a low level of staff performance appraisal, lack of cascading of organization's strategic goals into strategic indicators of strategic business units, weak interrelation between available instruments of performance appraisal and individual key indicators.

As far back as 50-s, P. Drucker said that a goal by itself is "outside worker's scope". A worker can fulfil tasks which lead to achievement of a goal or result but no one can give 100% guarantee that a result will be obtained. Drucker insisted that focusing on current events managers should not forget to fulfil their tasks aimed at achievement of results, i.e. goals (Drucker, 1954).

Traditional systems of bonus payments, which are currently used by regional enterprises, are of low efficiency and can be often considered by staff members and managers not as an instrument of management aimed at real performance appraisal but as an element of economic formalism.

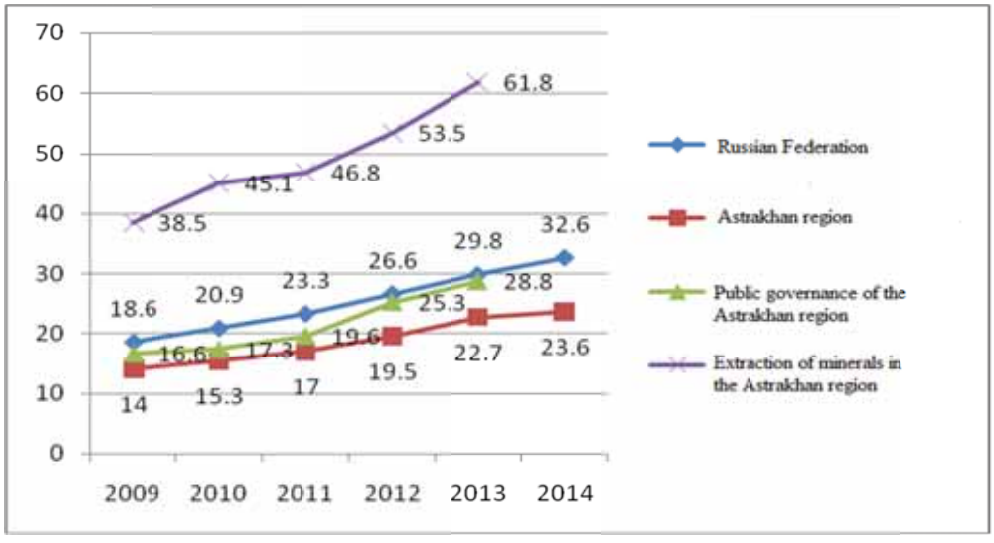

Figure 1. An average monthly salary of workers in the economy of the Russian Federation, in the Astrakhan region, in the public governance area of the Astrakhan region, in the area of extraction of minerals in the Astrakhan region in 2009-2014 (thousand of roubles)

When an average monthly salary of workers is compared one can notice its relatively low rate which does not allow to provide an objective appraisal of staff performance. At the same time there are high salaries on the regional industrial enterprises (extraction of minerals); that fact demonstrates availability of potential pilot platforms for adoption of up-to-date approaches to appraisal of workers' individual performance. Public authorities also must become pilot platforms for KPI adoption in Russia, as President of the Russian Federation Vladimir Putin obliged public authorities to work out such systems for appraisal of public officers' performance.

Therefore, one can draw a conclusion that in the region and countryside, there are rather big pilot platforms for adoption of advanced management instruments in the form of KPI which are modern systems for staff performance appraisal.

There is no doubt that business sphere and state government have different strategic goals but KPI is a unique management instrument which is necessary for ranking of each worker concerning his relevance to tactical and strategic goals that are crucial for current and future growth of a company.

With the use of KPI indicators, which are closely related to strategic goals, it is possible to create a perfect system for performance appraisal of company's staff members with a powerful motivational effect because it is transparent, available for understanding, there is a clear relation between organization's strategic goals, strategic indicators, individual key indicators of performance and rate of compensation which can be received by every worker according to his/her contribution to achievement of these goals.

4. Discussion

Both in classical management by objectives (MBO) and in balanced scorecard (BSc) strategy, KPI is a core element and modern embodiment of the MBO method. Many modern western scientists and staff managers refer the MBO method not only to the traditional performance appraisal method but to the integral performance management system. That is why in the international practice there is more and more frequent use of a term "performance management" – a system of performance management instead of a system of management-by-objectives, though both systems have similar basic principles. Both systems allow to systematize management process through determination of goals and to carry out appraisal of staff performance; they orient on achievement of results, lead to growth of efficiency of company's activities and business as a whole.

Therefore, as a result of BSc and KPI application, companies get an opportunity to unite activities orientation of workers and units with strategic goals of an organization as a whole and to provide fulfilment of the adopted strategy. However, little experience of the BSc use among regional companies shows that within the application of KPI indicators managers make many mistakes. They promote development of an organization; its economy is improved under direct influence of certain directive effects of management. The imperfection of certain areas (non-fulfilment of adopted strategies, discord in balancing of strategic organizational goals and goals of an individual worker, inappropriate motivation of staff members and so on) is explained exclusively with low qualification of managers, lack of regard for a set of effective factors which determine performance of human resources.

5. Conclusion

According to the authors, the efficiency of staff performance appraisal can be assessed from two aspects because of dual nature of human essence which also depends on external factors – an organization where a person works – and on internal factors related to specific peculiarities of an individual worker. It is impossible to consider a concept "efficiency of staff performance appraisal" beyond the system of work relations, strategic goals and a level of organization's market opportunities. This aspect of efficiency of staff performance appraisal – "goal and strategic aspect" – consists in a constant search for the best ways, forms and instruments of management stimulating influence on staff members in an organization towards achievement of organization's strategic goals through elaboration of an efficient system of KPI indicators, achievement of staff performance appraisal relevance to organization's strategic goals.

The achievement of "goal strategic" aspect of management efficiency largely depends on leaders, i.e. where they want to lead their organization to, how they see their mission and strategic goals, whether they act as owners. To our opinion, it is very difficult to separate this goal-oriented or strategic aspect of staff performance from the second (internal) aspect of staff performance related to specific features of an individual worker.

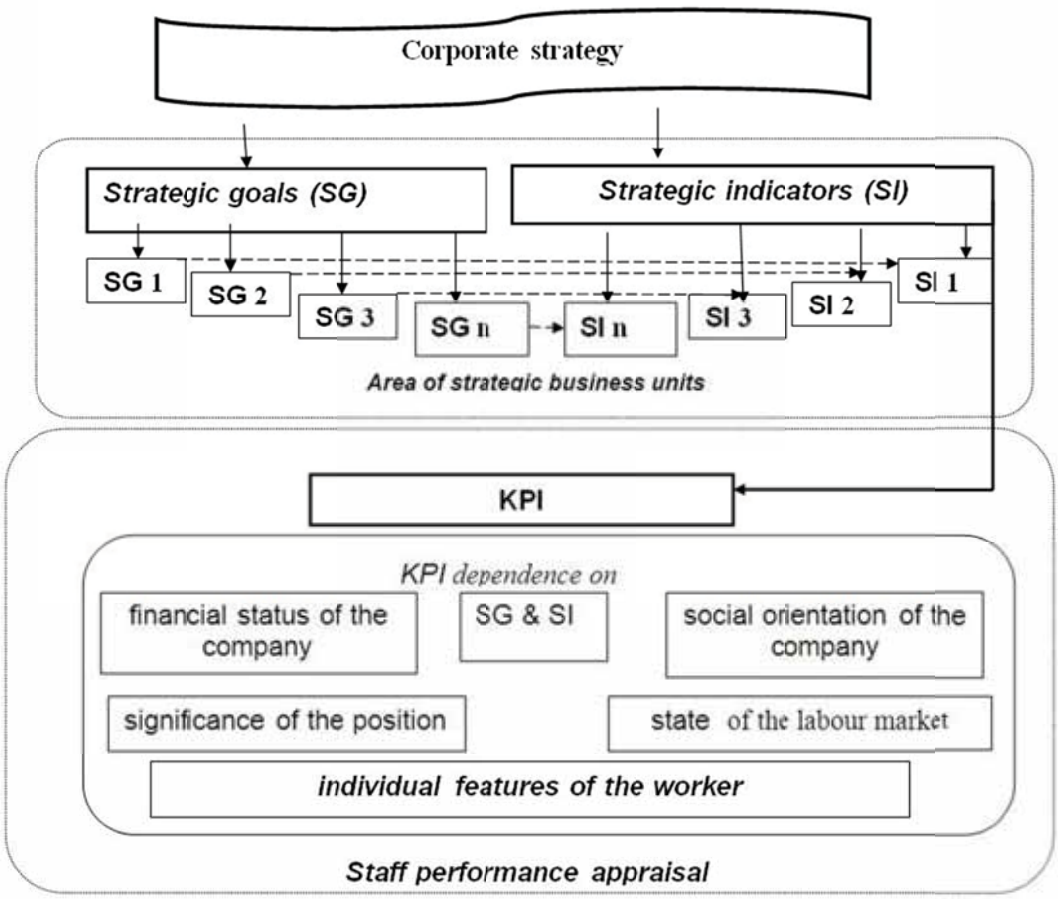

Figure 2. Modern approach to performance appraisal

Meanwhile, the analysis of experience of the KPI application on Russian enterprises indicates insufficient theoretical and practical regard for a concept of dual nature of staff performance appraisal which is determined, on the one hand, by strategic goals planned by the organization and, on the other hand, by specific social and psychological peculiarities and aims of certain groups of people caused by varied factors (from national and historical to psychological ones). If the first aspect of the staff performance appraisal duality is fully represented by a lot of approved KPI indicators in other organizations which adopted the KPI, the second aspect – regard for historically formed social directives and aspirations of staff members in a certain organization –was barely taken into account during the determination of composition and content of the KPI indicators. To our opinion, that is why many projects of KPI-based adoption of BSc strategy failed and, as a consequence, it is necessary to propose existing measures for overcoming of this discrepancy through more frequent application of testing and change of KPI indicators in order to choose those indicators that will be the most relevant and appropriate to social and psychological aims and preferences of social groups in the organization.

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Methodology of Management Innovation Hypercompetition

Veronika M. Vasiltsova[1], Sergei A. Dyatlov[2], Vitaly S. Vasiltsov[3], Tatiana L. Bezrukova[4] & Boris A. Bezrukov[4]

[1] National Mineral Resources University, Saint-Petersburg, Russia

[2] Saint Petersburg State University of Economics, Saint Petersburg, Russia

[3] Cherepovets State University, Cherepovets, Russia

[4] Voronezh State University of Forestry and Technologies named after G.F. Morozov, Voronezh, Russia

Correspondence: Veronika M. Vasiltsova, National Mineral Resources University. 2, 21 Liniya, Saint-Petersburg, 199106, Russia. E-mail: rectorat@spmi.ru

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Abstract

The article presents substantiation of interdisciplinary methodological approach to the study of innovative hypercompetition, discloses its nature and analyzes the specifics of its manifestation. It presents the formation genesis of the categorical essence of hypercompetition in the theoretical insights of Russian and foreign authors of XX-XXI century. The preconditions of the innovative hypercompetitive markets formation, as well as enterprises, operating in these markets, are defined. Specific features of highly competitive products that serve the foundation of global innovation are identified. The role of scientific and research results in the process of innovative hypercompetition is revealed.

Keywords: advance dominant innovations, creative destruction, extended technological system, information economics, hypercompetition, sustainable innovative development, technological stalemate, theory of innovation development

1. Introduction

Globality of modern economy requires innovative approach to competition. The globalization of economic relations, production internationalization, permeability of national economies, liberalization of world trade and transfer of new technologies have given to competition a global nature. Aggravation of contradictions and increased competition is noted at almost all levels, all sectors and types of international and national markets. International competitiveness of products and services became the basic term providing the success of national innovation, as well as corporations, businesses and individual innovators. In the XXI century we are talking about the formation of a qualitatively new kind of competition namely an innovative hypercompetition (Dyatlov, 2010).

Its nature is a controlled hypercompatative development of global markets in the age of advanced leading innovations, providing the new advanced methods of programmable controlled impact on the goals, motives, interests, needs and the economic behavior of people (partners, potential competitors, consumers, etc.) towards obtaining the target programmed benefits and effects by vertical-horizontal-network integration into the global structure.

2. Main Part

Totalizing globalization makes nations and companies to compete severely with each other, using various means, for acquisition of a new scientific knowledge, for the power of supervision and control the resources, information and financial flows, for a share of world markets, ownership of the intellectual and information capital and for the right to inspect and control the economic processes. This largely determines their leadership status and high competitiveness on world markets. On the other hand, new global (supranational) institutions and centers for management, coordination and monitoring of national and interregional organizations, as well as the world economy as a whole, are evolved. Basic concepts, models, methods, mechanisms and forms of economic regulation and competition in the global, national, inter-regional, industry-specific and local levels are qualitatively changing and becoming more flexible, active and total. In the transition to a global innovative and information economy, national governments should take into account in their macroeconomic, foreign and social

policy the priorities and requirements of the global markets development, as well as regulations, requirements and limitations of the global innovation hypercompetiveness, recommendations of global (supranational) control, coordination and management institutions (Vasil'tsov & Vasil'tsova, 2013).

The total and comprehensive globalization, hypercompetition, informatization and net creation leads to a new type of vertical and horizontal net integrated companies with new integrative functions, tasks and techniques of hypercompetitive struggle in the information net economy which we call the global innovation hypercompetitive companies. The new notion of the global innovation hypercompetitive companies introduces into the scientific circulation discriminates the integrative comprehensive approach to competition and innovation. The main features of global innovation hypercompetitive companies are globalness, infonetting, innovationness, hypercompetitiveness, flexibility, mobility, integration. They are distinguished by large size, market domination, high capitalization, matrix net flexible structurally functional organization and efficient interactive management. It is particularly noteworthy that the global innovation hypercompetitive companies differ principally from large traditional companies (for instance, those of raw stock) whose business is based on traditional resources and traditional market technique, management and competition (Dyatlov, 2010).

The best strategy for global innovation hypercompetitive companies is that of aggressive innovation of technological leadership or the strategy of global innovation of hypercompetitivity. Its main components are the intensive hypercompetitive struggle and innovation managerial leadership. In this sense, we introduce another notion of 'leading innovation hypercompetitivity'. The target characteristics and main indicators of the notion are the global status and technological leadership, capture and retention of the world market considerable share, encouragement and stimulation of stable demand for the innovation products of the company. At the same time the global innovation hypercompetitive companies conducts the global capture and defense of rights and boundaries of intellectual property , ingenuity, brands trademarks, financial and net earnings and effects. The status of global innovation hypercompetitive companies is considered as indicators of public significance, power and role formidability at world markets. In these conditions the global innovation hypercompetitive companies acquire for a certain time and appropriate the global intellectual status rent having the nature of information. The information innovation rent is a global category of information economy which can determined as the product of new scientific knowledge (innovation, research and development), obtained and appropriated by the hypercompetitive owner of capitalized new knowledge , information resources and technologies, advanced information leading techniques of competition struggle and creative leadership management of integral (distributed in time and space monetary and non-monetary) earning (profit, effect) resulting from innovation capitalization (development, adoption, accumulation, copying and implementation) at all levels and in all spheres of global economy. This rent has the information net nature. Its prolonged additional integral effect results from the ownership and utilization of information intellectual capital (nonmaterial assets), capitalizable innovations. It accounts for a quite significant share in the pricing structure of the capitalized innovation product (service).

The mechanism of appearance of information innovation rent is nontradional, linear; it is a combination of integral interrelated polyfunctional net effects. The information innovation rent appropriation is based on the implementation and reproduction status brand, polyfunctional net interactive right of new knowledge, information, status brand intellectual property and polyfunctional service brand of innovations by the owner innovator. The mechanism of implementation of this property relates to the interactive right establishment of the owner innovator assuming the assurance of institutional legal protection (Bruhn, 2014).

The global information economy of the innovation hypercompetitive companies results from use of advance innovations, application of techniques of leading programming and manipulation by the management of economic behavior of competitors and consumers using the hypercompetitive creative marketing, management , logistics, etc. to produce various information net effects: multiplication and synergic net (integral) effects. Varian C. R. identifies two main types of net effects: direct network effects and indirect network effects (Varian, 2005).

Economy is a subject-object driven system, which today has an extremely complex structure, where individual subsystems and elements are increasingly gathering features of integral whole that requires a global and integral control, monitoring and inspection. In the context of totalizing globalization, the comprehensive development of information and communication technologies (ICT), as well as aggravation of competition, the global competitiveness becomes a major feature of advanced economy. Its elements include multiple-level nature and multidimensionality, new knowledge (competences), manageability, etc. They define globalization benefits of the world's leading countries and technologically advanced multinational companies that are strengthening under the new paradigm of innovative development.

3. Methodological Approaches to the Analysis of Innovation Competitiveness

Methodological approaches to the analysis of innovation competitiveness are developed since the beginning of the XX century, when in 1911 J. Schumpeter discovered innovative nature of economic development. We believe that hypercompetition in terms of its characteristics within Schumpeter's terminology is close to the concept of "creative destruction or the creative destruction of the market" at the national and global levels (Schumpeter, 1942). According to his theory of "creative destruction", economic development "revolves" around innovations, new combinations of factors make it possible to reduce production costs. Profit goes to those, who are the first in using innovations. When the innovations become fairly common, production costs align and profit disappears. Old products and old forms of production are displaced. We face a process of "creative destruction." Prosperity is replaced by depression. New combinations of factors are implemented and companies specialize to new conditions. The main impetus comes from the new consumer goods, new production methods and commercial distribution of goods to new markets, as well as new forms of economic organization of the enterprises.

Significant contribution to the theory of innovative development was made by G. Mensh (1979), who proved that the exhaustion of the basic innovations resource leads to "technological stalemate", characterizing stagnation in economic development (Mensch, 1979). In 1982 English economists C. Freeman, J. Clark and L. Soete introduced the concept of "extended technological system", involving such elements as technical and social innovations (Freeman, Clark, & Soete, 1982). German economist A. Kleinknecht in 1987 noted that the production clusters of innovative products are emerged in the phase of decay, while those of innovative processes appear in the upward phase of the long wave (Kleinknecht, 1987). Innovation factors have a significant impact on economic growth and competitiveness, and are defined by the formation, development and aging, i.e. by lifecycle of technological systems. The ideas of mentioned authors, as well as a number of other contemporary researchers, provided the basis for the development of the concept of hypercompetiveness.

The concept of "hypercompetition" was studied in detail by R. D`Aveni, who has associated this notion with the "ever-increasing rivalry in the form of rapidly emerging product innovations, reduction the time needed for R&D, aggressive price and competencies competition and experimentation, as well as with new approaches in serving the customer needs". Scientist uses the term "hypercompetition" to describe the industry-specific environment, where contestants must act with lighting speed to get market leadership and destroy the advantages of their competitors (D`Aveni, 1994).

Professor of Basel University M. Brun understands under the term of "hypercompetition" "a situation, where businesses are increasingly subjected to the cumulative effects of the competitive factors, previously isolated from each other, that lead to a multidimensional, dynamic and aggressive competition. Author identifies several distinctive features of hypercompetition. First, it simultaneously covers multiple areas, the most important of which are costs, quality, timescales, "know-how", creation of market barriers and strengthening of financial status. In a hypercompetitive environment, management cannot concentrate efforts on just one of the competitive parameters; they all need to be considered simultaneously. Secondly, companies should take into account the multidimensional nature of hypercompetition. It can occur at different levels, such as the commodity markets, resource area, between different entrepreneurial concepts, as part of a business combination, when the company is struggling against rivals not alone, but allying with other manufacturers, suppliers, cooperation partners and resellers. Multidimensionality of hypercompetition manifests in the fact that the company responds differently to the situation in the various markets. Application of the concept of so-called multi-point competition allows diametrically opposite market behavior of enterprise in various key areas (offensive, defensive, etc.). Third, dynamic market development is a attribute of hypercompetition. Competitors' positions and placement of forces change with increasing speed. Market dynamics is characterized by the continuous penetration of new competitors into the market and exit of old ones from the market, the emergence of new types of services, a large number of mergers and purchases of enterprises, etc. Forecasting the economic situations becomes more and more problematic and the forecasts period is getting shorter. Fourth, a growing aggression of market rivalry is another indication of the hypercompetition. Direct attacks to weaken competitors and infringement of rights are attempted in increasing frequency. The purpose of such aggression is to overturn the equilibrium in the competitors' power outlook. To that end the aggressive pricing policy is used most often (Bruhn, 2014).

As is noted in the works of American researchers B. Allred and K. Steensma, the impact of innovation on competitiveness and economic growth is a general objective law. Important role in this process is played by the willingness of companies to implement innovations under risk and uncertainty of the results. Innovative behavior of companies is affected by factors of innovation at the company level (the scale of the company, capital structure and the level of diversification), at the industry level (rate of technological change, fluctuations in

demand and intensity of competition), and at the level of the national economy. Increase in agility and global scale of competition requires a deeper understanding of the innovation factors and behavior of the companies (Allred & Steensma, 2005).

4. The Factors Influencing Suppression of Innovations

Uncertainty level of future results and high risks inhibit innovations, whereas competition and expected benefits drive them. Unlike industries with monopoly or oligopoly features, the industry sectors, experiencing increasing competition and reduced product life cycle, require timely and effective innovations. These factors are most strongly manifested in global industries, where companies solve the problems of global integration and the organization of international operations in order to achieve efficiency and compete at the global level.

Significant contribution to the study of the influence of innovation factors on economic growth was made by the famous American economist W. J. Baumol, who attempted to integrate entrepreneurship into the market economy model by allocating special role of competition created by new enterprises within the industry. He concluded that the creation of conditions and encouragement the emergence of new innovative companies by reducing market entry barriers may serve as an effective instrument of antimonopoly policy and promotion of competition. According to W. Baumol, in a capitalist economy, product innovation, rather than price, becomes the primary means of ensuring the competitiveness of the leading companies. Product innovation has turned the free market economy into the mechanism of successful growth.

Borrowing and copying of businesses by companies-imitators, who make improvements related to market localization, have a particular importance in the innovation reproduction process. To effectively use this source, one needs to be both successful innovator and successful counterfeiter (Baumol, Eliasson, & Henrekson, 2004).

Renowned expert in the field of management P. Drucker noted that today business is embodied in new forms, whose origins lie in the rapid evolution of modern technology and modern management that itself turns into a new technology. According to him, a new technology is not only advanced materials, electronics and biotechnology, but also a new entrepreneurial management, often providing even a greater impact on progress than new inventions (Drucker, 1985).

The general idea that grounded the development of a new concept of sustainable innovative development by providing hypercompetitive benefits of business entities is that hypercompetition is characterized by ever-increasing rivalry in the form of rapidly emerging technology, managerial and product innovations.

The time needed for R&D in hypercompetitive environment is reduced and an aggressive competitive price and competencies strategy is employed along with the experimentation based on new approaches in servicing the customer needs and buying preferences. Hypercompetition assumes intense and fast actions of leading companies against their competitors towards gaining market superiority and destroy the advantages of their competitors.

5. Conclusion

Hypercompetition is caused by globalization processes, as well as emergence of qualitatively new successful competitors, called hypercompetitors, on local, sectorial, national and international markets (both conventional and virtual-network markets). In our opinion, hypercompetitive companies (corporations) offer innovative products, services, as well as maintenance and management services that are characterized by global innovative nature.

Global innovation is characterized, above all, by offering highly competitive leading innovative products and services with a qualitatively new, largely universal, multifunctional features and consumer attributes, having stable demand in the global markets and receiving the status of global innovations and brands (differentiated by types and trademarks), as well as forming and widening new niches in the global markets and forming and developing new consumers needs and preferences in most countries. The innovations result in the efficient application of production factors when the law of growing earnings leaps under the effect of research and development. R. Wiber notes that, unlike the industrial net, direct net effects and positive response dominate in the information net economy, rather than the law of receding extreme profitability, yield the leaping extreme profitability (Wiber, 2003). While the law of receding extreme performance acts in the industrial market economy (printability), the information net economy enjoys the law of increasing extreme performance. This law is due to a number of factors: innovations, grows of general performance, business integration, appearance of net mollification effects, and others.

Global innovation hypercompetition is a dynamic totalizing process of innovative (intelligential-ideological, scientific-educational, utility-technological, as well as organizational-managerial) competition in global markets

among the leading high-tech companies, representing as a rule, the most developed countries in the world. The works of scientists, who studied over the past 100 years, both in Russia and abroad, the effect of innovations on economic growth, serve a methodological basis for the management of innovative development of various business entities in a hypercompatative environment.

At present, in the 21st century, the total globalization and world market hypercompetitive progress require the theoretical and methodological justification and gradual transition to new ideology, concept, model of business progress and economy in general. It can be determined as the information net economy with the dominant progress of information net economy based on new knowledge, research and development, techniques of active hypercompetitive struggle and innovative management leadership the basic components of which are the global innovation hypercompetitive companies.

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Main Directions and Mechanisms of Industrial Policy of Russia

Irina M. Podmolodina[1], Valeriy P. Voronin[1] & Elena M. Konovalova[2]

[1] Voronezh State University of Engineering Technologies, Voronezh, Russia

[2] Russian University of Economics, Moscow, Russia

Correspondence: Irina M. Podmolodina, Voronezh State University of Engineering Technologies, Ap.136, 13A, Kropotkina str., Voronezh, Russia. Tel: 79-10-341-4392. E-mail: podmin@mail.ru

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Abstract

Under difficult economic conditions for Russian business, characterized by difficulties of Russian companies' access to foreign modern technologies and long-term financial resources, there is a need for elaborated industrial policy which facilitates the development of national industry and provision of economic security of the country. With current sanctions, the Russian enterprises faced the problems of impossibility of getting foreign equipment under the previously signed contracts, re-orientation of orders for the similar domestic production, and attraction of financial resources from internal sources. Solution to these problems lies in the plane of development of "new" industrial policy. The purpose of the article is to determine main directions and mechanisms for realization of measures of industrial policy which facilitates the development of domestic industrial production, implementation of achievements of scientific and technological progress into industrial processes, and import substitution of science intensive products. Realization of industrial policy of Russia supposes the formation of special conditions. These are favorable economic and socio-infrastructural conditions, attractive entrepreneurial regime, high level of training of personnel for various industries, and informational support of government structures. Activation of innovational activity requires mechanisms that ensure the improvement of conditions for fair competition and increase of motivation of companies for innovations; regulation of product markets (service markets) and sectorial regulation for distribution of leading technologies; development of the system of technical regulation, which includes harmonization of legislative basis of Russia and the EU countries in this sphere; simplification of a procedure of entry of new products into the market; simplification and quickening of the procedures of certification, including as to the international quality standards; simplification of a mechanism of import of technologies; strengthening of requirements to efficiency of enterprises' usage of natural resources, safety of products (services) for ecology and health of population, decrease of energy and materials consumption; development of the system of appropriate bonuses and sanctions, harmonization of Russian standards with international ones, particularly, in the directions that are characterized by perspectives of expansion for export of innovational products.

Keywords: industrial policy, innovational policy, technological policy, directions of industrial policy, mechanisms of realization of industrial policy

1. Introduction

Economic development of a country and modernization of economy sectors are impossible without innovations. The factors of activation of innovational activity are conditions, required for scientific research, which constitute innovational environment and development of economy's industrial sphere. At that, the key role belongs to innovations, rational use of human capital, and strengthening of regional economic potential. Solving the problems of formation of innovational environment and implementation of achievements of scientific and technological process into production are possible due to realization of effective industrial and innovational policy, conducted both on the state level and on level of regions. These circumstances are the reasons for the choice of the topic of the research, aimed at the development of conceptual provisions and methodological approaches to development of industrial and innovational policy that ensures economic growth of national economy and its economic security.

Industrial policy is viewed as an element of socio-economic policy of the country and is a system of measures, aimed at progressive changes in the structure of industrial production and according to the chosen national aims and priorities (Abalkin, 1970).

According to the Concept of industrial policy, prepared by the Ministry of Economy of the Russian Federation, it is a complex of measures by the government, aimed at the increase of efficiency and competitiveness of national industry and formation of its modern structure that facilitates the achievement of these goals.

In our opinion, industrial policy is classified as structural, as it forms regional, sectorial, and industry-specific structural transformations; it has mid-term nature and influences the conditions of functioning and development of regions and certain spheres. Industrial policy is determined by the model of reproduction and economy system in the country. Every county has its peculiarities of formation and realization of industrial policy. They include purposes and tasks according to the priorities of economy, principles of formation, mechanisms of realization, and set of industry factors in the country (Podmolodina, 2014).

In our opinion, innovational policy, being a tool of industrial policy, facilitates the development of high-tech spheres of economy. Its purpose is to create favorable conditions for innovational activity; development of necessary infrastructure, ensuring the increase of competitiveness of products, based on the innovations; effective use of state resources, aimed at realization of innovational projects.

Analysis of Germany's experience in realization of industrial policy allows concluding the following. Technological and innovational policies are realized in direct connection with industrial policy. They facilitate the activation of innovational activity (Podmolodina, 2014).

Generating and implementing the novelties is related to the purpose of technological policy, within which two directions are realized: ensuring leadership in the market of high-tech products and increase of innovational level of country's development. The key task of the first direction is development by means of technologies mobility, their development in any sphere and selling to other countries. The second direction is realized with the purpose of reducing the lag of innovational development as to other countries by means of innovations acquired abroad. This, technological policy is aimed at the identification of important technologies, conduct of R&D in these spheres and implementation of received results into the practical activity (Meyer, 1996).

Innovational policy of Germany includes measures that allow solving problems of financing the development of R&D infrastructure, realization of thematic scientific and research and technological programs, support for innovational development of eastern territories and creation of favorable competitive environment, as well as support for development of small and medium business. Issues of financing the system of education and institutions of high school are managed by land governments – ministry of education and ministry of economy (Industrial policy of the European countries, 2010).

Thus, one of the directions of innovational policy is development of state infrastructural support for innovational companies; at that, there is demand and support for activity of various thematic centers and informational agencies, which provide services in the sphere of innovational management (Popkova, 2013; Morkovina, 2014).

Germany's experience in development and realization of innovational policy will surely be useful for Russian economy.

In our opinion, effective innovational policy should possess the following features:

1) It provides the cooperation of subjects of innovational activity;

2) Performs the function of connecting link between macro-economic policy, science, education, science-intense industry, and market (Voronin, 2005);

3) Its realization is aimed at the achievement of strategic aims of the country (Freeman, 1987);

4) Knowledge, technologies, and innovations should be competitive both in the internal, and global markets (Podmolodina, 2014);

5) The decisive role in development of innovational policy belongs to the state (Bergsman, 2000).

Effective innovational policy supposes formation of appropriate infrastructure and implementation of government support for innovational activity of enterprises, which, while performing certain functions, ensure the perfection of mechanisms for the forced transition of the country to innovational oath of development and quick adaptation of enterprises to constant dynamic changes of modern state of the market.

2. Materials and Methods

Understanding of innovational environment, as a result of complex influence of socio-cultural, financial and economic, political, natural and resource, and scientific and technological factors and mechanisms, which ensure the development of scientific and technical sphere, orients at the complex and multi-aspect view of the task and its state. At that, the evaluation of its state gives an idea of the achieved level of development of innovational

environment and effectiveness of functioning of innovational systems and its elements, as well as of opportuneness of conditions for innovational activity.

In our opinion, for the purpose of evaluation of innovational environment, a complex approach should be used, based on the principle of division and further processing of indicators which reflect three main characteristics of conditions for the development of innovational activity:

1. Indicators characterizing conditions for creation of the sector for research and development;
2. Indicators reflecting conditions for development of institutes, legal protection of the results of research and developments;
3. Indicators characterizing conditions for modernization of economy, including technological innovations (Podmolodina, 2011).

The efficiency of the conditions should be evaluated as a level of achievement of planned results. Within realization of the targeted programs of development of innovational activity, the planned results could be the targeted indicators.

Following the requirements of the methods of complex analysis, the evaluation of innovational environment is advised to perform in logical succession of solving separate sub-tasks:

- Choosing directions which characterize innovational development and are to be analyzed;

- Choosing quantitative indicators, characterizing directions of innovational development, which are to be analyzed on the basis of planned values and data on their actual achievement for the viewed period;

- Calculation of coefficient of achievement of planned indicators of innovational development for each provisioned direction;

- Calculation of summarizing integral indicators, characterizing conditions of innovational environment, necessary for realization of the chosen directions of innovational development;

- Determining general complex indicator, characterizing the development level of region's innovational environment.

The first stage includes choosing the most important directions of innovational activity, influencing the innovational development of the country, which are to be analyzed. In our opinion, these are conditions for creation of competitive sector of research and work, development of institutes of use and legal protection of the results of research and work, and modernization of economy based on technological innovations.

The second stage includes choosing quantitative indicators, characterizing the planned and actual realization of the direction of innovational development, chosen at the first stage. Each of the stated directions requires certain conditions and mechanisms of implementation, so it's characterized by a variety of indicators.

The third stage includes determining the level of opportuneness of conditions of innovational environment based on the calculation of coefficient for achievement of planned indicators of innovational development of economic system for each provisioned direction. This coefficient is calculated as a ratio of the value of actual achievement to the planned indicator.

The fourth stage includes calculating generalized integral indicators, characterizing conditions of innovational environment as to the chosen directions. The generalized integral indicators, characterizing the level of opportuneness of conditions for each of directions, are advised to be calculated according to the following formula:

$$J_{uo} = \sqrt[n]{\prod_{n=1}^{n} K_i},$$

where K_i - individual indicators, characterizing a group of conditions;

n – quantity of individual indicators;

J_{uo} - generalized indicator, characterizing the level of opportuneness of conditions for each direction of innovational environment.

The fifth stage includes determining the general complex indicator, characterizing the development level of innovational environment and level of opportuneness of its conditions in view of all three directions of innovational development.

Using coefficients of weight, found by expert method, it is possible to find complex indicators, characterizing the general level of opportuneness of innovational environment of the country and efficiency of innovational policy. For this, the following formula is used:

$$A_{uo} = \sum_{j=1}^{n} J_{uo(j)} * B_j$$

where A_{uo} – value of indicator of complex assessment of innovational environment for each year;

B_j – weigh value of generalized indicator of conditions of innovational environment as to the directions.

The received indicators characterize the general dynamics of development level of innovational environment. Analysis of dynamics of generalized indicators, characterizing the level of opportuneness of conditions for each of the directions of innovational environment, allows revealing the problems of innovational development of substantiate measures for their removal.

3. Results

On the basis of the offered methodological approach, the evaluation of innovational environment was performed. The received results are represented in the form of three-dimensional model, which allows visually presenting the problems and top-priority directions of improvement of the country's innovational environment.

The fields of the following values are situated at the axes:

X – generalizing indicator of the level of competitive sector of research and work;

Y – generalizing indicator of the level of development of institutions of use and legal protection of the results of research and work;

Z – generalizing indicator of the level of modernization of economy on the basis of technological innovations.

The solid line on the axes X, Y, Z (Figure 1) shows the normative values equal to 1. This is the case when conditions of innovational environment allow achieving fully the planned results.

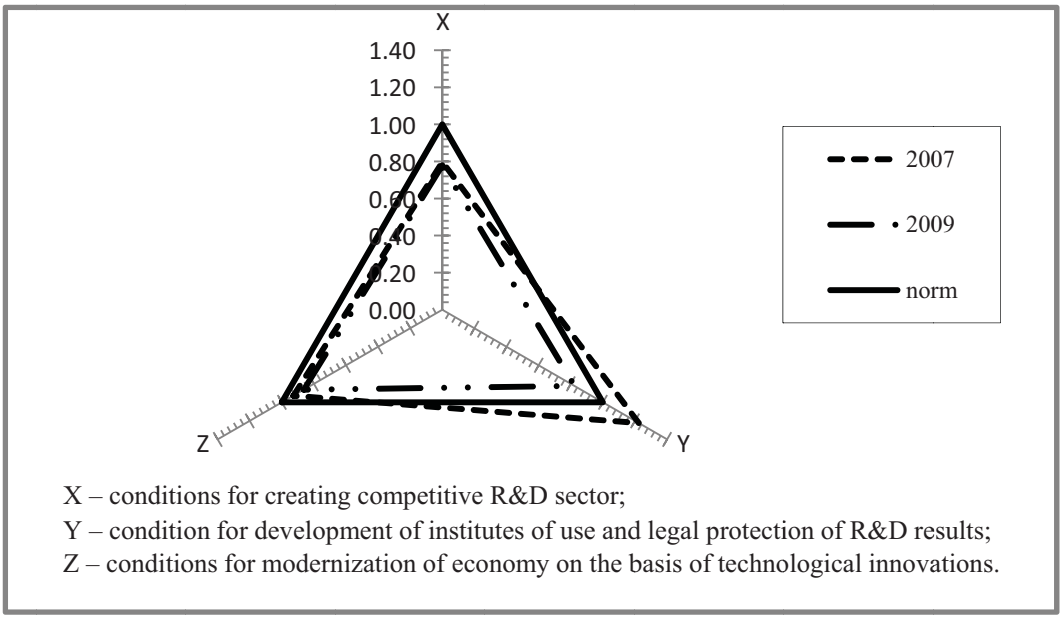

Figure 1. Evaluation of conditions of innovational environment

Figure 1 shows that the conditions that characterize the development of institutions of use and legal protection of the results of research and work in 2009 substantially decreased as compared to 2007. This is caused by the reluctance of entrepreneurial sector to purchase and implement innovational technologies into productive activity.

Indicators of each direction are ascribed coefficients of value, using the expert method. They are shown in Table 1.

Table 1. Coefficient of value of indicators of innovational development directions

Directions of innovational development	Value coefficient
1. Creating competitive sector of research and development	0.4
2. Development of institutes of use and legal protection of the results of research and development	0.3
3. Modernization of economy in the basis of technological innovations	0.3

Complex indicator, characterizing the development level of innovational environment in view of three directions, is shown in Table 2.

Table 2. Complex evaluation of innovational development of the region for 2005-2010

Directions	2005	2006	2007	2008	2009	2010
1. Conditions for creating a competitive sector of research and development						
Complex indicator $Kj_{(1)gen}$	0.3603	0.0672	0.3188	0.307	0.3117	0.3168
2. Conditions for development of institutes of use and legal protection of the results of research and work						
Complex indicator $Kj_{(2)gen}$	0.2536	0.3108	0.3674	0.3278	0.2469	0.2663
3. Conditions for modernization of economy on the basis of technological innovations						
Complex indicator $Kj_{(3)gen}$	0.2858	0.2991	0.2786	0.2512	0.2590	0.2424
Complex evaluation of innovational environment of the country	0.90	0.68	0.96	0.89	0.82	0.83

Complex evaluation of innovational environment by years, showing the efficiency of innovational policy, presented in Figure 2.

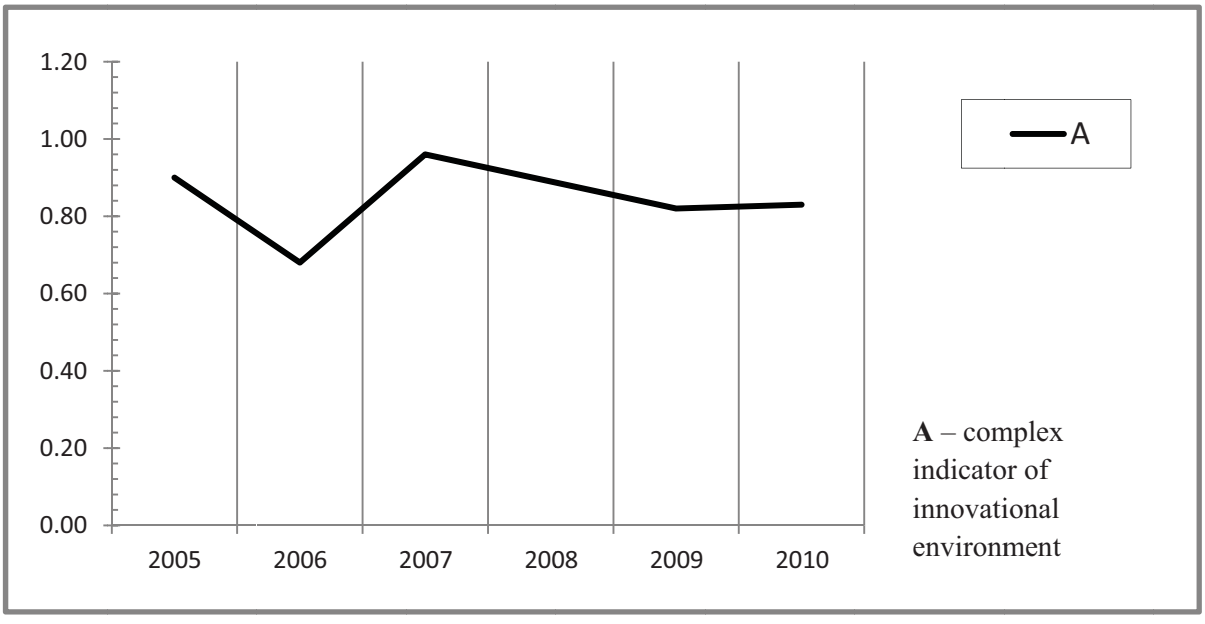

Figure 2. Complex evaluation of innovational environment by years

The conducted complex evaluation of innovational environment allows concluding that the best results in development of innovations and work were in 2007. In that year, the complex evaluation of innovational development reached the desired level (standard). However, it should be noted that during this period there was also underfulfilment of indicators that form the competitiveness of innovational sector of economy, which is caused by the lack of funds (expenses), given for research and work.

The least assessment belongs to innovational activity in 2006, which is also caused by lack of investments in this sector of economy.

Global financial crisis influenced not only financial sector of economy, but also innovational activity of enterprises. In 2009, due to lack of investments into innovations, the complex evaluation of innovational environment in the country was the lowest for the 4-year period (2007-2010). In 2010 there was a slight improvement of innovational environment.

Thus, evaluation of innovational environment allowed revealing the problem of insufficient effectiveness of mechanisms that ensured the commercialization of scientific development and use of leading technologies in productive activity, which is caused by insufficient government support for innovational activity of enterprises.

4. Discussion

Assessment of innovational environment of the country, characterizing the conditions for conduct of innovational activity, allowed revealing the problems, solving of which must be provisioned within industrial and innovational policy. First off, these are measures aimed at the creation of favorable conditions by means of perfecting the mechanisms of support for innovational activity at various stages of innovational process:

- development of legal, investment, and informational provision of innovational activity, development of innovational culture;

- government support for creation and use of objects of intellectual property (Podmolodina, 2011);

- government support for innovational activity at the stage of design and experimental work and preproduction;

- support for innovational activity during the transition to serial production at the stage of development of innovations and innovational growth:

Thus, the main mechanism for development of conditions, necessary for implementation of achievements of scientific and technical progress into industrial production is realization of innovational projects, observation of conditions for constant state management (Industrial policy of the European countries, 2010).

Using the Germany's experience, it is possible to offer recommendations as to improvement of innovational policy, which include:

1) reduction of taxes and removal of administrative barriers for innovational activity of enterprises (Popkova, 2013);

2) provision of highly skilled staff for small companies, with the help of professional training and personnel training on the spot and during the industrial process (Industrial policy of the European countries, 2010);

3) provision of state scientific and research base for implementation of joint innovational projects within private-public partnership (Dunning, 1993);

4) financial support for innovational activity of enterprises in the form of:

- grants for realization of targeted thematic scientific and research programs;

- subsidies for small enterprises' working in R&D performing on the cooperation basis;

- loans or venture capital for innovative and small enterprises for realization of innovational projects (Morkovina, 2014).

It should be noted that if the technological lag of Russia remains, it will be important not only to provide support for innovational activity of enterprises, but concentrate on the import of technologies and their implementation. This predetermines the necessity for training of personnel – especially, for small and medium business – that will be able to provide effective cooperation of the enterprise's departments (R&D, production, marketing, sales), involved into innovational process.

5. Conclusion

Realization of industrial policy requires formation of special conditions. These are favorable economic and socio-infrastructural conditions, attractive entrepreneurial regime, high level of personnel training for various industries, and informational support from government structures.

Activation of innovational activity requires conditions which are caused by the improvement of the following mechanisms:

(1) mechanism providing the improvement of conditions for fair competition and strengthening of companies' motivation for innovations. This supposes the development of measures, aimed at the increase of efficiency of work of anti-monopoly authority in case of violation of competitive conditions. Under conditions of market economy, it is competition that makes the companies implement the achievements of scientific and technical progress for acquiring new competitive advantages.

(2) mechanism of regulation of product markets (service markets) and sectorial regulation, which facilitates the provision of favorable conditions for expansion of leading technologies. One of the directions of development of this mechanism is creation and development of technological platforms which are based on the partnership of business, science, and state, and will become tools for stimulation of innovations.

(3) development of the system of technical regulation which included the following mechanisms:

- harmonization of legal base of Russia and countries of the EU in this sphere, with full acknowledgement of the results of certification of by laboratories and certification centers;

- simplification of the new production rollout, including the formation of requirements, giving the manufacturers the possibility for production rollout under their responsibility, declaring with additional requirements for marking and increase of responsibility;

- simplification and quickening of the procedures of certification, including the according to international standards of quality;

- simplification of mechanism of technologies' import – primarily, by means of cancel of the requirement to provide approval documents for import of equipment, the list of which is established by the Government of the Russian Federation;

- strengthening of requirements for efficiency of enterprises' using the natural resources, safety of production (services) for ecology and health of population, reduction of energy and material consumption;

- development of the system of appropriate bonuses and sanctions, harmonization of the Russian standards with international ones, particularly, in the directions that are characterized by perspectives of expansion for export of innovational products.

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Economic and Mathematical Modeling of Food Security Level in View of Import Substitution

Aleksey Rogachev[1]

[1] Volgograd State Agrarian University, Volgograd, Russia

Correspondence: Aleksey Rogachev, Volgograd State Agrarian University, Ap. 109, 6, Sovetskaya str., Volgograd, 400066, Russia. Tel: 79-27-257-9342. E-mail: rafr@mail.ru

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Abstract

Strategy of development of any country's economy supposes the purpose of achieving and preserving food security which is determined as the state's capability, guaranteed by corresponding resource potential, to satisfy - independently from external and internal conditions and in stable manner – the need of country's population on the whole and of each citizen for food products and drinking water in volumes, assortment, and quality, sufficient for full physical and social development, health support, and provision of expanded reproduction. The problem of provision of food security remains topical since the start of liberalization of foreign economic policy in Russia. The authors of the article use the mathematical tool of fuzzy logic to develop economic & mathematical model of evaluation of the level of food security in view of import substitution. By the example of the Russian Federation, the authors show the manifestation of the problem of food security under the modern conditions, and how this problem can be solved with the help of import substitution. The developed economic & mathematical model allows modeling the functioning of the system through setting the corresponding components of vectors. Implementation of the offered food model allows receiving integral evaluation of the state of food security and determining comparative characteristics of the values of threats to food security on the basis of their automatized evaluation.

Keywords: food security, economic & mathematical modeling, modeling the level of food security, import substitution

1. Introduction

In all developed countries, the state – with the help of various economic and financial actions and methods (including the system of subsidies and compensations, tax exemptions, reduction of tariffs for resources used by agriculture, system of crediting and insurance with compensations from budget, etc.) – provides constant support for agriculture. This allows not only improving food provision of country's population but exporting large volumes of agricultural production and food products.

New political system of the Russian federation and emerging global economic relations required rethinking of the notion of "food security", specification of its main principles and peculiar features. One of the criteria of food security of citizens is the level, at which at least 80% of food products, consumed by population, are produces by domestic agrarian sector. This research performs evaluation and modeling of the level of food security in view of import substitution. The subject of the research is food security of modern Russia.

2. Materials and Methods

Founding on the totality of theoretical suggestions which treat the food security level of production enterprises as a function of interconnected and exogenous factors, influencing the production, it is possible to evaluate the level of threats with the help of mathematical tool of fuzzy logic which is widely used in the systems of artificial intellect. The offered approach allows evaluating the causes and scales of emergence of crisis situations more adequately and receiving indicative instrumentarium for increasing the level of food security.

Mathematical tool of fuzzy logic is used when existing quantitative and qualitative information is not enough, or it is not sufficient for receiving statistically significant conclusions with the required level of reliability. This approach allows forming the portfolio of project decisions on the basis of fuzzy evaluations of their technical and economic indicators by expert ranking, or solving the formulated task of economic & mathematical optimization.

Flexibility and universality of methods of the fuzzy mathematics theory allow viewing them as an effective instrumentarium for solving various perspective tasks of analysis of alternative projects and variants.

As an instrumental means, which implements the viewed approach, a package of applied programs FuzzyLogicToolbox of MatLab computer mathematics environment can be recommended; it allows creating systems of fuzzy logical conclusions and fuzzy classifications with possibility of their integration into Simulink program. The basic notion of FuzzyLogicToolbox is FIS-structure which contains data for functional expression of "inputs-outputs". The structure of received system of fuzzy logical conclusion is presented in Figure 1.

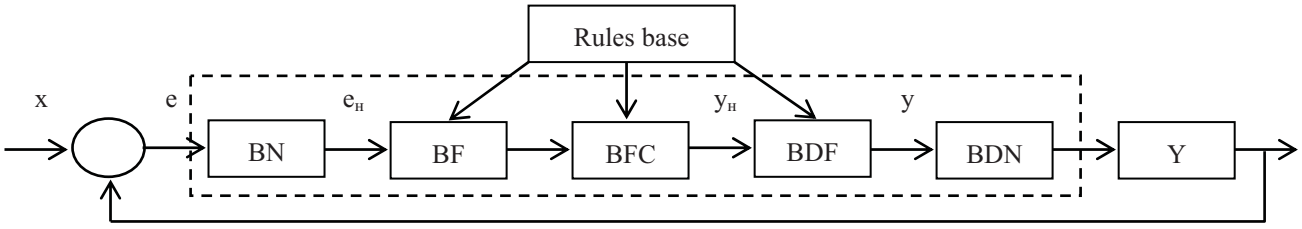

Figure 1. Algorithm of the system of fuzzy logical conclusion

Figure 1 shows X – input sharp vector;

BN – block of normalization. The input sharp signal of vector s is multiplied by scale coefficient $k_{e.н.} < 1$ and transforms for interval, limited by, for example, [-1,+1];

NF – block of fuzzification forms the value of function of membership function which corresponds to the normed value e_n.

BFC – block of fuzzy conclusion, in which – based on fuzzy information about vector – a conclusion is made as to corresponding fuzzy variety of values y; here, a so called inference-procedure is realized, in the process of which the conclusions of particular rules are aggregated. The result of aggregation is "cut" fuzzy varieties.

BDF, BDN – blocks of defazzification and de-norming perform the opposite procedures: according to several "cut" membership functions, a sharp value of normalized value $y_н$ and corresponding unnormalized value $y = y_н / к_{у.н.}$ ($к_{у.н.} < 1$) are found;

Y – output sharp vector of manageable parameters of food security.

As the output data for evaluation, analysis, and visualization of parameters of the studied object in the developed system of fuzzy-multiple models of food security and for their formalization in the system of computer mathematics MatLab, the annual volume of production, consumption, and import of food products in Russia in 2014 (Table 1) was used.

Table 1. Annual output of production, consumption, and import of food products in Russia in 2014, million kg

Product	Production	Consumption	Import
Meat and meat products	53	72	19
Milk and dairy products	115	254	139
Bread and flour products	71	123	52
Fruits	34	95	61
Vegetables	57	129	72

Based on the output data of the model of food security, the directions for perfecting the food system of the country under the conditions of uncertainty are determined. In the process of mathematical modeling of food security, three levels of values for each of the viewed indicators were taken into account at first – "marginal"; "critical", "high". Formalization of nominal indicators, determined not on quantitative but qualitative level, was also performed with the use of membership functions, set by experts.

At the second stage of modeling of the level of food security, the values (marginal, critical, high) of the food security level were determined. In order to determine the type and form of the above membership functions for each variable, they were approximated by universal dependence

$$y(x)=\sum_{i=1}^{N} \phi_i(x) * Q_i \quad (1)$$

where f (x) – function of normal distribution of centered and normalized random value x,

Q - ***i-я*** derivative from function of normal distribution.

For quantitative description of elements of modeled system, two multitudes are used:

- fuzzy situations from the environment of possible states of elements;

- relations between elements.

Each of elements p_i of the modeled system from basic multitude B_t corresponds to certain linguistic variable LV (r_i, B_i). LV is determined at term-multitude $\{r_i,M_i\}$, which is a set of linguistic values, characterizing typical states of element. Quantity of typical states of element is marked as M_i. In order to describe the terms $r_{i,k}$,k=1,M_t, which correspond to values of element p., fuzzy membership functions from multitude M, ={m(b),, $b \in B_i$} are used.

Connections $v(p_i,p_j)$ between typical states of each pair of elements are set by one of the values of term-multitude of linguistic variable ($v(p_i,p_j)$,$r_{v(pi,pj)}$,$B_{v(pi,pj)}$), where $r_{v(pi,pj)}$ – term-multitude of linguistic variable $v(p_i,p_j)$.

Cause relations between each pair of elements (p_i,p_j) from variety of connections $V=\{v(p_i,p_j)\}$ are formed as oriented graph. By setting connections between elements through membership functions, it is possible to receive productional models, characterized by varieties of fuzzy rules.

Membership functions for each variable at each term are set by correspondencies:

$$m_k(x)=\{m^L_k(x)=\exp(-((c_k)/o^L_k)^2),x<c_k;m^R_k(x)=\exp(-((x-c_k)/o^R_k)^2),x\geq c_k\} \quad (2)$$

Thus, variety of terms and membership functions of input and output variables are determined by the above limits of terms $[\Gamma^L_k,\Gamma^R_k]$.

During implementation of the procedure of expert evaluation, the set of rules R_j, $j = 1,N$ is formed, each of which corresponds to membership functions of conditions and consequence. At that, rules which include coinciding consequences and relating to general interrelation, are grouped into common rule with the help of operations of logical summing.

Quantitative measure of the result of interconnection between elements is determined on the basis of procedures of fuzzy conclusion. Fuzzy rule is presented as $A \rightarrow B$. Condition A can be presented as:

$$\text{If } (x_1 \in A) \text{ AND} \ldots (x_j \in A_j) \text{ AND} \ldots (x_M \in A_M) \text{ then } (y \in B_j) \quad (3)$$

In order to receive output level of activation, the logical multiplication is used:

$$m^j_A(x)=\min_i(m_A(x_i)) \quad (4)$$

Aggregated membership function is determined by logical summarizing

$$m_B(y)=\max_{j=1,N}(m^j_A(x)\ m^j_B(y)) \quad (5)$$

Point estimation of the result is determined as to the center of the sphere:

$$Yc=(\int_y m_B(y)ydy)/(\int_y m_B(y)dy) \quad (6)$$

Specifying input vector of influence through $X = (x_k)$, $k = 1, K$, and resulting vector as $Y=(y_t)$l, l=1,L, it is possible to put the result of functioning of modeling system as

$$Y = F(X, U, W), \quad (7)$$

where W – internal and external factors;

U – control actions.

Accounting of feedback in the modeled system is realized by recurrent dependence

$$Y(t) = F(X(t -1), Y(t -1), U(t -1), W), \quad (8)$$

where t – year of system formation.

Mathematical model (7) or (8) allows modeling the functioning of the system through setting corresponding components of vector X.

Realization of supposed food model allows receiving integral evaluation of the state of food security and determining comparative characteristics of volumes of threats to food security on the basis of their automatized estimation.

In order to receive generalized indicator of food security, it is possible to use additive fold in the form of linear combination of private criteria-indicators:

$$S=\sum_{j=1}^{J}\sum_{i=1}^{I} K_i X_{ij} \quad (9)$$

where X_{ij} – value of particular indicator;

K_{ij} – "weight" of particular indicator;

I,J – quantity of indicators of blocks in the system of indicators.

Realization of the described model with the use of integral indicator (9) allows implementation of typification of threats to food security. Areas of values of food security indicators can be divided into 3 classes:

(1) high security class – characterized by relatively weak influence of threats, prevented by planned influences of the management system or regulatory market processes.

(2) class of allowable level of security – significant influence of threats, requiring prompt and expensive measure for neutralization and elimination of emerging threats. These influences are mainly within the limits of resource capabilities of the subject.

(3) class of critical level of security – when the system cannot cope with them alone and in time. Violating threshold values by great numbers or by all indicators characterizes the full excess of allowable level of food security.

The final stage of determining the level of food security provision at the level of the country is recommendations as to performance of the measures for prevention of damage and minimization of losses.

3. Results

Strategy of development of any country's economy supposes the purpose of achieving and preserving food security which is determined as the state's capability, guaranteed by corresponding resource potential, to satisfy - independently from external and internal conditions and in stable manner – the need of country's population on the whole and of each citizen for food products and drinking water in volumes, assortment, and quality, sufficient for full physical and social development, health support, and provision of expanded reproduction. The problem of provision of food security remains topical since the start of liberalization of foreign economic policy in Russia (Popkova & Tinyakova, 2013a). Modern criteria of food security include the share of expenses for food in general expenses of particular groups of population, territorial accessibility of products (measured by comparing the level of retail prices for similar products in different regions of the country), level of "comfort" of food (share in consumption of modern products which reduce losses and save time for work in household), level of "naturality" and good quality of products, influence of food quality on health and life span, including products received with the help of genetic engineering and biotechnologies (Popkova & Tinyakova, 2013b).

The stated criteria of food security cause its dependence on the state of food market which is defined – in broad aspect – as activity, related to production and realization of food products. An important component of the strategy of development of food market is the strategy of forming product resources which is directed - from the positions of provision of food security – at the creation of strategic and operative reserves of food and satisfaction of country's population needs for food products, primarily, by means of own resource potential and not import.

The situation in the food market is strongly influenced by import of agricultural raw materials and food. Over 2000-2014, their import in Russia grew by 2.7 times. In 2006, the volumes of export of agricultural production grew by 5.8%, as compared to 2005, the volumes of import – by 16.6%. As a result, the gap between export and import grows (Popkova et al., 2013).

At present, the share of export of agricultural production in general export of Russia is just 2.2%. Export of agricultural production in non-CIS countries grows with higher rates, as compared to export to CIS countries – it constitutes 50% of the total volume of export supplies in this group of products. Over 2004-2014, the growth rates of agricultural production import constituted 56.0%, while its manufacture in all categories of economy grew only by 27.2% (Rogachev et al., 2014).

It is assumed that the country loses its food security if the share of imported production in the total volume of consumed production exceeds 20-25% (Garthwaite et al., 2015). In Russia, this share constituted 40% in 2000. According to economists' estimates, the share of imported meat in the volume of meat reserves in 2014 reached 50% (in 2004 – 14%; 2008 – 32%; 2010 – 48%) and continues growing. The share of meat by-products and waste in the total volume of processed production constitutes around 35%. These tendencies lead to sale crisis, bankruptcy of the Russian food producers, and catastrophic reduction of livestock number in agriculture (Rogachev et al., 2014).

There are difficulties not only with raw material for food industry but also with production capacities which allow processing the raw material into final product. Thus, RF suffers losses, exporting corn and importing products, manufactured on the basis of corn. At present, according to experts, 1 ton of exported flour corresponds to 100 tons of exported corn. As a result, capacities of milling enterprises are loaded only by 60%. Manufacture of cattle breeding production reached only half of the level of 1990 (Mazaeva, 2012). At the same time, in particular spheres, like production of poultry meat, there was a growth by 15% in 2014, as compared to 2008 (Rogachev et al., 2014).

Poultry, pork, lamb, butter, and milk-powder are the products which are capable of not only substituting imported production but of being exported to foreign markets. Statistical data shows that import of the stated products continues to grow. Thus, in 2014, import of lamb constituted 14.9 thousand tons, as compared to 6.9 thousand tons in 2013, i.e., it grew by more than twice; pork – 661.1 thousand tons and 584.9 thousand tons (growth by 13%); butter – 164.8 thousand tons and 132.8 thousand tons (growth by 27.8%, correspondingly) (Rogachev et al., 2014).

Resources of fresh and frozen meat, cheese, and butter are formed over the recent years by means of import. In 2014, the share of import in manufacture of these products constituted 71.2%, 62%, and 65%, correspondingly. Domination of imported production leads to growth of prices for the types of food products, production of which reduced in 2000-2006, as compared to 1995. According to the data of Federal customs service, the average contract price for beef, purchased in non-CIS countries, constituted USD 2,382 per ton in 2014, which is by 1.9 times more than the corresponding level of 2013. The price for pork over this period grew by 1.6 times, the price for poultry meat – by 12.4% (Rogachev et al., 2014).

The Russian Federation has an unsatisfied internal demand. This demand comprises the potential for market growth for Russian manufacturers. Low profitability of agriculture remains a difficult issue which hinders the Russian manufacturers' entering foreign markets and strengthening of positions in the internal market. In 2014, the number of unprofitable agricultural organizations constituted 40% of their total number. Profitability of production of milk (1.5%) and pork (22%) is still very low; profitability of vegetables (3.31%) is clearly insufficient; production of beef is still unprofitable (-10% according to the data of 2014) (Rogachev et al., 2014).

4. Discussion

Over the recent years, the problem of food products' safety for consumers became sharp in Russia, which is caused by growing supplies of dangerous and low-quality food products in the market. According to National fund for consumer rights protection, more that 40% of imported food products are falsified in food and outdoor wholesale markets. In this situation, consistent import substitution of food products and gradual reduction of their share in the Russian market is one of the directions of solving this problem (Maitra & Rao, 2015).

The reasons for penetration of low-quality import products into the Russian market are lack of strict customs control and entrepreneurs' wish to gain quick profit. Due to that, low-quality products past their sell-by date and without true information in Russian language are purchased. Raw recourses base of processing and food industry is supplied with imported raw materials. Thus, for example, Amur meat processing enterprises work with import raw materials (primarily from China, Argentina, and Brazil) which is not of high quality (He, 2015).

Consequently, Russia faces the problem of import substitution. At that, it should be noted that due to its size, quantity of population, and large internal market, possessing their own sources of raw materials and energy, our country could cease to be an importer of most of food products (meat, sugar, milk, etc.).

As is well-known, the policy of import substitution is one of the forms of protectionism, i.e., state protection of particular spheres of national economy from foreign rivals. Researchers, which criticize this policy, give the following argument.

In order to direct the flows of investments in these spheres, the state sets high import duties for foreign companies' products. As the products, which are manufactured under these conditions, are not competitive in the external markets, it cannot be exported (Jacknowitz et al., 2015). Still, in this case, together with gaining

"independence" from the import of consumer goods and semi-finished products, the state falls into the "dependence" on the import of raw materials and equipment, which is negatively reflected on the country's payment balance.

As the protected spheres receive a lot of invested capital, the payment for imported equipment requires foreign currency which is expropriated from enterprises of raw materials export, traditional for Russia; but as the capital is invested in less effective enterprises, the growth of export sector is slowed down. This inevitably leads to reduction of economic growth.

Over the last two decades, the import of meat, fish, and raw sugar grew substantially. The most difficult situation arose in the internal meat market, where the share of import in the resources has a sustainable tendency for growth from 45.6% in 2014 to 63.8% in 2014 (Rogachev et al., 2014).

Prohibitive measures as to the import are, as a rule, ineffective, and import substitution should be a result of growing demand for domestic products, due to the growth of their consumer qualities. Moreover, the policy of import substitution can lead to uncompetitiveness of the Russian enterprises and unreasoned expenses of the budget and population; besides, it doesn't always lead to support for agricultural manufacturer. For example, strive for ousting imported sugar from the Russian market led to the fact that we pay double price for it, as compared to the European countries; at that, production of sugar beet drops annually, and imported raw materials are used more and more for sugar production.

In order to evade tough economic and social consequences, it is necessary to create and realize state import substitution programs at the federal, regional, and district levels which should clearly reflect the set goals, tasks, and sequence of actions, and main directions of food import substitution. In the process of development of these programs, it is necessary to take into account specific peculiarities of agricultural production of country and specific region, as well as climatic and natural conditions of the Russian production.

Implementation of these import substitution programs will stipulate the increase of competitiveness of production, overcoming critical dependence of the Russian economy on production import, and solving the problem of the provision and strengthening of food security.

5. Conclusion

Thus, in modern Russia, the share of imported production in the volume of consumed production exceeds 50% and continues growing. Consequently, there is unsatisfied internal demand. This demand comprises the potential for market growth for Russian manufacturers. Low profitability of agriculture remains a difficult issue which hinders the Russian manufacturers' entering foreign markets and strengthening of positions in the internal market.

The research that was conducted on the basis of usage of fuzzy & multiple methods and possibilities for solving the tasks of evaluation allowed taking into account qualitative characteristics of food security and transforming them into numerical form, for conduct of scenario analysis. As a result of the research, it was found that modern Russia faces the problem of food security. It can be solved with the help of import substitution.

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Economic Mechanisms for Managing Food Security in the System "Production-Consumption-Import"

Aleksey Rogachev[1], Tamara Mazaeva[1] & Ekaterina Egorova[1]

[1] Volgograd State Agrarian University, Volgograd, Russia

Correspondence: Aleksey Rogachev, Volgograd State Agrarian University, Ap. 109, 6, Sovetskaya str., Volgograd, 400066, Russia. Tel: 79-27-257-9342. E-mail: rafr@mail.ru

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Abstract

Green revolution almost spent its resources, and scientists haven't found the way for the quick increase of potential capabilities of newly bred sorts of grain crops, grain legumes, and cereal crops, of potato, sugar beet, vegetables, and feed crops. Due to impossibility of use of ecological tools, there is a necessity for the search for new ways of providing food security. In this research, economic mechanisms of managing food security in the system "production-consumption-import" are developed. The authors analyze the notion and meaning of economic mechanism, determine the current state of food security of modern Russia in the system "production-consumption-import" in comparison with other countries, and determine problems and perspectives of its increase. As a result of conducted analysis, the authors come to conclusion that current food situation in Russia is characterized with features of chronic lack of food and incapability or lack of wish of their authorities to solve this problem. Socio-economic state of agriculture does not ensure the economic accessibility of food products for all groups of population. As the key economic mechanisms for managing food security, this research offers the formation of growth poles, or economic cores, and creation of agricultural clusters.

Keywords: food security, economic mechanism, manufacture of good products, consumption, consumption norms, food products import

1. Introduction

In the 21st century, the food problem is, without any doubt, the most important, sharp, and topical for all humanity. Despite large progress in the development of agriculture, of river and sea fishing, and food and processing industry which provided humanity with higher level of food products consumption, the problem of food is not fully solved by humanity.

According to the UN, more than 1 billion people on the Earth starve constantly, 13-18 million people die annually of hunger and starvation, and 35 people die every 24 hours as a result of direct or indirect starvation. As to the quantity of casualties, no other catastrophe on the Earth can be compared to starvation. Only over 1983--1985, more people died in the world of starvation than during World Wars I and II combined (Garthwaite et al., 2015).

Uncertainty of food problem can be explained by a range of causes. Firstly, by high rates of population growth on the Earth, which far exceed the global rates of growth of food volumes. While at the beginning of new era, there were around 200-250 million people on the planet, and the first billion was reached 2000 years later, the second billion was reached 100 years later, and the fifth – 20 years later. At present, annual growth of population is estimated to be 90 million people, and, according to the UN data, in 30 years, the population of the planet will reach 8.5 billion, and in 100 years – 14.4 billion people. On the one hand, this aggravates the food problem, and, on the other hand, strengthens serious load on the natural environment, the main components of which are means of production and subjects of labor for agrarian sector of economy (Jacknowitz et al., 2015).

Secondly, reduction of area of cultivable land and fresh water for irrigated agriculture. During the period of agricultural activity – around 10,000 years – 2 billion hectares of land was lost. During recent 300 years, agriculture lost 700 million hectares, with average annual rate of loss constituting 2.5 million hectares; and during recent 50 years, 300 million hectares was lost, with average annual rate of loss of 6 million hectares.

Modern real losses of productive lands exceed by 30 times the average historic values and by 2.5 times – the volumes of losses during recent 300 years (He, 2015).

Green revolution almost spent its resources, and scientists haven't found the way for quick increase of potential possibilities of newly bred sorts of grain crops, grain legumes, and cereal crops, potato, sugar beet, vegetables, and feed crops. Due to impossibility for use of ecological tools, there is a necessity for the search for new ways of providing food security. In this research, economic mechanisms of managing food security in the system "production-consumption-import" are developed.

2. Subject

The subject of the research is economic mechanisms of managing food security in the system "production-consumption-import" by the example of modern Russian economy.

3. Materials and Methods

Food security is a complex self-organizing system, the mechanism of functioning and development of which hasn't yet received theoretical substantiation. The mechanism of the system of food security is one of its sub-systems, a kind of systemic organization of the system.

Mechanism has one goal – to organize something. Achieving this goal is implementation of the mechanism. Consequently, the sense of mechanism is its goal plus achievement of the goal (sum of necessary regularities and qualities). From the substantial point of view, the system of food security should be viewed as a unity of three components – organizational structure, strategy, and organizational & economic mechanism.

The main substantial (structural) elements of any organizational and economic mechanism are economic agents and relation between them. Economic agents (enterprises, establishments, husbandries) are the subjects of the system of food security.

Implementation of the mechanism of functioning and development of the system of food security is aimed at provision of coordinated cooperation of economic agents, in the process of which the goal of the system is achieved – constant satisfaction of population's need for food products. The study of the mechanism of food security from the positions of systemic approach allows presenting it as an aggregate of:

- Organizational structures, forms, and methods of management, as well as legal norms which help to realize the existing economic laws and ensure the process of reproduction in agroindustrial sphere;
- Interconnected elements in the form of economic subjects and their interrelations;
- Interconnected informational & analytical centers which perform monitoring, evaluation, and development of managerial decisions for provision of food security at macro-, meso-, and micro-levels of agroindustrial system.

The main elements of the mechanism of functioning and development of this system are:

a) state regulation of economy;

b) pricing mechanism;

c) financial and credit mechanism;

d) tax system;

e) economic and commercial accounting;

f) organization of production, labor, and management at agroindustrial complex enterprises;

g) agro-marketing.

We offer the following definition: "Food security mechanism is a self-organizing system of economic agents (enterprises, establishments, households) with peculiar economic mechanisms and public institutes, typical for the whole system, which regulate the activities of economic agents".

Organizational and economic mechanism is a mechanism of adaptation of the food security system to the changes of external environment. There are substantial differences between the processes of current financing and development of the food security system. This is the reason for usage of different approaches for managing these processes and for integration of managing the both processes within single system.

Mechanism of functioning determines the order of interaction between economic agents and government bodies which conduct the management of the food security system; during this process, organizational & managerial, production & technological, and financial & economic interrelations of the system subjects are formed.

The subjects of the food security system enter organizational & managerial interrelations which include development and implementation of agrarian policy, determination of rational list of members of technological chain "production-distribution-redistribution-consumption of agricultural products", development of regulatory act which regulate the activities of economic agents, and setting the sizes and order of formation and use of food reserve.

Production & technological interrelations affect the production cycle and are manifested through division of labor and exchange of the results of activities of reproduction process members of agrofood sphere.

Financial & economic interrelations are manifested in the process of exchanging the results of production in industry and agriculture, distribution of profit from joint activities of the members of reproduction process in agroindustrial complex, and use of loan assets for the development of economic subjects in agroindustrial complex.

The mechanism of development of the system of food security is the totality of the elements of this system which develop and implement targeted actions and procedures for changing its parameters, structure, and features in response to the influence of external and internal factors of environment for the purpose of increasing the functioning and development of the system. On the basis of this definition, it is possible to conclude that the mechanism of development is an adaptive mechanism which allows taking into account the influence of external environment factors.

The mechanism of development of food security system determines the range of requirements and peculiarities of formation of its structures (targeted, functional, and organizational), the performance of which requires:

-formulating the list of requirements to system's goals;

-determining the model of goals structuring;

-determining parameters of targeted function;

-performing quantitative and qualitative evaluation of goals;

-determining the variety of development goals in the variety of goals of food security sub-system;

-determining the peculiarities of formation and implementation of system development goals;

-determining the goal implementing of managing sub-system and management object;

-determining the peculiarities of goal-setting system;

-determining the list and sequence of performance of general functions of management;

-viewing the content of main stages of formation of organizational & economic mechanism of development of food security system.

Modern food situation of Russia can be characterized by chronic loss of food and incapability or lack of her authorities' wish to solve this problem. It has been 21 years since the beginning of agrarian reforms, and socio-economic position of agriculture and modern state of economic accessibility of food products for all groups of population do not give any reasons for optimism. However, estimates of the reduction of food production are different, but, whatever standards are used for evaluation, the scales of the reduction are huge.

At present, 50 regions of the Russian Federation with population of more than 87 million are beyond the criteria of food security; as to milk and dairy products – 28 regions with 52.8 million people. At that, in 50 regions with population of 78 million people, the consumption of meat products per capita is lower than the average one in Russia; the consumption of milk per capita is lower than the average one in Russia in 48 regions.

It should be noted that the number of regions with dominating import of food is growing dynamically, and this significantly aggravates the situation with food security of the country and strengthens its import dependence. Consumption of main food products in developed countries of the world is characterized by the following data.

As is seen from Table 1, only the people of Japan consume less meat than the Russians. At that, it should be noted that the Japanese consume 55.3 kg of fish and sea products per year, while the Russians – only 9.3 kg.

In the internal market of food products, there is a quick growth of retail prices and the share of large trading chains which set high trading margins, which cannot but influence the economic accessibility of food – especially, for lowly-paid category of population. Trading margins for food products in Russia constitute 25-40%, while in Canada, China, and Belarus they are regulated by law and do not exceed 12%, and trading margins for socially important products do not exceed 8%.

Table 1. Consumption of main food products in developed countries, kg per capita, 2014 (Maitra & Rao, 2015)

Product	Russia	Germany	USA	France	Japan
Meat and meat products	46	86	115	91	45
Milk and dairy products	229	435	312	426	94
Butter	3.5	7.1	2.0	8.6	0.8
Eggs	210	224	233	282	320
Fish	9.3	14.1	10.5	20.0	55.3
Sugar	33	33	30	35	21
Oil	8.4	17.0	24.6	18.8	14.6
Potato	130	75	64	84	102
Vegetables and gourds	79	87	111	130	123
Fruits and berries	33	129	101	84	60
Bread products	118	77	103	82	118

There is ongoing process of property stratification of society. In the population groups with the least resources per capita, as compared to group with the most resources, the consumption of meat and meat products is lower by 2.5 times; milk and dairy products – by 2.1 times; eggs – by 2.7 times; vegetables and fish products – by 2.2 times; fruits and berries – by 3.9 times. While in 1990, the average daily ration in Russia was 3,420 calories, over the recent years it reduced to 2,500-2,700 calories, with Food and Agricultural Organization's recommended level of 3,000 calories per day. At that, there has been the reduction of the most valuable in the energy aspect products – meat and dairy products, fish and eggs.

Food independence of the RF is the state of the country's economy, at which the cease of import of food products into the RF does not lead to food crisis, and annual production of the most important food products constitutes at least 80% of the annual need of population for them, according to physiological norms of nutrition.

Physical accessibility of food is the availability of food, guaranteed by the state, on the whole territory of the country and at any moment in volumes and assortments which satisfy and correspond to payable demand of population.

Economic accessibility of food is the level of buying capacity of population with existing structure of consumption, pricing system, and level of incomes, social benefits and subsidies which provides the possibility for the population's purchasing the main types of food according to the recommended norms of nutrition.

The doctrine of food security of the Russian federation determines threshold values of food security. Share of the Russian agricultural raw products and food in the total volume of sales in the domestic market should constitute not less than: corn and potato – 95%; sugar – 80%; oil – 80%; meat and meat products – 85%; milk and dairy products in equivalent of milk – 90%; fish and fish products - 80%. At that, the indicators of the Food and Agricultural Organization for the allowable share of import of food products of 17% were taken into account (Popkova & Tinyakova, 2013a).

For example, the USA and EU proceed from the necessity for providing 100% of food security. Even Japan, where the area of tilled soil per capita is less than in Russia, provides her population with own rice by 100%, and with other food products – by 45%, despite the fact that cost of rice production is 7 times higher than in other rice-producing countries (Popkova & Tinyakova, 2013b).

The goals and tasks of providing food security include the following:

Food independence in parameters, set by the Doctrine of food security of the RF;

Sustainable development of rural areas, creation of favorable and attractive conditions for rural population;

Modernization and transition to innovational model of agroindustrial complex development;

Reproduction and increase of the use of land and other natural resources;

Development of small business patterns and cooperation, as an important factors of economic viability of Agricultural manufacturers and provision of their access to agrofood market.

Russia cannot hide from the issue of providing the population with own food. However, this path will be a long one, and expenses will be huge. In 2011, the total investments into agricultural economy and social sphere constituted a pathetic sum of RUB 160 billion. The investments are huge, and the rates are growing annually. Still, I comparison with leading countries of the world, these investments are very small (Mazaeva & Rogachev, 2012).

Thus, as to the cost of food, our budget investments constitute 5.4%, while in the USA – 18%, Norway – 72%, Japan – 58%, the EU – 37%, and Canada – 21%. The society has to understand that there is no independent prosperous democratic state of the decent level of the 21st century without own highly developed agriculture and food industry.

4. Results

The indicators of socio-economic development of agriculture are those which express quantitatively its sense, possess a high level of sensitivity and variability, and are capable of warning the state and market subjects of possible dangers in the sphere of food provision (Popkova et al., 2013):

- volume of gross output of agriculture and food, per capita;
- gross corn yield per capita;
- financial & economic situation;
- share of investments into main funds;
- share of imported food in the total volume of food resources.

In order to give adequate responses to modern challenges, Russia has to start developing additional measures for quick recovery of domestic agroindustrial production and to introduce corresponding changes into government's plans for short-term and long-term. Primarily, this refers to food import substitution – especially, cattle breeding products.

We offer two approaches for solving the food problem under the conditions of counter-sanctions. Firstly, cluster approach. Cluster is a key tool for managing territorial agroindustrial policy. In Russia, this theory is not thoroughly developed. In practice, this is manifested in insufficient companies' integration, weak use of modern production technologies, and ineffective antimonopoly policy.

Secondly, the formation of growth poles, or economic cores, is of great interest. Implementation of the strategy on the basis of "cores" requires realization of the following measures (Mazaeva, 2012):

- change of paradigm of managing agroindustrial complex in the direction of clear structuring of elements of economic mechanism;
- increase of areas of regulation and participation of regional budgets in the capitals of integrated companies;
- increasing the status of regional agroindustrial policy, etc.

The main form of state support for agroindustrial complex are federal and regional targeted programs which stimulate commodity production of the types of products which are necessary for saturation of food market and which are competitive enough.

The top-priority direction of agroindustrial complex development is wide usage of progressive technical means and new technologies in crop production, cattle breeding, and processing industry. It may be the means for large growth of food production.

In all developed countries, the state, with the help of various economic and financial actions and means (including the system of subsidies and compensations, relieving taxation or tax remissions, reduction of tariffs for resources used in agriculture, system of crediting and insurance with budget compensations, etc.) conducts constant support for agriculture. This allows not only improving the food provision of the population but exporting large volumes of agricultural production and food products.

The development of production potential of agroindustrial complex requires the national program of stimulation of food export with the usage of global experience. At present, the state provides minimal support for export-oriented manufacturers, while such forms as export subsidizing, crediting and credit insurance, and informational & consultative services are used by all states and do not contradict the rule of the WTO (Rogachev et al., 2014).

Development of export productions will allow attracting investors in the spheres of agroindustrial complex which now are considered to be unattractive for investments. Investments in the stimulation of agroindustrial export are paid off quicker than in the spheres which are oriented primarily at the internal market.

For reasonable selection of the strategy of actions for preventing or neutralizing the emerging threats, it is necessary to conduct expert surveys for the purpose of determination of the level of their influence on the consumer market and evaluation of probability of their emergence.

On the whole, despite the influence of negative factors, most of exports evaluate the perspectives of growth of main spheres of agroindustrial complex in mid-term optimistically – under the condition of certain efforts, which, undoubtedly, will influence the inflow of investments into this sphere of economy.

Development of the Russian production is a main path for reducing inflation rates, growth of income, and rationalization of the consumption structure of the Russian population. The development of clever protectionist policy for protecting the Russian internal market with the use of mechanisms of custom duties is urgently required.

While solving the problem of necessary volume of subsidies for agricultural production, one should proceed from normative cost and profitability of product, the size of which will allow enterprises providing the necessary average annual rates of growth of agricultural production and implementing high-tech equipment for manufacture of competitive agrarian products.

The state strategy of regulation of particular spheres of agroindustrial complex, on the basis of generalization of experience of competitive struggle, should be determined in view of the stage of the sphere's economic cycle. The most important indicators which allow identifying certain stages of economic cycle (growth, fall, decline) of particular spheres of agroindustrial complex and enterprises' capability to invest assets into new equipment are: volume of corporate profit of enterprise before taxes and volume of corporate profit after taxes and undistributed profits, i.e., company's profit after payments and distribution of dividends.

Monitoring of the first two indicators should be performed every quarter. Reduction of the volume of corporate profit of the sphere after taxes during three quarters is an indicator which allows forecasting the reduction of rates of economic growth or start of decline in this sphere.

Positive expectations of the growth of agroindustrial sector of economy are caused by effective government decisions, including the ones as to export and import of food. There's a great concern with the market being influenced by large volumes of imported products which influence food market, thus increasing the insecurity of the Russian manufacturers.

5. Discussion

The conducted analysis allows stating the necessity for provision of absolute importance of internal national interests over external ones and reduction of internal food market's dependence on the changes of global situation. At that, limited protectionism is used not for artificially preserved relative competitiveness but for creation of conditions for development of agroindustrial complex of the country in view of market laws and provision of accessibility of food for all population groups. This requires the state regulation of import of agricultural products, raw materials, and food, which is conducted primarily by economic measures.

While viewing the question of joining the WTO, it is necessary to protect Russia's right for economically reasoned protectionism and state support for agriculture which primarily includes preservation of the level of budget subsidies and other measures of state support, required for stabilization and development of agroindustrial complex, preservation of required level of internal market protection, right for subsidizing the export of agricultural products, raw materials and food for increasing the competitiveness of domestic production in the global market. Support for the Russian manufacturers in the internal market should include the following measures:

- monitoring of the situation of the global and Russian food market and timely reconsidering the rates of import customs duties;
- differentiation of rates of import customs duties on agricultural products, raw materials, and food, depending on the level of their processing;
- expansion of use of tariff quotas for certain types of imported goods; activization of investigation of damage to domestic manufacturers of agroindustrial complex, and the use of protective, anti-dumping, and compensational measures, of quotas and licensing of import of certain types of agricultural production, raw materials, and food;

- development of infrastructure of food market and increase of its accessibility for all manufacturers of agrofood sphere;
- prevention of setting transregional trading barriers, including during purchase of agricultural raw materials and food for budget organizations and establishments, which will improve the physical accessibility of food for population in various regions;
- development of the system of targeted aid (depending on the level of expendable income of family) for the most destitute population groups and organization of full and complex analysis of evaluation of the food security state – "food monitoring" of the population;
- introducing changes and revisions to current regulatory acts for the purpose of creation of single state body for control of the quality and security of food products, through uniting departments which deal with development of standards with departments responsible for their observation;
- stimulating transition from manufacture of "impersonal" food to the issue of domestic food products under trademarks which will increase quality and competitiveness of products of the Russian manufacturers.

Development and implementation of effective strategy for development of food market, formation of sustainable economic ties between Russian manufacturers and consumers of agricultural products, as well as improvement of the system of products movement towards consumers will allow providing the food security of the Russian Federation and implementing national interests of Russia in the globalizing world.

6. Conclusion

Managing the processes of provision of food security within the process of increasing the level of economic security of agroindustrial complex at all levels requires the policy aimed at overcoming internal and external threats which should include the following measures:

- monitoring of factors determining threats to food security, which will allow forecasting crisis phenomena in agroindustrial complex and determining their influence on food security of the country. In our opinion, this will require changing the functions of the Federal State Statistics Service in the sphere of collection, depth and forms of coverage of statistical observation objects;
- in view of specifics and peculiarity of geographical position of the subjects of the RF, their zonality, and specialization, leading R&D establishments of Russia should create a system of criteria and parameters (threshold values) of food security. This will allow evaluating the self-sufficiency of the Federation's subject and implementing complex of measures, aimed at preventing or overcoming the threats to food security of Russia;
- creation of conditions for easy-term loans for economic business subjects of agroindustrial complex, their interest in smooth system of interrelations "production-processing-final products sale";
- development of mechanism for elimination of price disparity, which, in our opinion, is the biggest threat to provision of food and economic security of agroindustrial complex;
- development of rural infrastructure and increase of the educational level, which will allow forming effective HR potential;
- achievement of integration of science into production – as practice shows, new species of animals and plants, and new types of equipment are still not available for agricultural manufacturers;
- changing the order of investing into production and of taxation of business subjects of agroindustrial complex.

Thus, economic security of agroindustrial complex and food security of the Russian Federation should be based on effective economy in the technological chain "manufacturer of means of production for agroindustrial complex – production of agricultural products – processing of agricultural products – final products sales".

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Actual Issues of Planning of Well-Balanced Development of Innovative & Investment Activities

Nadezhda A. Serebryakova[1], Yuriy A. Salikov[1], Olga Y. Kolomytseva[1], Tatyana A. Pakhomova[1] & Natalya V. Grishchenko[2]

[1] Voronezh State University of Engineer Technologies, Voronezh, Russia

[2] Voronezh Institute of Cooperation (department) of Belgorod University of Cooperation, Economic, and Law, Voronezh, Russia

Correspondence: Nadezhda A. Serebryakova, Voronezh State University of Engineer Technologies, 19 Revolution Av., Voronezh, 394044, Russia. Tel: 7-910-749-7142. E-mail: nad.serebryakova@mail.ru

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Abstract

The modern factors of development of the country's economy require interdetermination and interdependence of the study of issues of planning of balance of innovative and investment activities, which has a very important meaning for economic systems and determines the scientific interest in this topic. The purpose of this article is the study of theoretical and methodological aspects of planning of well-balanced development of innovative and investment activities and development of practical recommendations, aimed at the increase of efficiency of economic systems. In order to achieve this purpose, the authors used economic and statistical methods of research and methods of economic & comparative analysis. Methodological and practical development was based on the following approaches: process, program-oriented, complex and structural & logical, and methods of comparison and modeling. The authors distinguish the determinants of planning of well-balanced development of innovative and investment activities of economic systems, which, unlike the existing approaches, allowed forming the system of targeted landmarks and limitations which guaranteed the optimal conditions for effective functioning and development of economy of macro-, meso- and micro-levels; the authors offer a program-oriented approach to the well-balanced development of innovative and investment activities of economic systems, the novelty of which consists in the fact that it is used as a modern technology of planning which facilitates solving tasks of limited and creative type, which, in its turn, creates possibilities for creation and support for balance between the volume of investments and development of investment activity. Besides, these recommendations as to formation of balance of investments for the purpose of increase of efficiency of innovative activity contain methods and means for solving problems of well-balanced development and allow implementing analytical, synthetic, and practical interests of all economic subjects in the process of systemic adaptation to the changes of external conditions. The recommendations, formulated in the research, may be used in the work of federal and regional authorities; in the process of improvement of innovative and investment activities of economic subjects of micro-level.

Keywords: management, balance, innovations, investments, planning

1. Introduction

Innovations and investments, by virtue of their nature, are oriented at long perspective, which cannot be viewed in isolation from planning their well-balanced development. Economic systems of macro-, meso-, and micro-levels have to be able to develop and implement the effective innovational policy which is founded on the process of planning of well-balanced development of innovative and investment activities. The necessity of provision of balance is pointed out in orders of the range of federal and regional governing documents and programs which stimulate the development of economy. The balance of innovational and investment spheres of the economy is an essential condition for intensification of production, increase of its efficiency, provision of high growth rates, and solution of many other important socio-economic problems.

The factors which caused the aggravation of the problem of the economy's balance include the accumulated disproportions of intersectorial and intraindustry nature, which emerged dude to specifics of the process of reproduction at the previous stages (policy of maximization of growth rates of leading productions by means of

sectors of economy which were considered to be less important; emphasis on extensive sources of economic growth; insufficiently effective use of external economic ties and, in particular, of loaned resources, which leads to tension of balances of payment, etc.).

At present, there is a growing importance of using the methods of preservation of balance under conditions of quickly changing proportions. The need for intensive change of the structure of economy strengthens the possibility of temporary disproportions and, consequently, the necessity for accurate account of the society's resources and their operative management, and for improving the mechanism of their distribution. This refers to all important factors of reproduction: work force, capital investment, and natural, material, and consumer resources (Boudeville, 1966).

Solution of the actual problem of the country's economy's transition to innovational path of development is not possible without planning of well-balanced development of innovative and investment activities. Despite the significance and importance of the task before the country, this problem is not thoroughly studied in economic literature and various scientific research: there are no theoretical provisions for planning the well-balanced development of investment and innovational activity of economic systems; factors and tools of the balance of innovative and investment activities are not determined; the system of indicators of evaluation of balance is not developed. All of this predetermines the actuality of the study of issues of development of innovative and investment activities of economic systems.

The planning tools help to determine and provide the task-oriented development of any economic system. At present, under market conditions, there is no unified planning at the scale of the country; new property forms appeared, and new economic connections between manufacturers and consumers emerged, which are regulated by the Civil Code of the Russian Federation.

The planning methods are the foundation for joint management of all economic systems. After the first stage, there goes the second one and all the others, which relate to the production or realization of goods and services. In authors' opinion, it is impossible to connect or cooperate all the stages of production process without using the methods of planning.

Humans faced the need of planning their actions very long ago, back in ancient times. Any understanding of an action requires setting of the goal. Then it is necessary to choose means and methods of achievement of the set goal. Eventually, planning was widely acknowledged.

In the 19th century, European and American scientists began developing and generalizing planning. The founders of the planning methods in economic are: Frederick Winslow Taylor (1991), who wrote, "There will be no rich and poor countries – they will be educated and ignorant ones", thus implying that the source of knowledge is planning, as a management function; Henry Ford (1924), who opened wide possibilities for use of planning, its experience, and, in particular, the principles of organization of mass production of consumer goods, in methodological aspect; Henry Laurence Gantt (1917), who started to work with F. Taylor and the diagram that he offered is still actual for management and provides a graphic illustration of the plan of works; Henri Fayol (1923), who defined planning as the most important administrative function, limited by boundaries of specific economic system of micro-level.

Planning at the level of state was first used in Russia in 1917, after the October Revolution. All enterprises became the property of the society, which led to many questions as to the state's managing them. This situation supposed determining forms, methods, and tools for economic management of meso- and macro-level of economy. As a result, the work of state authorities was organized, which developed the plans of the country's economy (Busarina, Morkovina, Budkova, & Kolesnichenko, 2014).

In the USSR, the use of concentrated planning showed the perspective of strategic management and planning at the level of the country, which allowed preventing unemployment and crises. The practice of planning in the USSR in 1930s was used by the economist John Keynes (1978), who substantiated the significance of state regulation of the economy. After that, programing began to be widely used within planning in many countries of the West in the practice of economy.

Principles of planning of macro-, meso-, and micro-levels of economy were founded and tested in the USSR; in spite of that, all modern methods of planning, like "Just in time" (Precisely in time for workers, 2008), MRP (Planning of needs for materials, 1999), ERP (Kaniran, 2005), and others, were created and used abroad.

The sense of the process of planning consists in specific goals and tasks of development of all economic system in the specific period of time. The meaning of planning opens in the possibility to use all factors (external and internal) which guarantee the favorable conditions for effective functioning and development of economic

system. Planning supposes formation of aggregate measures which determine the algorithm of achievement of set goals in view of possibilities of the most effective use of resources by economic system. Necessity for planning under modern conditions of economy results from huge size of production and realization and from requirements of scientific and technical progress, i.e., it must fully take into account and use innovations in science and technology (Chebotaryov, 2007).

The balance of the development of innovative and investment activities of economic systems supposes harmonization of all components of these processes, in particular: legal base for innovative and investment activities; innovative and investment policy of macro-, meso-, and micro-levels; investment and innovative potential of economic systems; measures which facilitate the increase of innovative and investment activity of economic systems, etc.

Formation of effective cooperation of investors and economic systems is one of the most important vectors of development for usage of investment resources in innovative activities. Creation of the mechanism of planning of balance of innovative and investment activities supposes the use of approach which will allow ensuring harmony of goals and structuring of indicators.

Balance of innovative and investment economic systems supposes the determination of the most effective paths of realization of investment into innovative activities in two projections. Firstly, determining the objects of innovative activities and, secondly, forming the sufficient volume of investment resources, in view of priorities of achievements of scientific and technological level of economic systems which ensure the issue of innovational products, evaluation of need for innovative and investment projects, in quantitative and qualitative measurability of scientific & technical, investment, and innovational potentials.

Implementation of planning of balance supposes the programs of development of investment and innovational processes and the most accurate evaluation of their implementation efficiency. Innovational development of the Russian Federations should be in balance with investment processes, which will allow combining efforts and resources of the state and entrepreneurial sector of the economy for their development.

2. Methods and Materials

Under limitation of investment resources, the most perspective way of recovery and provision of the balance is the increase of efficiency through use of innovations. That's why the issue of ties and relations between balance and effectiveness, as economic categories and specific economic parameters, is of special interest.

The main economic precondition for transition to innovative path of development and quickening of scientific and technical progress is the change of existing proportions which allows deleting tension in economics, caused by disproportion between the scales of simultaneously implemented goals and programs, on the one hand, and existing resources and level of rationality of their use, on the other hand – as well as by disproportions in the structure of the resources. At that, analyzing the reasons for existing problems of imbalance of innovative and investment spheres, one should understand the most important thing: these problems are caused not so much by globality of the current tasks, as by insufficiently effective use of possible innovations and investments (Sibirskaya, Gryshchenko, & Syroizhko,2014).

Thus, on the one hand, the balance may be reached by the full and effective use of innovative and investment spheres of economic systems, and, on the other hand, balance depends on the right qualitative and quantitative ratio of not only innovational and investment activities of the economic systems.

An important role in strengthening of balance belongs to other links of economic mechanism. It is necessary to fully refuse from orientation at gross indicators, which do not characterize the final economic results and inevitable lead to violations of balance, creating the increased demand for various resources. They should be replaced by indicators which reflect the level of satisfaction of needs and efficiency of resources use. The consistent orientation of planning and economic levers at interests of consumers is an important and necessary link in provision of balance of the economy in whole. Besides, it is advisable to form a system of planned reserves at various levels of economy, as a means for protection from unpredicted changes (Lundvall, 1992).

Balance of innovative and investment spheres should be comprehensive and exclude the balance in certain areas by means of its violation in the others. However, this requirement is difficult to realize due to limited resources. As a result, constant maneuvering of resources becomes one of the main functions of planning. Depending on economic, social, or political situation, and on current purposes of development, on ideas of optimal state of economic system, which are characteristic of one or the other stage of economic growth, the priorities change, and current resources are taken from certain spheres and sectors of economy into the others.

Under condition of limitation of resources, their shifting for the purpose of provision of balance in one area by means of temporary or full loss of the balance in another area cannot be considered an anomaly or referred to wrong economic methods of management. It seems that necessity for maneuvers will always exist.

However, the re-orientation of resource flows should be performed, taking into account its consequences for the economy in whole and its areas which are currently considered to be less important. At the same time, the deliberate change of proportions in the economy should not be accompanied by shifts which mean the violation of balance at various areas of economy, as a result of weak control of the society of economic processes. This requires searching and using indicators which fix the moment, level, and factors of balance violation, disparity of actual and planned proportions, etc.

The phenomena of imbalance of development of innovative and investment spheres do not result from their sense, they do not reside in it, but are the result of subjective reasons, or the result of specific objective factors of the current moment, or as a consequence of conditions of the global economic scale.

Supporting the balance is complicated by some objectively caused unfavorable tendencies in the dynamics of efficiency of the resources use, caused, in particular, by lack of potential economic effect of improvement of traditional types of technology.

However, as the experience shows, the main reasons for violation of balance are subjective ones. This is a deviation from requirements of scientifically substantiated planning, consisting in implementation of concepts of development of economy which supposed long preservation of previously reasoned top-priority position of some spheres and areas of production at the expense of others, or the ones that were initially based on insufficiently substantiated ideas on necessary priorities; in underestimation of economic and social significance of complex satisfaction of requirements of society and corresponding development of the spheres of economy; in unrealistic planning of certain indicators, especially of the growth of production efficiency, and toleration of elements of clear imbalance of the plans (Serebryakova, Sibirskaya, Stroeva, Petruchina (2014).

The reasons for violation of the balance include also deviation from planned tasks in the course of their fulfillment (the most typical deviation is overspending resources at the fulfillment of the production issue plan) and insufficient efficiency of plan and economic bodies at elimination of outlined disproportions.

Elimination of imbalance of planned decisions is one of the most important directions of improvement of planning, prevention of subjectivism in all its forms, and closing the gap between economic goals and real possibilities of innovative and investment spheres.

Planning of balance is the process which facilitates the changes for the better. Regardless of the sphere, in which planning is conducted, it still is performed through development of complex measures for achievement of the set goal.

Study of various methods of planning of innovative and investment activities and generalization of information allowed determining the main methods of planning of the development balance (Table 1).

Right planning of the well-balanced development of innovative and investment activities will lead to reduction of time required for complex projects and optimal use of resources. Use of the methods for planning of the balance will allow optimizing the project, determining the least possible time of realization, and using the capital more rationally; solving such problems as efficiency, management, control, and minimization of certain investment risks.

Table 1. Methods of planning of the balance of the development of innovative and investment activities

Methods of planning of the balance of the development of innovative activities	Methods of planning of the balance of the development of investment activities
1	2
Methods of conservative planning of the balance of the development of innovative activities – facilitates the preservation of the level of work indicators with the help of integration of previous methods, i.e., helps to obtain better, or equal, results in the planned time period than in the previous	Methods of structural planning of the balance of development of investment activities are based on the division of the program into specific operations. The following stage is evaluation of the length of operations and building a model where any movement of constituent elements of the model shows their activities. This model is a graphical illustration of connections and relations between all operations of the program. With structural planning, this model helps to conduct a detailed analysis of all

time period.	operations and correct changes in the structure of the program before its realizations.
Methods of adaptive planning of well-balanced development of innovational activity – aimed at receiving better results through the use of previous experience of use of means and methods through their adaptation to changing conditions.	Scheduling method of planning the balance of development of investment activities supposes development of a schedule which determined the start and the end of each operation, as well as their cooperation with other operations of the program. This schedule helps to determine the most critical operations, which require the most attention after the end of the program. In view of non-critical operations, the schedule helps to determine the time reserves to be used in case of untimely fulfillment. If the results of the projects are satisfying, it should be finished – otherwise, the further analysis for its improvement is required.
Program-oriented method is used in unclear and problem situations and is oriented at harmonization of goals and tasks and all types of resources and allows optimizing and coordinating the activities with the help of various criteria of alternative means of solving the currents problems.	Program-oriented method of planning the balance of development of investment activities allows using the model and schedule simultaneously for preparation of reports on results of fulfillment of the programs. If the result is not satisfying, there is a necessity for correction of the model and the schedule.

The practical use of these methods will allow determining the development of problem situations which have a long-term nature, reducing the time of realization of investment project, automatizing the process of determining the parameters of realization of investment project, possessing information about the state and stages of project's implementations, and calculating parameters of investment project in view of already performed works in the course of project's implementation.

3. Results

The dynamics of economic development of economic systems directly depends on the level of innovative and investment activity of economic systems. That why there is a need for information which allows not only analyzing the economic activities but facilitates the development of managerial decisions as to elimination of disparities between inflow of investments and innovative activities. This information can be obtained with the help of monitoring. Is can characterize the processes in innovational and investment spheres of economic systems and, using the analysis, determine the reasons that prevent their dynamic development. Its use allows determining directions as to activization of corresponding directions of activities in economic systems. The received data can be used for completing the information about the state of investment climate and efficiency of innovative activities. The monitoring data allows suggesting measures for activization of investment and innovative processes in economic systems for quickening of dynamics of economic and social development and determining the volume of necessary investment resources for the development of innovative activities (Sibirskaya, Stroeva, Khokhlova, & Oveshnikova, 2014).

The main purpose of monitoring of innovative and investment processes is systematized preparation of the data, based on the existing and additionally prepared informational resources which will allow conducting the analysis of economic activities of the systems and evaluating the real contribution into the process of planning of the balance of innovative and investment spheres.

This purpose supposes a range of tasks, required for its achievement:

– Forming new approaches to receiving and analyzing information which characterizes the process of attraction of investments into economic systems of various types (macro–, meso–, and micro–) and implementing the projects which allow solving the problems of innovative activities;

– Preparing the analytical information which is able to answer the question "How much investment assets should be attracted into the economy of the system, for the innovative activities to earn profit?";

– Creating informational provision which will allow not only conducting the wide analysis of planning of balance of innovative and investment activities in the economic systems but also evaluating the real contribution into the dynamics of evaluation of efficiency of activities for creation of conditions for improving innovative and investment climate;

– Offering instrumentarium of managerial activities which allows analyzing deeply the real situation and determining the mechanism of stimulation of these processes in activization of corresponding directions of activities.

Formation of effective cooperation of investors and economic systems is one of the most important vectors of development in the usage of investment resources in innovative activities. Creation of the mechanism of planning of the balance of innovative and investment activities supposes the use of the approach which will allow ensuring the harmonization of the goals and structuring of indicators.

Let us conduct the analysis of the existing state and determine the cause-and-effect relations between innovative & investment spheres of activities of macro-, meso-, and micro-levels.

Let us analyze the structure of investments into non-financial assets. The main part belongs to investments:

– into main capital – approx. 98.4 – 98.8 %;

– investments into objects of intellectual property – 0.4 – 0.5 %;

– investments in other non-financial assets – 0.4 – 0.5 %;

– expenses for R&D – 0.3 – 0.4 %.

Investments into main capital as to the types of main funds are presented in the form of a diagram (Figure 1).

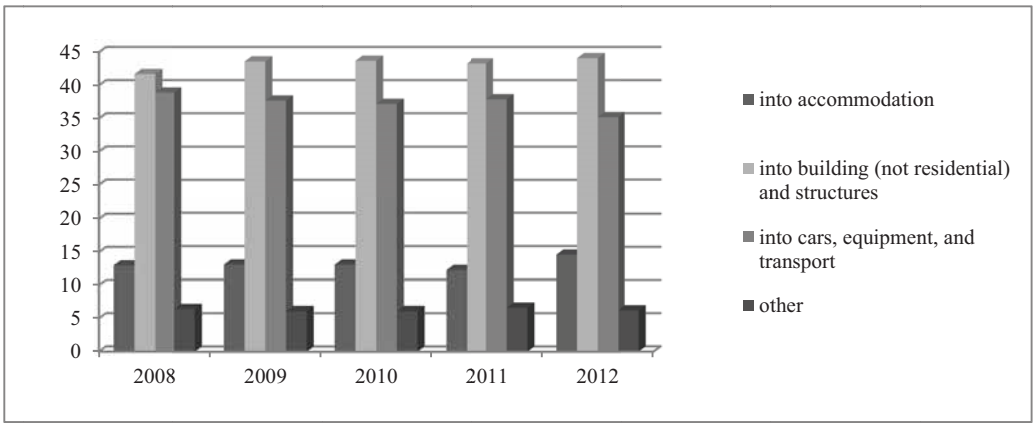

Figure 1. Investments into main capital as to the types of main funds

As is seen from the diagram, the structure of investments didn't change much over 5 years (2008-2012).

Let us present the investments into the main capital as to types and forms of property in the form of diagrams (Figure 2 and 3).

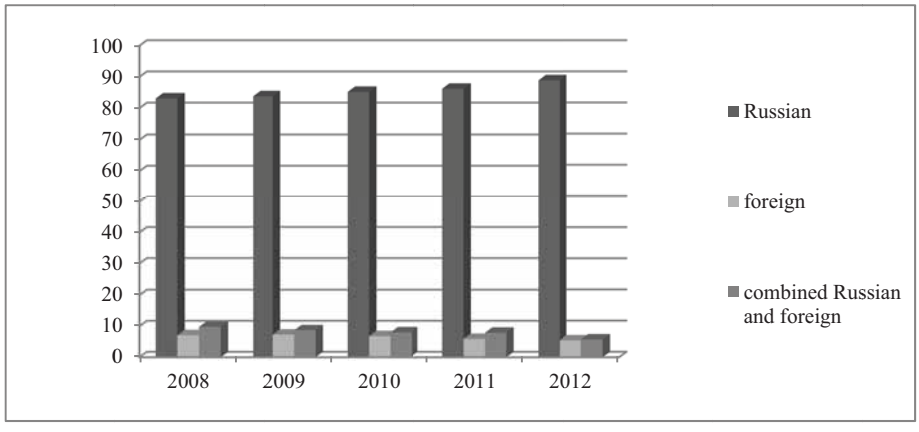

Figure 2. Investments into the main capital as to types of property

This diagram shows that mainly Russian sources invest into the Russian economy and its main capital; the next diagram proves this.

Total investments into the main capital in 2008 in existing prices constituted RUB 6,716,222 million, which is 122.7% as compared to the previous year (in fixed prices); in 2009, the investments equaled RUB 8,781,616 million in existing prices, which is 109.9%, as compared to the previous year (in fixed prices); in 2010, the investments equaled RUB 7,976,013 million in existing prices, which is 84.3%, as compared to the previous year (in fixed prices); in 2011, the investments equaled RUB 9,152,096 million in existing prices, which is 106.0%, as compared to the previous year (in fixed prices); in 2012, the investments equaled RUB 10,776,839 million in existing prices, which is 108.3%, as compared to the previous year (in fixed prices).

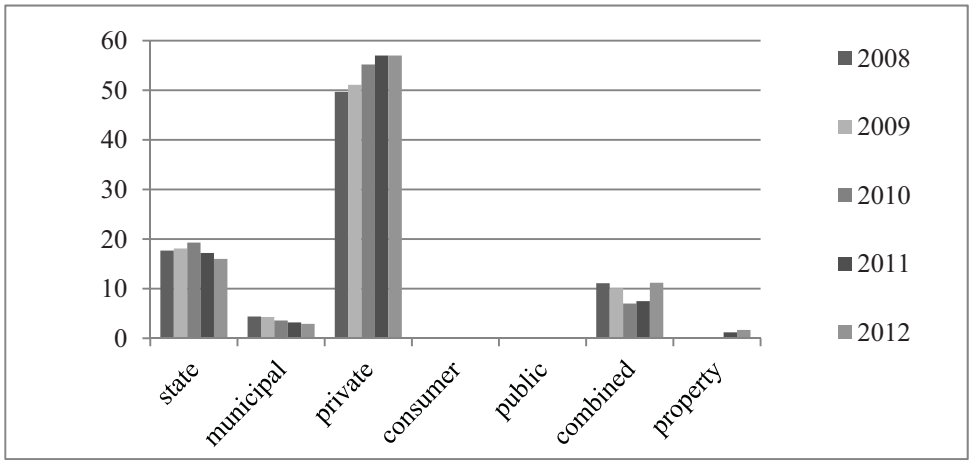

Figure 3. Investments into the main capital as to property types

As is seen from Fig. 3, the volume of state investments over the last five years didn't change much; the volume of investments into the main capital from municipal sources decreases, but there is a positive dynamics of private investments from 48% in 2008 to 57% in 2011, with the latter volume preserving in 2012; the organization and enterprises of consumer cooperation invested practically nothing, as well as public and religious organizations; volume of investments from combined sources with the state share reduced a little over 2009-2011, but there was a positive dynamics in 2012; the newly emerged state corporations began actively investing into the main capital in 2011-2012.

Let is present the investments into the main capital according to the sources of financing in the form of a diagram (Fig. 4, 5, and 6). Figure 4 shows that the main capital is formed by means of attracted assets, and the next figure shows the sources of own and attracted funds over the period of 2008-2012.

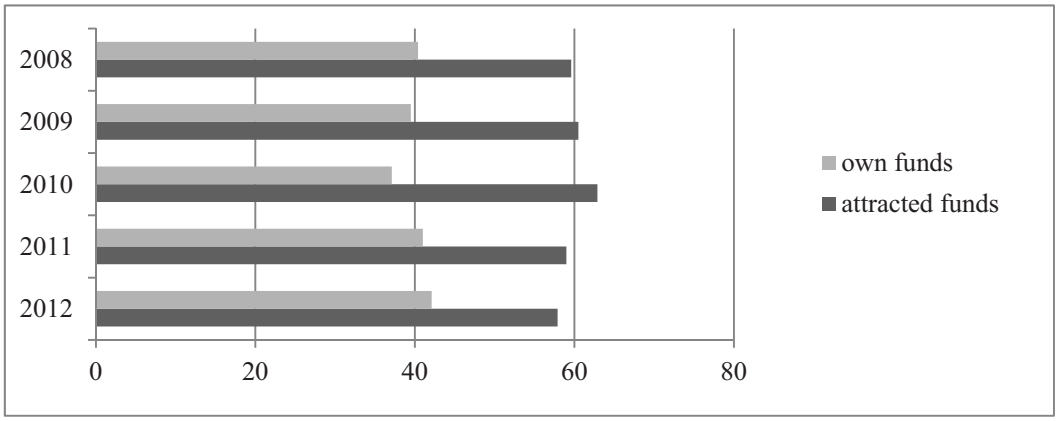

Figure 4. Investments into the main capital according to sources of financing

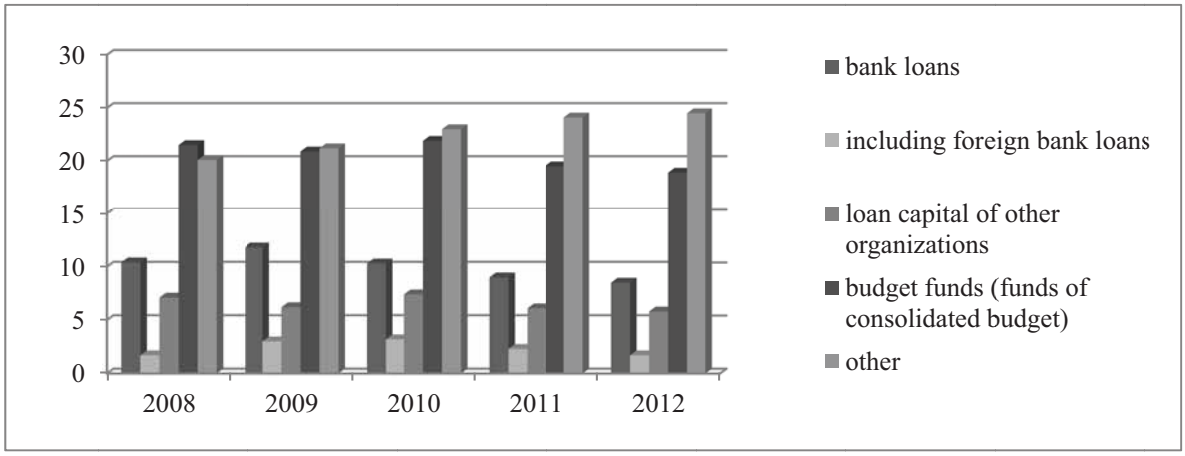

Figure 5. Investments into the main capital according to sources of financing by means of own funds

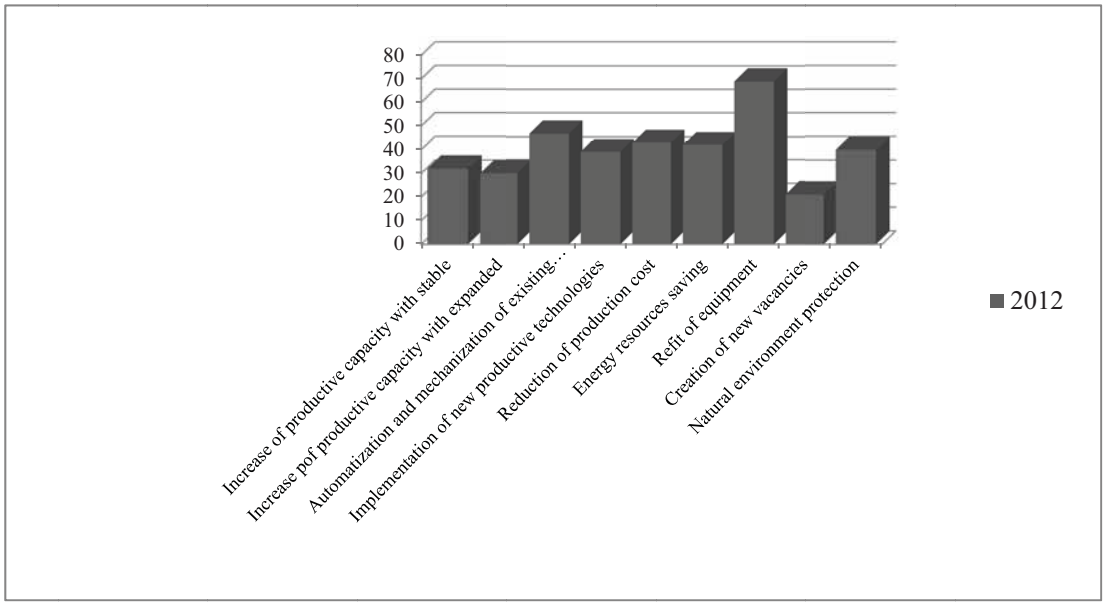

Figure 6. Investments into the main capital according to sources of financing by means of attracted funds

Distribution of organizations according to evaluations of purposes of investing into the main capital (based on the data of selective study of investment activities of organizations) in percentage of the total number of organizations – Figure 7.

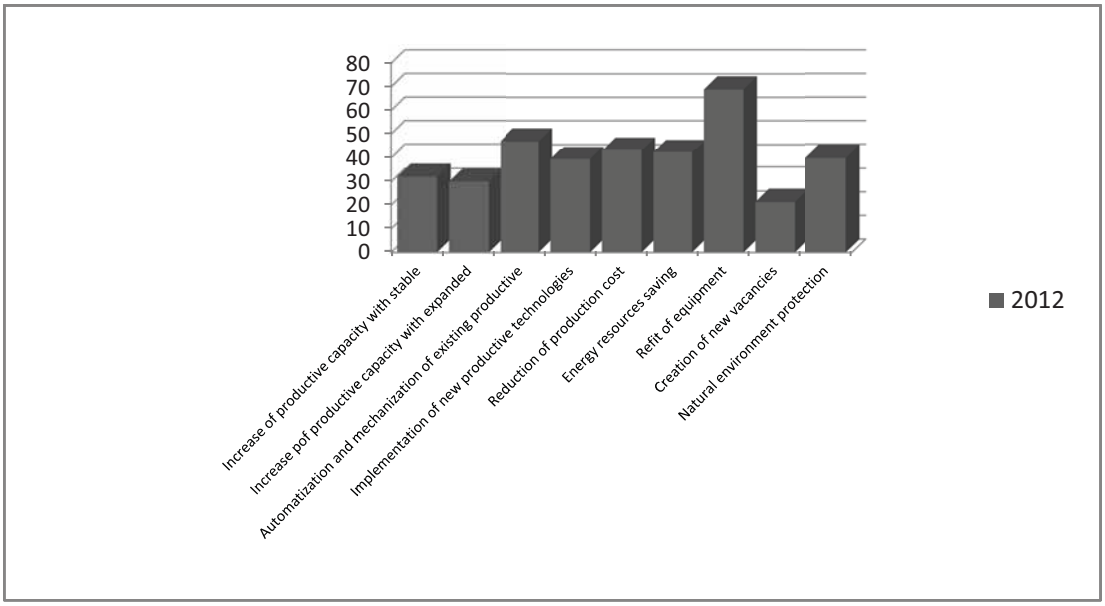

Figure 7. Distribution of organizations according to evaluations of purposes of investing into the main capital for 2012

Having analyzed the data, presented in the above figures, it is necessary no mark that the Russian companies do not have the purpose of investing into innovative developments.

Internal expenses for research and development in whole in the Russian Federation are presented in Table 2.

Table 2. Internal expenses for research and development, RUB million

Internal expenses for research and development:	2008	2009	2010	2011	2012
in existing prices	371,080.3	431,073.2	485,834.3	523,377.2	610,426.7
in fixed prices of 2000	5.57	5.49	6.07	5.87	5.89
as a percentage of GDP	1.12	1.04	1.25	1.16	1.12

Thus, internal expenses for research and development as a percentage of GDP constitute 1.04-1.25%. The given below Table 3 shows that absolute volume of internal expenses for research and development in Russia is almost 21 times smaller than in the USA, 7.83 times smaller than in Japan, and 4 times smaller than in Germany.

Table 3. Comparison of internal expenses for research and development in Russia and foreign countries

Country	Total, USD million, in 2012	in % to GDP
Russia	19,075.83	1.12
Great Britain	38,707.5	1.77
Germany	76,796.9	2.64
Israel	9,921.0	4.86
China	12,1426.5	1.54
Korea	45,293.6	3.37
USA	398,194.0	2.77
France	42,892.8	2.02
Sweden	12,781.2	3.75
Japan	149,212.9	3.42

In our opinion, this data shows that there is no balance of innovative and investment spheres of macro-level yet. Let us view the dynamics of internal expenses for research and development as to sources of financing in the Russian Federation (Table 4).

Table 4. Internal expenses for research and development as to sources of financing, RUB million

All expenses	2008	2009	2010	2011	2012
including as to sources of financing:	371,080.3	431,073.2	485,834.3	523,377.2	610,426.7
budget funds	228,449.2	272,098.8	315,928.7	360,334.2	400,235.7
own funds of scientific organizations	30,555.8	35,855.1	35,312.3	47,407.6	73,293.5
non-budget funds	6,649.6	6,343.7	7,952.7	10,140.0	8,808.5
funds of organizations of entrepreneur sector	77,491.6	89,959.7	94,529.9	85,863.3	99,408.1
funds of educational establishments of higher professional education	890.0	518.1	327.2	508.2	1,568.8
funds of private non-commercial organizations	248.3	674.9	377.3	556.5	966.5
funds of foreign sources	26,795.8	25,622.8	31,406.1	18,567.5	26,145.5

The data in the table shows that the state in the main player that understands the importance of innovative sphere. Let us explain it with the help of the data in Table 5.

Table 5. Internal expenses for research and development as to spheres of activities, RUB million

Year	Total expenses	Spheres of activities			
		state	entrepreneurial	higher professional education	non-commercial organizations
2008	371,080.3	107,984.9	238,386.2	23,471.9	1,237.3
2009	431,073.2	129,871.2	271,206.3	28,868.6	1,127.1
2010	485,834.3	147,023.2	303,051.1	34,642.2	1,117.8
2011	523,377.2	161,988.4	316,701.7	43,714.0	973.1
2012	610,426.7	182,135.3	372,088.9	55,134.9	1,067.6

Table 6. Internal expenses for research and development for top-priority directions of development of science, technologies, and technics as to sources of financing in 2012, RUB million

Internal expenses for research and development for top-priority directions of science, technologies, and technics	Total	including the ones financed by funds of	
		budgets of all levels	including federal budget
	361,603.7	209,680.1	204,909.3
including:			
industry of nanosystems	23,451.7	16,233.5	15,952.3
informational and telecommunicational systems	46,609.9	29,260.4	28,242.3
life sciences	19,918.8	16,686.4	15,889.6
rational natural resources use	29,033.5	15,953.3	15,249.5
transport and space systems	148,970.1	84,294.1	83,327.4
energy efficiency, energy saving, nuclear energy	37,318.8	14,929.1	14,720.9

Table 6 shows internal expenses for research and development as to top-priority directions of development of science, technologies, and technics according to sources of financing in 2012 in the Russian Federation.

The main source of financing of research and development as to top-priority directions are means of federal budget (62.4%). They constitute more than 80% for the direction "Live systems". Only the research in the sphere of energy is performed by 52% by means of non-budget funds. The funds of the budgets of the subjects of the Russian Federation and local budgets provide only 1% of expenses for R&D in top-priority directions, including 4% - in the sphere of rational natural resources use and 3% - in the sphere of live systems. Thus, budget funds of federal level are the main source for practical realization of the formed priorities.

Thus, there is no balance of investment and innovative activities in the Russian economy yet.

At modern stage of the development of economy, the tasks of planning of well-balanced development of innovative and investment activities of economic systems acquire greater importance. The necessity for provision of well-balanced development of innovative and investment activity is confirmed by the unsatisfying state of activities of many economic systems at macro-, meso-, and micro-levels. It is the balance of these two leading giants – as to the scale of influence on the development of the country's economy – that will allow changing the existing stagnant situation and giving a huge impulse to appearance of a completely new type of functioning of economic systems.

Planning of well-balanced development of economic systems of all levels (macro-, meso-, micro-) supposes the positive changes through coordination and interdependence of elements, factors, and actions, external and internal support and may be represented as a socio-economic process, facilitating the increase of innovational potential of economic system, the basis for which is formation of harmonic innovational and investment sphere.

The determinants which determine this process are the following:

– Existing forms and the character of planning between the subjects of innovative and investment spheres of macro-, meso-, and micro-levels (legal and practical norms of relations, readiness of the state, investors, and innovational business for mutual compromises);

– State of innovative activities of economic systems of macro-, meso-, and micro-levels (volume of economic resources, distributed between scientific, technical, and educational spheres of activities, which business can use for its development), determining the peculiarities of economic interests of economic subjects, specifics and level of development of economic systems, and ratio of technological structures of economic system;

– Existing forms of investment activities for their implementation in innovative development by means of expansion of possibilities in perspective directions of scientific and technical, economic, and social development;

– The system of balance, created by external institutional environment, which forms favorable conditions for development and implementation of new technologies and increase of entrepreneurial activity through the tools of planning. This system of determinants is characterized by clear goals and tasks of development of all economic systems for the specific period of time, which is caused by: usage of all factors (external and internal), guaranteeing favorable conditions for effective functioning and development of economic system; existing unification of innovational processes in national economy; implementation of program-oriented approach to organization of innovative and investment activities; needs of economy in the quick diffusion of innovations within a certain specialization of economic system; necessity for integration of efforts of all subjects of innovative and investment activity; growth of need for shifting the emphasis in the management to the well-balanced development. Thus, the defined determinants of planning of well-balanced development of innovative and investment activity of economic systems determine the peculiarities of formation of harmonized measures which define the algorithm of achievement of set goals, in view of possibilities for the most effective use of investment resources and requirements of scientific and technical progress.

4. Discussion

The planning of well-balanced development supposes, primarily, the requirements of structural and qualitative improvement of economy – not just the qualitative one. Among the factors which cause the aggravation of the problem of the balance of the economy, are the accumulated disproportion of intersectoral and intrasectoral nature; aggravation of the problems of economic systems during the planning of well-balanced development of innovative and investment activity, which consists in the necessity for quicker reaction to various shifts, caused by science and technical revolution, change of situation in the global markets, increase of selectiveness of demand for consumer goods, etc. The importance of acquiring the methods of preserving the balance of innovative and investment activities under rapidly changing conditions of economy at macro-, meso-, and micro-levels is especially clear (Serebryakova, Sibirskaya, Stroeva, & Lyapina, 2014).

Planning of well-balanced development of innovative and investment activities will allow overcoming (in a simpler way) the existing problem factors, in particular: instability; lack and limitation of means and resources; constant growth of costs; competitiveness; ecological, social, and consumer problems; low level of quality.

Without analyzing and taking into account these problem factors during planning the well-balanced development of innovative and investment activity, there will be negative results, i.e., reduction of income of all members; increase of approximate cost of the project and of its terms; appearance of ков исполнения; fine sanctions for non-fulfillment of obligations; significant lag as to issue of innovational production to the consumer market and, consequently, the production being not innovational; inefficiency of decisions; lot percentage of efficiency of investment activity and increase of terms of projects' pay-off.

Thus, development of modern economy should be viewed as a constant process of creation of conditions for balance of all its components. Therefore, there is a necessity for systematization of measures as to change of dynamics through balance, which is caused not only by certain processes but due to the necessity for perfection – this requires deep changes which suppose the recovery of balance on a new, more progressive basis. The task of planning of the balance of innovative and investment activities entered upon the order of the day die to increased lack of resources (innovations and investments) and it stimulates the development of practical recommendations as to improving the mechanism of accommodation of interests of investors and economic systems, which perform the innovative activities, and as to formation of the balance of investments for the purpose of increase of efficiency of innovative activities. For the state and development of innovations and investments in Russia is the result of imbalance, and not an independent economic phenomenon. The realization of this fact is very important for choosing paths, methods, and conditions, for planning of the well-balanced development of innovational and investment spheres (Sibirskaya, Stroeva, Gubareva, & Mikheykina, 2014).

Among many variants of solutions to general problems, a special attention should be paid to recommendations as to formation of the balance of investments for the purpose of increase of efficiency of innovative activities.

5. Conclusions

Recommendations for the formation of the balance of investments for the purpose of increase of efficiency of innovative activities delimit the processes into components: analytical, synthetic, and practical.

Analytical processes of the balance are the complex of directions of activities aimed at the selection of possible variants of investing of innovative activities:

– State support for innovational projects which are implemented by economic systems (macro-, meso-, and micro-levels);

– Targeted investments by means of budgets of all levels through the system of crediting;

– State control for spending budget funds allocated for creation of innovational production;

– Use of various forms of innovative activities (according to the Russian classifier of type of economic activity);

– Creation of technological platform for informational exchange of investors and innovators;

– Provision of co-investing and commercialization of innovational products;

– Formation of investment lift and carry financing.

Synthetic processes of the balance are the list of necessary services, aimed at the determination of rational method of investing innovations:

– Consulting services as to terms of investing of various financial institutions;

– Creation of multi-level system of managerial consulting according to "innovations-investments" elements, types of connections between them, and phases of life cycle in view of peculiarities of making investment decisions of strategic character;

– Preparation of necessary set of documents for the positive contraction of investment bid;

– Presenting clients' interests in financial institutions;

– Consultations as to the time and optimal volumes of attraction of investments.

Practical processes of the balance consist in the implementation of offers aimed at the creation of innovations with active investment activities:

– Active investment policy ensures the innovative activities of economic systems;

– Creation of corresponding structure of investing innovations, providing the growth of financial pay-off;

– Formation of measures which reduce the risks of investing into innovative activities.

These recommendations can help implementing the well-balanced formation of the whole chain of creation of innovational product and development of effective infrastructure of economic systems investing.

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Transformation of National Innovative Systems: Russian and Foreign Experience

Olesya A. Stroeva[1], Nadezhda V. Mironenko[1], Pavel A. Merkulov[1] & Oksana V. Chubarets[1]

[1] Russian Presidential Academy of National Economy and Public Administration, Moscow, Russia

Correspondence: Olesya A. Stroeva, Russian Presidential Academy of National Economy and Public Administration, Moscow, Russia. Tel: 79-10-300-0119. E-mail: stroeva-olesya@mail.ru

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Abstract

The article analyzes existing national innovative systems and their characteristics. The authors allocate the preconditions for the formation of innovational system and determine the leading role of the state which consists in cooperation for production of fundamental knowledge and complex of technologies of strategic character, as well as in creation of infrastructure and favorable institutional conditions for innovational activity. The authors state that Russia requires long-term program for development of national innovative system, similar to the EU strategy "Horizon 2020", which, under the sanctions, can become a serious stimulus for the development of innovational business in Russia.

Comparative analysis of evolution of formation of innovational system of the USA, Japan, and the EU countries leads to the conclusion that Russia is at the initial stage of formation of institutional conditions of formation of national innovative system, but possesses a huge creative fundamental potential of ideas and knowledge.

Keywords: national innovative systems, model for innovative systems, innovational stimulation, "model of triple spiral", innovational entrepreneurship

1. Introduction

At present, national economic development of states is closely connected to such phenomenon as globalization: transnational corporations, global technological solutions, monetary development, and other pros and cons of the single global market and global economy became standard and contradictory phenomena of the everyday, to the favor or burden of our life. That's why the processes of globalization, with all their important meaning, develop in a very discrepant way. The inequality of development of particular countries and regions of the world increases, and there are attempts to impose the influence of certain countries on the development of the whole global potential. As a consequence, economic doctrine becomes a political and ideological norm for certain countries' prevailing over the whole continents. In its turn, this provokes various countries to self-determination and search for new paths of development, based on knowledge and intellectual & technological and technical dominant.

Certainly, search for own solutions to formation of economy is performed within coordination of development of national economy with tendencies of global economy. The scale of such coordination and models of own development which are born in the process of study of the most economically profitable forms of usage of leading developments are the result of direct influence of the processes of globalization and integration, demonstrating the influence on social and economic changes, formation of regional clusters, and directly in the development of innovational sphere of the countries.

Surely, at present, scientific and technical progress has a key role in the economic development of the state; it allows companies, various economy spheres, and national economies on the whole to increase their competitiveness.

It should be noted that by the middle of 2010s, the system of support for innovative activities in the Russian Federation is characterized by underdevelopment and inefficiency. Such countries as the USA and Japan, due to well-known reasons, occupy the leading positions in the world as to innovations and their commercialization, which produces increased interest to the experience of support for innovational entrepreneurship in these countries.

The main provisions, which lie at the basis of innovational policy, were formulated by the Western scientists. It was them who, in the middle of the XX century, began research in the sphere of problematics of growth, technological changes, and their interconnection. The founders of the theory of formation of national innovative systems are English professor K. Freeman, Swedish scientist B.-A. Lundwal, and American professor R. Nelson. While analyzing innovative activities, each of these authors focused the attention on particular elements and their interconnection.

Surely, the preconditions for this research were the works of J. Shumpeter (theory of economic dynamics), F. Hayeck (concept of dispersed knowledge), D. North (institutional theory), R. Solow (role of scientific and technical progress in economic growth), P. Romer, and R. Lucas (new theory of growth).

The scientific literature also contains the notions of "economy of knowledge" and "new economy" which refer to innovations; they denote "growing interdependence between the markets of capital and new technologies", and "strengthening of social orientation of new technologies, global character of creation and use of knowledge, technologies, products, and services" (Dynkin & Ivanova, 2004).

"In order to determine innovational policy, the modern Russian economic school uses concepts of evolution of national innovative systems and their central link – large corporation (Dynkin & Ivanova, 2004).

Innovations are in the system of institutional, economic, technological, and organizational factors. The condition for introducing and using the innovations is the optimal combinations of these factors. Disproportions and one-sided development lead to reduction of productivity and aggravation of well-being and level of life. During the consideration of the issues of formation of innovational economy of the state, a lot of attention is paid to the notion of "conception of national innovative systems" (NIS).

2. Preconditions for Innovational Systems Formation

Science is an important factor of innovations. Together with social needs, it is a leading source of innovations. However, it should be noted that as of today, it is not closed and isolated by the limits of scientific establishments – quite on the contrary, it is a mechanism built-in in the system of economic processes which take place in national states, their spheres of economy, companies, etc. Thus, science is an important factor of national informational systems.

The NIS theory is based on the ideas of J. Schumpeter which are devoted to competition, "built on the basis of innovation in corporations as a main factor of economic dynamics" (Schumpeter, 2007). Modern innovational system if formed under the influence of many factors for every country: volumes and availability of resources and peculiarities of institutes' development. All these factors are long-term determinants of direction and speed of development of innovational activity. For each state, its own national configuration of institutional elements is formed. The simplest NIS model supposes that private sector conducts research, receives technologies, and commercializes innovations. The state participates in creation of fundamental knowledge and complex of technologies of strategic meaning, and also forms the environment for activity of private companies. This very model forms the national peculiarities of NIS. On the whole, they are manifested in the correlation of the influence of the state and private sector in performance of these functions, large and small business, fundamental research, and R&D.

The conception of national innovative systems gives knowledge a special role in economic development. Also, it views the "analysis of institutional context of innovative activity as a factor influencing directly its content and structure" (Ivanova, 2002).

National innovative system is a variety of interconnected organizations (structures), dealing with production and commercial realization of scientific knowledge and technologies within national borders: small and large companies, universities, state laboratories, technological parks, and incubators. Another part of NIS is a complex of institutes of legal, financial, and social character which ensure innovational processes and possess firm national roots, traditions, and political & cultural peculiarities" (Dynkin & Ivanova, 2004).

Coming back to the notion of innovations, it should be noted that at present they are usually divided within several typologies. Firstly, they can be innovations-products and innovations-processes. Secondly, innovations are technological and organizational. Sometimes, it is possible to meet a mention of institutional, social, and other innovations. Besides, they can refer to material and non-material production (Stroeva, Sibirskaya, Khokhlova, & Oveshnikova, 2014).

Viewing innovations in the technical & economic sphere, they may be defined as radical (essential, revolutionary), evolutionary (gradual, modernization), and continuous or uneven (faltering).

Recently, the stated criteria were supplemented by new approaches. In particular, M. Porter and G. Bond divided innovations into ascending and descending (Porter & Bond, 1999). Ascending innovations are built on scientific research, and descending – on the process of commercialization.

There is still discussion as to the source of innovations within economic theory. Thus, they are subdivided into "technological push" (J. Schumpeter, K. Freeman, N. Rosenberg et al.) and "demand challenge" (J. Schmuckler, G. Mensch et al.). On the basis of this, innovations are divided into "offer innovations" and "demand innovations". Thus, it is possible to state that innovations are novelties which are formed in close interconnection with scientific & technical progress and R&D and provide qualitative increase of production process and its final result. Innovational entrepreneurship has become a special type of entrepreneurial activities. In order to understand better its meaning, it is necessary to define its components.

Thus, innovation means the process of creating initial idea with its further commercialization and receiving new products, technologies, or conducting cardinal improvements of existing products, services, or technologies. At that, it is necessary to create a prototype or a model which will allow using the new idea in practice. "A final stage of innovation is industrial manufacture of production which is demanded by the market and receiving the expected profit from selling this production (or from selling the license for corresponding patent)" (Bediy & Kolesnikov, 2011). This stage is called commercialization. Therefore, innovation is a process which includes several stages: from the idea of implementation of product, service, or technology to their commercialization.

The notion of "entrepreneurship" has several definitions which are presented in modern scientific literature. "Thus, in the publications of economic nature (R. Catillon, J. B. Say, A. Marshall), entrepreneurship is defined as the most important economic function which is characterized by risk, search, and implementation of novelties, and by combination of production factors. In other works (F. Hayek, Campbell R. McConnell, Stanley L. Brew, P. Samuelson, P. Drucker), entrepreneurship is defined as understood as psychology of behavior and management, supposing independent decision-making, organizational innovation, creative search, etc." (Popkov & Evstafieva, 2007).

Analysis of the existing national innovative systems allows structuring the following types of NIS models (Figure 1).

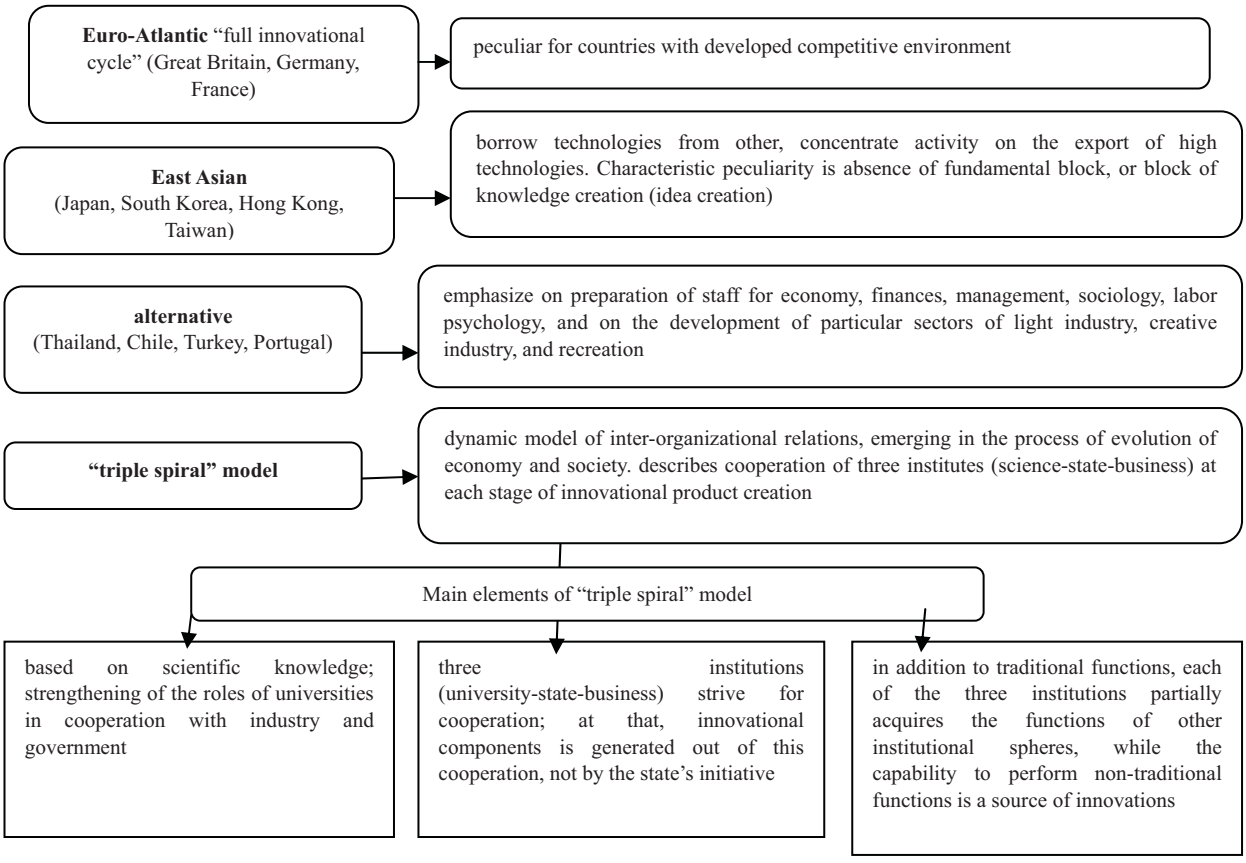

Figure 1. Models of national innovative systems and their characteristics

A special attention should be paid to the "triple spiral" model, which is peculiar for the USA, while its particular elements – for some developed countries of Western Europe, Brazil, and Japan.

The simplest model of cooperation of NIS elements is brought down to the fact that the role of private sector consists in the development of technologies on the basis of their own research and market acquisition of innovations. The role of the state is to facilitate the production of fundamental knowledge and complex of technologies of strategic nature, as well as creation of infrastructure and favorable institutional conditions for innovational activity. That's why it should be noted that F. Fukuyama in his work "Trust" (Fukuyama, 1995) calls local systems the "radius of spontaneous cooperation".

Interesting enough, M. Porter in his work "Clusters in new economy" (Porter, 1998) concentrates on the local level of knowledge, trust, relations, and culture, as a basis for rivalry, which causes: better access to employees and suppliers; access to specialized information; complementarity of various kinds; coordination with local companies; accessibility of social benefits (pool of skills, reputation, and technologies); better motivation.

It is pretty clear, that further development and prosperity of economy depends directly on innovations which increase the labor efficiency and productivity of invested capital.

Everything happening in Russia is aimed at stable development of the country through creation of innovational system, which includes orienting applied and fundamental science at modernization of domestic industry and creating new productions and technologies. Against the background of the globalization of the world economy, our country faces several problems (Sibirskaya, Stroeva, Khokhlova, & Oveshnikova, 2014):

– resource-based economy;

– joining WTO and significant imbalance of integration with the global economy;

– lagging behind in the development of infrastructure and general underdevelopment of industrial enterprises;

– low level of ties between scientific and industrial sector;

– complex mechanisms of financing scientific & research and R&D works.

This process (achieving stable development of the country) is many-sided and supposes participation of four groups of members. Firstly, it's producers of new knowledge – organizations working in fundamental research, such as scientific laboratories, research centers, etc. Secondly, entrepreneurial sector, responsible for production and commercialization of the results of applied and fundamental research. Together with these two groups, there is also a sector of education. i.e., higher educational establishments which form new knowledge with research organizations, and are also suppliers of staff for research centers and enterprises. The fourth member is the state.

Cooperation of these groups takes place in certain environment, i.e., innovational environment, which produces transformation of national innovative systems.

It should be noted that innovational environment is a complex of components which are supported by a system of measures of organizational, methodological, and economic character, which ensure creation of innovations (Sibirskaya, Stroeva, Gubareva, & Mikheykina, 2014).

The basis of innovational environment is formal rules, i.e., "game rules", listed in regulatory legal acts. Thus, Item 1 Article 2 of the Civil Code of the RF contains the definition of the notion "entrepreneurial activity is independent activity by a person conducted at its own risk pursuing as a basic purpose the extraction of profit from the use of property, sale of goods, doing work, or rendering of service, by registered persons in accordance with the procedure established by law" (Civil Code of the RF, 1994).

2. New Technologies and Crisis-Factor of Entrepreneurial Activity

Having viewed and determined the notion of "innovation" and "entrepreneurship", it is possible to pass directly to the definition of the notion "innovational entrepreneurship".

Thus, according to D. P. Ermilov, "innovational entrepreneurship is entrepreneurial activity which uses or concentrates on a certain stage (or several stages) of the production of innovation" (Ermilov, 2007).

This definition does not fully reflect the main meaning of innovational entrepreneurship, so, within this work, we shall understand innovational entrepreneurship as the "process of creation and commercial usage of technical and technological innovations" (Rudakova & Shaporova, 2011).

The last definition renders the meaning of innovational entrepreneurship better, as, apart from creation of new product or technology, it also supposes entrepreneurial income which is acquired due to the created product or technology.

In the broadest sense, innovational entrepreneurship is the segment of economy which deals with satisfying the changing social needs and forming completely new objects of demand. At that, the defining and obligatory feature of entrepreneur who develops new technologies and implements new combinations of production factors is not the status of owner. His main function consists in innovational activity.

It should be also noted that, as E. A. Yaroslavskaya and B. A. Yakubov state, "innovational entrepreneurship is a many-sided type of economic activity, the subjects of which are individuals and legal entities which can perform the following types of initiative activity, related to reproductive cycle of innovational product" (Yaroslavskaya & Yakubov, 2012): creating innovational product (direct innovational entrepreneurship); performing intermediary functions (providing services which relate to promotion of innovational products and its transfer from manufacturer to consumer); performing functions in financial sphere for the purpose of provision of innovative activities.

On the whole, innovative entrepreneurial activities are based on transformation of ideas (mainly, results of R&D) into new or modernized products, for the purpose of their implementation into the market or new (modernized) technologies or means for provision of services, for the purpose of their use in practice.

It should be noted that while conducting innovative activities, a necessary condition for acquiring innovation is using the variety of scientific, organizational, technological, and financial measures. Let us emphasize that scientific research and developments are not only the source of new ideas, but, at various stages of innovational process, can be the means of solving the problems which emerge at any stage of the cycle "research-production" (Bugayan & Kaymachnikova, 2010). Of course, transformation of national innovative systems is largely determined by the vector of entrepreneurial forms, by mental and creative potential. At that, we shall agree with O. A. Golikova's opinion that "the very meaning of entrepreneurship is most fully manifested in innovations, where a completely new combination of production factors is created (new production function)" (Golikova, 2011).

At present, after the 2009 crisis and 2014 sanctions, the situation of formation of national innovative system of Russia is not favorable at all.

Over the recent years, owners of small and micro-business were one of the most active clients of most of the Russian banks. The technologies of mass crediting ("credit factories") and special products were created specifically for small and medium business. As the technology of "crediting factory" developed, large banks were able to stabilize and successfully manage the higher level of past due debt which is peculiar for such products. However, slowing of economic growth, foreign policy instability, and fluctuations of currency exchange performed a substantial blow to paying capacity of small and medium business (SMB). Those were unsecured loans that began to fall in arrears. As of 01.01.2015, the level of past due debt in the segment of SMB reached 8.3%, which is 1.1 percentage points higher than for 01.01.2014. At that, the share of past due debts of SMB in banks from top-30 increased up to 10% - against 9% as of 01.01.2014. For this same period, the past due debt in financing retail customers grew by 1 percentage point and reached 6.2%, while in financing the large business the past due rate constituted 3.8%.

Crisis phenomena in economic in 2014 dealt substantial damage to small business, among other things from reduced access to financing. Thus, the cost of credits for entrepreneurs increased. While in September 2014, the average interest rate was 17-19%, in December 2014 it increased to 25-35%.

During 2014, the share of loans, given for the period of more than three years dropped from 15 to 11%, while the share of loans given for the period of up to 1 year grew from 20 to 21%.

Negative dynamics of the portfolio in SMB segment in 2014 is caused by two key factors. On the one hand, aggravation of financial state and reduction of repayment discipline of SMB subjects, due to which the banks tightened the requirements to their borrowers during 2014. On the other hand, re-orientation of leading members of the market to financing large Russian companies which lost access to large Western markets of capital due to sanctions.

That's why the loan portfolio of SMB in banks from top-30 reduced by 8% as to the assets in 2014, while other members of the market had a growth by 9%.

The top-3 of the market remained the same (Figure 2). VTB 24 bank, unlike its neighbors in top-3, showed positive rates of growth, increasing the portfolio by 6.3%, as compared to 01.01.2014. In the aggregate, the share of top-20 banks which finance SMB grew by 2 percentage points up to 44% (42% at the year-end of 2013) (Financing SMB: melting growth, 2014).

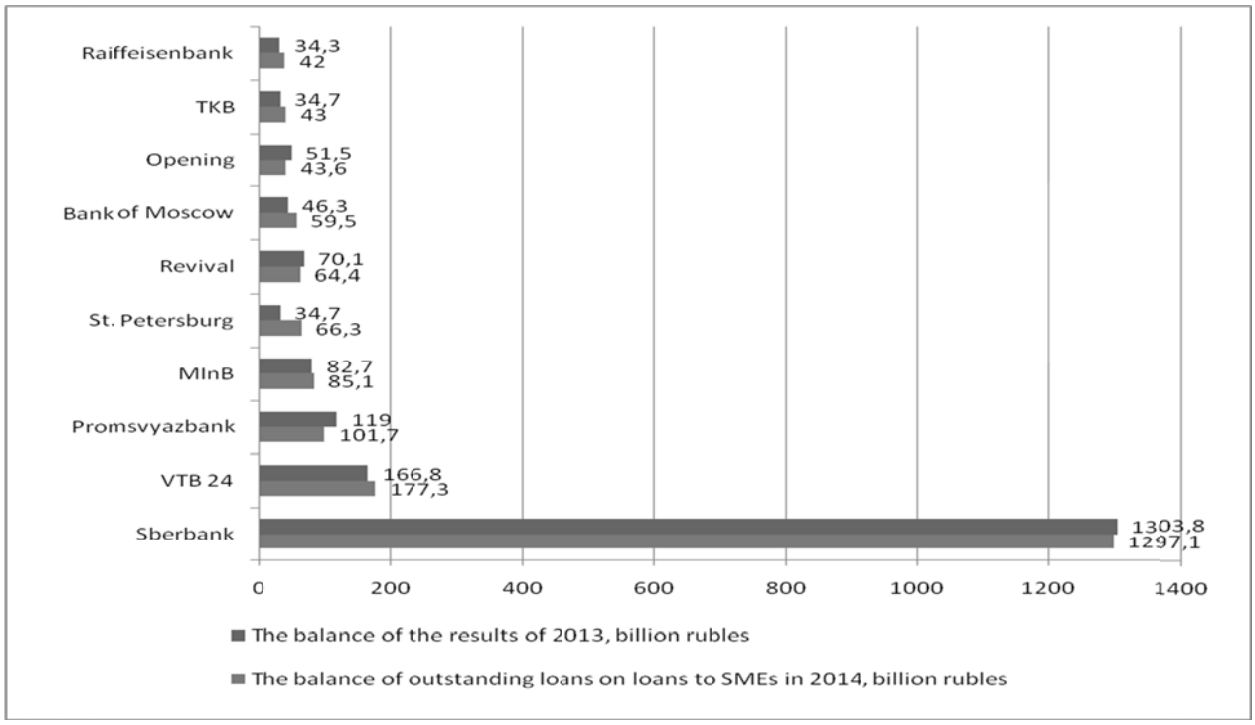

Figure 2. Top10 banks as to the volume of the loan portfolio for small and medium business (Financing small business…, 2014)

At present, there is a huge work for complex support and stimulation of activities of SMB at the state level. In July 2014, the Agency for Loan Guarantees began working; it is supposed to lead the creation of the national guarantee system. The guarantee provisional mechanism, offered by the Agency, will allow increasing the accessibility of credit resources for SMB, especially in view of significant liberalization of criteria for selecting projects and clients, including removing constraints as to 209-FZ (as to the structure of property and quantity). Implementation of these products into the line-up of the Agency will allow expanding the access to credit resources for enterprises of small and medium business and can be a serious stimulus for the development of SMB. However, the vivid effect from creation of the Agency for SMB can be observed not sooner than the end of 2015.

An additional driver for financing small and medium enterprises is the growth of import-substituting productions against the background of the Russian Government's using "food" sanctions for a range of Western countries, which can give a new push to the development of business in Russia. However, this effect will be observed not sooner than 2016, and only under the condition of successful implementation of state programs for the development of domestic production.

3. Regional Innovational and Economic Priorities

Innovational course of development of Russia is conducted with a direct participation of the state, business society, and scientific staff. Some regions of the Russian Federation already have an experience of integration into the world economy with the use of the most efficient methods of economic solvation. This path will stipulate Russia's taking the leading positions in the global economy, i.e., innovation and competitive economy.

At the modern stage of globalization, there is activization of national systems' participation in the global processes. Density of economic relations at the regional level grows. Under the conditions of the change of political structure of the world at transition from bipolar world to depolarization and multipolarity, the role of regional associations grows; these associations gravitate toward emerging "poles" or "centers of force" and influence the tendencies of the global economic development.

Modern economic situation is characterized with uncertainty of perspectives of the global economic growth against the background of the world economic activity center's transferring from West to East, from America and Europe – to Asia, from developed regions – to developing ones. Accordingly, the influence of large

developing economies and regional integration associations with them grows, which creates new preconditions for transformation of innovational systems.

The model of globalization, formed by developed countries according to the principles of neoliberalism, turned out to be unstable and insufficiently flexible for preserving the dynamics of development, under the conditions of the crisis. As a matter of fact, developed countries used all economic benefits from one-sided global integration, related to development of regional product markets and advantages of cheap production resources, which became one of the reasons for the global crisis. However, the large markets of the North America and Europe were formed, and they still play the main role in the processes of regionalization and selection of strategies for regional integration. According to the World Bank report "New view on economic geography" (Report on the global development, 2014), selection of effective strategy of regional integration is influenced by density of international economic connections and remoteness from main global markets.

It should be noted that large-scale acquisition of new technologies and growth of globalization led to reduction of the meaning of traditional productions in many spheres, while the potential attributes of small enterprises strengthened. Small and medium enterprises are numerous and constitute around 95% of all enterprises, providing 60-70% of employment and creating new jobs in the USA and the EU.

Despite the fact that small enterprises possess less - as compared to large enterprises – assets for research, they, however, "have greater innovational potential, for example, a possibility for quick creation and re-engineering of goods and services which can quickly respond to demands of new markets. Small enterprises quickly acquire new organizational models for reduction of costs and implement technologies for increasing the sales" (Mamontova, 2009).

Most of these enterprises refer to highly specialized spheres and are located in the spheres of active economic development. Very often, these leaders of economic development are formally and informally united unto network structures of connected enterprises (Mironenko, 2013).

Small innovational enterprises play a key role in the development of new production and new markets in the spheres of high-tech, including informatics, biotechnologies, medical and pharmaceutical industry, telecommunication and information processing, research and development, marketing research, and production and personnel management.

Active role of entrepreneurship is an important condition for development of small innovational enterprises. Position, qualification, and activity of entrepreneurs influence the economic development: creation and development, crisis and decline, breakdown of enterprises, and their full life cycle. It should be noted that the process of entrepreneurship still remains a kind of art. "In every country, social, cultural, and political factors influence the entrepreneurial possibilities and capability for risk. Among the factors which hinder entrepreneurship and creation of new innovational enterprises, it is possible to name low educational level, norms, and obstacle from state authorities" (Mamontova, 2009).

Thus, innovational environment is an outpost of formation of national innovative system; in 1990s, governments of the European countries began to put emphasis on solving problems of innovations. Various measures were taken for stimulation of innovational enterprises.

The state's attention is concentrated on supporting the "environment" which stimulates innovations and risk. There is a shift of focus of state support from specific companies to support for competition, improvement of the system of protection of intellectual property and creation of innovational clusters.

Informational component becomes an important part of state policy. With the globalization of economy, national innovative system turns to institutional factors. Due to the development of Internet technologies, the state faces new tasks: struggle with piracy, increasing the security of online trade operations, protection confidentiality, and solving the problems of national jurisdiction.

In the globalized world, the support for innovations leaves the national limits and becomes a prerogative of the European Union and supranational organizations which work on the "code of behavior" of the companies and states in the global markets of new technologies. The character of scientific and technical programs of the EU also changes: "technological" course changed to orientation at the creation of infrastructure of distribution of new informational technologies.

Due to wide use of informational technologies, there goes a unification of national patent systems with creation of multilevel mechanism of protection of intellectual property, when frame norms are developed at the supranational level and national departments perfect the patent protection.

Scientific and technical factor (R&D, cooperation in development of new technology, results of patent work) becomes one of the main landmarks of the market in the evaluation of cost of capital of a company.

As the experience of the countries of Northern Europe showed, favorable environment is a guarantee for active innovational activity of companies.

Another task of the EU is deepening the processes of economic integration and its expansion by means of new members from Eastern Europe. It was successfully realized, and the EU formed productive and economic potential, equal to the American one. Against this background, an interesting European paradox is shown: having good scientific base and possibilities for commercialization of the results of this activity, the EU was losing in the innovational race at the global scale.

4. Innovational Strategy of the EU

The EU implements various programs in innovational sphere. One of such programs is "Eureka", started in 1985 for the purpose of liquidation of growing technological gap between Western Europe and Japan & USA. It was supposed to solve to tasks: overcoming regional and sectorial division of scientific and innovational potentials; mobilization of entrepreneurial sectors, especially small and medium enterprises, for manufacture of high-tech production with state support.

At present, a special importance belongs to the following programs: Framework Program of the EU (in 2014, it was the eighth framework program "Horizon 2020"); the European scientific environment, etc.

Thus, in 2014, the Seventh Framework Program of the EU was replaced by a new program for scientific studies and innovations "Horizon 2020" (Framework program for scientific research and innovations "Horizon 2020", 2014).

The new program united the Framework program for scientific and technological development of the EU (FP7), Competiveness and Innovation Programme – CIP, and the European Institute of Innovation and Technology. In general, the implementation of the "Horizon 2020" program will cost around EUR 80 billion.

The program consists of three main priorities:

- Excellent Science – supports the best scientific ideas and provides the access to research infrastructure for scientists;

- Industrial Leadership – facilitating the attraction of investments into key industrial technologies, growth, and the European companies' entering the global markets; i.e., stipulating Europe's turning into the center for attracting investments into R&D.

- Societal Challenges – aimed at solving main societal problems: the program will unite resources and knowledge in various scientific spheres: healthcare, demographic changes, and well-being; safety of food products, agriculture, sea studies, and bioeconomics; clean, safe, and effective energy; ecologically safe transport.

Then, within the international cooperation, there is planned participation in Framework Programs with scientific organizations from the US and BRICS (Brazil, Russia, India, China, South Africa). Thus, as a result of implementation of the seventh framework program (for scientific and technological development of the EU (FP7), 452 scientific organizations participated in realization of 281 projects for an overall amount of EUR 54.9 million.

At present, innovations are given special priority by the Government of the RF both at regional and federal level, for the state attempts to create the Russia's image as "high-tech nation".

At present, for the purpose of support for innovational development, Russia created the following state institutions for support for innovational entrepreneurship.

In particular, Development Fund of the Center of development and commercialization of new technologies (Skolkovo Fund) provides the formation of the full cycle of innovational process. The Fund also finances scientific research, R&D works, organization of compact production, start and development of sales, and promotion of innovational product and technologies in the market. The volume of financing: the stage of idea – up to RUB 1.5 million; seed stage – up to RUB 30 million; early stage – up to RUB 150 million; advanced stage – up to RUB 300 million.

Then, the Fund for support for development of venture investments into small enterprises in the scientific and technical sphere of Moscow was created for the purpose of satisfying the needs of small innovational enterprises in financial resources and creation of favorable conditions for leading business activity in scientific and technical

spheres in Moscow. The main task of the Fund is to grant access for small innovational enterprises to the sources of non-budget financing (from RUB 10 million to 120 million) for implementation of venture projects.

Table 1. Period of reforming of legislation for support for innovative entrepreneurial activities in Russia

period	characteristics	Methods and measures of realization
1993-1994 (RF Government Decree dated February 3, 1994, No. 65)	Creation of the Fund for support for development of small enterprises in scientific and technical sphere in the type of state non-commercial organization	Accumulation of financial assets for support for small and medium business; the Fund receives 1.5 % of the assets of the federal budget for science.
1995-1996 Federal Law dated August 23, 1996 No. 127-FZ "Concerning science and state scientific and technical policy"	State support for innovative activities (introduced by the Federal Law dated June 21, 2011, No. 254-FZ), Article 16.1	The measures are aimed at modernization of the Russian economy, provision of competitiveness of domestic goods, works, and services in the internal and external markets. Priority use of market tools and tools of public-private partnership for stimulating the innovational activity; provision of efficiency of state support for the purpose of socio-economic development of the RF and the subjects of the RF; purposive character of using the budget assets
2007 (Federal Law No. 139)	Creation of state corporation "Russian Corporation of Nanotechnologies"	The Corporation invests into the projects related to nanotechnologies

It should be noted that the main part of institutions are located in agglomerations: the Fund for support for financing small business of Moscow was created by the Moscow Government; Moscow Fund for personnel training and support for development of innovative activities; Moscow Venture Company OJSC – institute for development of Moscow.

Thus, a "transitional" model of national innovative system is being formed in Russia.

The influence of the processes of globalization and integration on the development of national economy stipulates the formation of innovational environment as a basis for competitive advantage of macro-, meso-, and micro-levels of Russia's economy. Due to that, there is a necessity for study of the influence of processes of globalization and integration on the development of innovational environment.

5. NIS in the USA

It should be noted that in the USA, the main support in the sphere of innovative entrepreneurial activity is granted for small and medium enterprises, as they are one of the drivers of the scientific and technical progress. A significant role in that belongs to programs of federal ministries and departments which are oriented directly at supporting small and medium business. We do not seek the detailed analysis of formation of national innovative system of the USA, but we have made an attempt to structure the main stages of formation of national innovative system in the USA (Table 2).

As is seen from Table 2, national innovative system of the USA has been forming for more than 50 years, transforming in view of the factors of external and institutional environment.

Thus, the program Small Business Investment Company (SBIC) provides SMB with capital at the initial stage.

The program Business Information Center (BIC) supports the activity of 400 informational centers which provide services for support for small innovational enterprises as to the use of innovational methods of work with the help of new achievements in programming and communication devices.

The program Service Corps of Retired Executives (SCORE) (Table 2) provides free consultations as to almost all issues relating to starting new business. The program members include professional managers and businessmen, which stipulates the transfer of experience to the young generation from successful entrepreneurs, this increasing the efficiency of implementation of innovational programs and projects.

Table 2. Evolution of formation of national innovative system of the USA

period	Characteristics	Measures for implementation
1958	The Congress created the Small Business Investment Company (SBIC) program for easy movement of long-term capital of America's small business	SBA does not provide capital directly for business, but are partners with private investors of professionally managed investment funds (known as "SBICs") which finance small enterprises (SBA Loan Programs, 2014).
1964 – until now	Appearance of association SCORE which provides free consultations as to almost all issues relating to starting new business	Formation of the system for reducing transaction costs. In 1996, SCORE started providing consultations for small business with the help of e-mail (services used by more than 8.5 million clients); the organization expanded its range of services, offering business meetings and seminars in various business topics
1980	Bayh-Dole Act, the purpose of which was to increase the stimulus of scientific workers for commercialization of their inventions	Regulatory position which give universities the possibility to receive profit, implementing R&D into revenue item
1981 - 1990	Regulatory positions in the form of variety of federal programs for support of projects and creation of infrastructure in financing R&D	Creation of "Administration for small and medium business which successfully implements many programs" (Official USA portal, 2015).
1982	The Law "The Small Business Innovation Development Act" which was further supplemented by minor amendments, passed in 1982	Stimulating technological innovations; using small business for satisfying the needs of federal government in the sphere of R&D; providing access to technological innovations for least protected groups of society (disabled, minorities, etc.); intensifying the process of transfer to private sector and further commercialization of the developments made by state R&D laboratories (Andrianov, 2012).
1982 – extended until 2017	Government programs for innovations support are "The Small Business Innovation Research" (SBIR). The goal of the SBIR program is supporting scientific knowledge and technological innovations through investing the assets of federal budget in order to abide by the most important American priorities and to create a strong national economy	Created for strengthening the role of small innovational entrepreneurship in research and developments, financed by the state; covers 10 largest federal ministries and national agencies, including defense, education, energy, astronautic science, etc. By 2009, 112,500 grants for the total sum of more than USD 26.9 billion were given. It includes three stages: 1st – creation of technical advantages, technical & economic and commercial possibilities of the offered innovations (grants do not exceed USD 150,000 for 6 months); 2nd – development of commercial potential of the project (grants do not exceed USD 1 million for 2 years); 3rd – commercialization of innovations created during the first two stages (if necessary).
1992 – until now	STTR (Small business technologies transfer) (Department of the Army of the USA, 2015).	The goals of the program are stimulating technological innovations and possibility for transferring innovational technologies between small enterprises and scientific establishments.

It should be noted that besides the federal government, the assets for conducting research in the sphere of innovations are provided by particular American states and venture funds. The system of venture funds of the USA appeared in the 1950s and is a very popular source of financing – as it gives around USD 36 billion annually and "allows concentrating more than half of venture capital in the USA" (Small business: foreign experience, 2014).

"Over 1995-2001, the investments of the American venture capital – according to a famous audit company Pricewaterhouse Coopers – increased from USD 7.6 billion to USD 41.3 billion" (Tsikhan, 2011). Such volumes

of venture investments became the basis for decisive innovations and large transnational companies – Apple Computers, Microsoft, Intel, Google, etc.

Such active development of venture industry in the USA, according to experts, is largely caused by the fact that stock and national markets are at the high level of development in the USA.

There appeared a term of "business angel". "Business angel" includes state and private investors which are ready to invest into development of SMB at the period of early start.

The SBIR program is still active, with the following criteria: representatives of small business have to be American companies with the number of employees of no more than 500 and with commercial purposes" (Manina & Shevrov, 2012).

It should be also noted that federal departments with R&D budgets of more than USD 100 million, should give 2.5% annually for SBIR. Each department manages its own individual program, sets the topics of research, and receives applications from small business enterprises. The awards are granted on the basis of competition after the evaluation of the offers. At present, 11 federal agencies participate in the program, including Ministry for Defense, Department of Energy, Department of Education, and Department of Homeland Security. This is a very serious program for departments and a real resource for attracting innovations for the purpose of protection of national interests.

Interesting enough, in 1992 there appeared a program which stimulates the cooperation of SMB with non-profit research structures – The Small Business Technology Transfer Program (STTR). This program allows creating joint ventures on the basis of small business and non-commercial research institutes.

The important role of STTR consists in the fact that it liquidates the gap between achievements of fundamental science and results of commercialization of innovations.

A unique peculiarity of STTR program is the requirement to small business to officially cooperate with R&D establishment within stages I and II (Table 2).

The program also has three stages: 1st stage is granted USD 100,000 for 1 year, and the total fund for 2nd stage does not exceed 750,000 for 2 years. At present, five establishments participate in the program: Ministry of Defense, Department of Energy, Department of Health, NASA, and the National Scientific Fund. (Manina & Shevrov, 2012).

Apart from the stated programs for support for innovative entrepreneurial activity, there are also other programs in the USA.

"Another peculiarity of small business of the US is popularity of franchising. As far back as the middle of XIX century, such companies and Zinger and General Motors founded their franchise networks. At present, according to the International Franchising Association, there are more than 2,000 franchisors and around 600,000 receivers of franchise in the USA" (Dalakova, 2011).

Among high-tech business in the USA, the leading positions belong to nanotechnologies. "Their use in electronics (chips, semi-conductors), energetics (batteries, accumulator), chemistry, petrochemistry and oil processing, and for manufacture of medicine is enabled by scientific research on the basis of modern untrasensitive and extremely-precise equipment which provides high quality of analysis. The specifics of economy in the sphere of nanotechnologies is caused by the peculiarities of the very nanotechnological product – the rate of appearance, distribution, and replacement. Due to that, the life cycle of products market reduced to 7-9 years" (Avilova, 2010). That's why large enterprises, possessing wide and complex hierarchy of management, cannot take flexible managerial decisions – so, nanotechnologies become a prerogative of small and medium innovational business.

"As a result, more than 6,000 projects for the total sum of USD 2 billion are realized within the programs of support for small and medium innovational business annually" (Avilova & Bashkirtseva. 2011).

Summarizing, the mechanisms for support for innovative entrepreneurial activities in the USA consist of law initiative and dedicated programs. The goal of the programs is helping science-based enterprises in attraction of venture investments, the share of which in high-tech sphere grows annually.

6. NIS in Japan

The experience of creation of national innovative system of Japan is especially interesting, as of today.

The Japanese national innovative system is based on registration of rights for intellectual property. That's why the legal basis for provision of innovational development of Japan is "The main law concerning the intellectual

responsibility" (December 2002). The law is aimed at organizing the "cycle of intellectual creation" at the national scale. This cycle should include the three important components, united into the interconnected system: creation of innovation – receiving patent – commercialization of innovation. The last stage turns innovation into a real item of revenue, and then the assets will be invested into the first stage of the second cycle.

The law provides that the state is responsible for development of implementation of the policy which ensures the formation and reproduction of the cycle. At that, certain responsibility for its realization is put on regional authorities who are responsible for personnel training and supporting the technologies transfer. In their turn, universities are responsible – together with the state – for creation of favorable conditions for activity of researchers and engineers and the most effective use of their knowledge and experience.

The model of NIS for small entrepreneurship is aimed at implementation of the growth of competitiveness level among the developed countries. For this purpose, Japan, while forming innovational system, focuses not only on technical and technological factors but also on technologies in the sphere of organization and management.

It is possible to state that a special feature of the Japan's NIS is that it consistently forms and develops, beginning from the middle of XX century and having passed several stages. At that, at each stage, government bodies and entrepreneurial circles acted as a team, strengthening financial, HR, and material base of science, still focusing at constant renewal of equipment and perfection of productive and organizational technologies, and developing the system for quality control, this developing the staff's need for further training and active use of new knowledge.

In Japan, there is the Small and Medium Enterprise Agency (SMEA). This agency coordinates the work of all infrastructure of support and development of SME, cooperating with large state organizations, scientific centers, and research institutes.

An important role in support for innovational SME belongs to Organization for SME and Regional Innovation of Japan (SMRJ). This structure consists of 9 institutes which develop new methods for managing innovational enterprises, several technological parks, and business incubators. SMRJ agency created, with support from administration of municipal establishments and municipal chambers of commerce & industry, the network of regional organizations: "Venture centers for entrepreneurship support"; "Municipal centers for SME support", and "Regional centers for SME support". The staff of these centers includes local entrepreneurs and managers with large experience and professional knowledge. This regional network consists of 8 ventures, more than 50 regional, and more than 250 municipal centers for SME support.

In 10 largest cities of each prefecture, there are regional centers for entrepreneurship support. These centers are oriented at the needs of corresponding prefectures. While implementing the programs for SME support, these centers provide consultations for entrepreneurs and provide support in the spheres of finances, technologies, equipment, etc. These centers host seminars and programs for entrepreneurs training.

Municipal authorities also play a large role in supporting innovational SME. Thus, for example, during construction of technological park on the Kyushu Island, large long-term loans under low interest (from 1% to 8%) were granted for the purpose of stimulating foreign investors.

In Japan, there are more than 100 technological parks which are the center for cooperation of universities and industry. Most of technological parks were created in the regions with support from municipal authorities, and more than 50% of them are oriented at the manufacture of high-tech production.

The 1999 "Small and Medium Enterprise Basic Law" (Act No. 154 of 1963: Amended in December 3, 1999) allowed the further development of support for innovational SME. Thus, the budget financing of perspective R&D increased, and perspective R&D with large period of research received special financial support. The financing of R&D was increased by 50% due to government orders. The financing of support for commercialization of R&D was increased by 30%, while financing of the help for young researchers – for 20%. It is expected that over several years, the quantity of patents, issued to universities, will increase by 10 times due to the growth of budget financing of transfer of technologies into industry.

The Temporary Law concerning Measures for the Promotion of the Creative Business Activities of Small and Medium Enterprises provided support for starting SME which specialize in R&D and commercialization of innovations. The support consists in granting subsidies, preferential credits, and tax exemptions from local authorities.

"The Law concerning the Promotion of Creative Activities of SMEs and "The Law on Supporting Business Innovation of Small and Medium Enterprises" provided new mechanisms for support for innovational SME. These are Limited Partnerships for Venture Capital Investment which generate into local venture SME. It should

be noted that such partnership must include the SMRJ agency which is one of the investors. The system for tax remissions for purchase of equipment, manufacture of prototype, and attraction of specialists is an important mechanism for support for venture and innovational enterprises.

Administration of municipal establishments develops the programs for development and creation of local production centers which unite the activities of specialized SME.

7. Conclusion

Having studied the experience of formation of national innovative systems, it is possible to state some features which are peculiar for innovational enterprises of small and medium business of all national innovative systems.

It is worth noting than financing of small enterprises has a range of serious problems. Firstly, it should be emphasized that, in comparison with large enterprises, small innovational enterprises are characterized by instability of volumes of profit and short life cycles. Managerial staff of small enterprises often does not have commercial experience and/or entrepreneurial past. Thus, both in production and marketing, first stages of development are characterized with uncertainty. Small innovational enterprises work in very complicated conditions which change quickly. Besides, small innovational enterprises often face difficulties in obtaining loans, as banks and traditional credit organizations are not inclined to finance risky projects of enterprises.

Transformation of national innovative systems is largely caused by such factors as innovational environment and efficiency of institutional systems (formality of norms and rules).

Probably, Russia needs creation of separate zone which would become an analogue of Silicon Valley, producing the transfer from the "triple spiral" model, taking into account transformations of national innovative systems and forming the core of especially active innovational small enterprises with a high level of growth which will constitute 5-10% of other developing small and medium enterprises.

As innovational technologies and business models stipulate the organizations' taking their multiple operations as separately functioning elements, they have a possibility to combine them. They can combine and disconnect them, according to the strategic evaluation of the fact, what actions would allow independent achievement of necessary results and which organization would trust its business partners.

Nowadays, as a rule, national innovative systems are transformed under the influence of the global open economy with a high level of competition and growing speed of generating innovations and their propaganda.

As a result, we observe the growth of intensity of interaction between countries, organizations, and societies in all spheres of life, which demonstrates the influence of the processes of globalization and integration on the development of national innovative systems.

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Conceptual Foundations of Management of Infrastructure of Support for Small Entrepreneurship

Lyudmila G. Rudenko[1], Natalia A. Zaytseva[2], Elena A. Dzhandzhugazova[2], Maria V. Petrovskaya[3] & Vera N. Larionchikova[3]

[1] S.Y. Witte Moscow University, Moscow, Russia

[2] Plekhanov Russian University of Economics, Moscow, Russia

[3] Russian University of Friendship of Peoples, Moscow, Russia

Correspondence: Lyudmila G. Rudenko, S.Y. Witte Moscow University, 12, 2nd Kozhukhovskiy St., Moscow, Russia. Tel: 7-916-792-9975. E-mail: mila.k07@mail.ru

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Abstract

The article views the issues of development of conceptual frameworks of management of infrastructure of small entrepreneurship. As a result of the conducted research, the subject and object of management, as well as the forms of management functions of managerial influence are clarified; the proprietary vision of the principles of management of infrastructure of support for small entrepreneurship is given. The article also describes approaches to description of measures for support for small and medium enterprises, evaluation of effectiveness of realization of the concept, and direction of its further development. Special attention is paid to perfecting the legal base, regulating cash operations by subjects of SME, provision of access by subjects of SME to state and municipal purchases and investment resources for subjects of SME, and development of the system of micro-financing. The authors substantiate that it is necessary to distinguish two notions: "forms of management" and "methods of management". Methods of management are viewed in the article as an important legal means which is a totality of means and methods used by state authorities and their official bodies within limits, set by the law, in order to perform management and administrative influence as to certain persons and objects. At that, form of management is certain external manifestation of managerial actions (management), performed by state authorities (of federal and regional level) and by local authorities. The authors substantiate that general functions of managing socio-economic systems have remained unchanged over several recent years. However, the number and content of functions of the system of management of infrastructure of support for small entrepreneurship will differ a little, as, according to its content, it is referred to the level of socio-economic management.

Keywords: small business, infrastructure support, conceptual foundations of management, management principles, forms and methods of management, functions of management, effectiveness of management

1. Introduction

Development of small entrepreneurship should be viewed in aggregate and in the system with development of infrastructural support for small entrepreneurship. Systemacity of such progressive development supposes certain entity with features that are not peculiar for its separate elements. Only in aggregate, the mechanism of management of this system can reach its maximal effectiveness. The form of manifestation of this system could be the development of conceptual foundations of management of infrastructural support for small entrepreneurship.

Methodological basis for this research are works of the Russian economists and practitioners in the sphere of formation of entrepreneurial activities, development of small entrepreneurship, and infrastructure: Blinov A. O., Zhiltsov E. N., Busygin A. V., Erokhina L. I., Egorov E. N., Kazakov V. N., Kachurina M. M., Kruglova N. Y., Magomedov S. M., Morozov V. Y., Osipov Y. M., Platonova N. A., Sulpovar L. B. and others, as well as works of foreign scientists and specialists: P. Drucker, M. Weber, I. Schumpeter, V. Zombft, and others (Miller & Bromiley, 2001; Nonano et al., 2005; Fayol, 1992).

In our opinion, modern literature pays not enough attention to conceptual foundations of management of infrastructure of support for small enterprises, which lead to creation of this article.

Infrastructural support for small entrepreneurship is dynamically developing with state's support. In his message to the Federal Assembly dated December 4, 2014, the President of Russia emphasized the necessity for support for small and medium enterprises through creation of industrial parks in subjects of the RF (beginning from 2015, there starts a program of compensation for expenses of the subjects of the Federation for creation of industrial parks), expansion of access of SME to purchases of state companies, and determination of annual volume of purchases, elimination of discrimination of private sector in social sphere, and provision of equal access for private sector for financial resources. Also, the President spoke of the necessity for elimination of excessive control, "to refuse from the very principle of total and endless control" if "enterprise has acquired reliable reputation and haven't had any complaints during 3 years, there should be no planned examinations within state and municipal control over the following 3 years", and of fixing existing tax conditions over the following 4 years and not changing their control holidays. The President pointed out the necessity for business conversation with entrepreneurs: "It is important that representatives of business, researchers, and developers tell which barriers to take away and what support they need".

The forecast of socio-economic development of the Russian Federation for 2014 and for planned period of 2015 and 2016, the Ministry for Economic Development offered measures for support for small and medium entrepreneurship (Forecast of socio-economic development of the Russian Federation for 2014):

- Improvement of legal regulation in the sphere of accounting by subjects of SME;
- Improvement of legal system for alienation of state and municipal property, purchased by subjects of SME and the simplification of access for small enterprises as to purchase and rent of property. For this purpose, there is active popularization and development of Internet-portal www.torgi.gov.ru, aimed for posting information about auction as to state and municipal property and limited resources;
- In the sphere of statistics: improvement of methodology of selected statistical observations for activity of the SME subjects;
- Improvement of labor law which regulates relations in the SME sector;
- Improvement of regulatory law base of the Central Bank of Russia which regulates the implementation of cash operations by SME subjects;
- Provision of access for SME subjects to state and municipal purchases and infrastructural monopolies' purchases;
- Improving the access to financial and investment resources for SME subjects and development of micro-financing system;
- Development of mechanisms and principles of outsourcing the works (services) of companies with state share, which confirmed the programs of innovational development;
- Further improvement of special tax regimes for SME.

A huge attention in new forecast of socio-economic development of the RF is paid to development of competition. In the fulfillment of the order of the Government of the Russian Federation, dated June 14, 2012, there was developed the road map "Development of competition and improvement of antimonopoly policy" which includes systemic measures for development of competition in top-priority spheres for 2013-2015.

2. Modern Approaches to Description of Functions of the System of Management of Infrastructure of Support for Small Entrepreneurship

While creating the model of conception of management of infrastructure of support for small entrepreneurship, it is necessary to realize that there are certain differences in management in commercial organization and management at macro-level. Management at the level of the state has its peculiarity which is manifested in powerful regulating influence on the object of management (society, citizens, organization). Y. N. Starilov defines the meaning of state management as regulatory, target-oriented, organizing, executive, and regulating activities of the system of state executive power bodies which perform the functions of state management in the basis and in compliance with laws in various spheres of economic, administrative and political, and socio-cultural activities and spheres (Rossinskiy & Starilov, 2009).

The process of management is impossible without management system which can be viewed as a certain mechanism, triggered into action by certain tolls of influence for the purpose of receiving result. System of management should have the determined informational ties between its elements and it should have the existing feedback – otherwise, such a system would be unsustainable without feedback. Feedback allows controlling the process of management and determining the effectiveness of management influence.

In his work "General and industrial management", H. Fayol characterized the process of management in the following way: "To manage is to foresee, organize, dispose, coordinate, and control" (Fayol, 1992).

Thus, he determined five main functions of management. The number and content of functions of the system of management of infrastructure of support for small entrepreneurship will somewhat differ, as, according to its content, it is referred to the level of socio-economic management. General functions of management of socio-economic systems remain stable over the recent few years (Makareyko, 2009). Let's view their list with certain changes, necessary for application in the model of conception of management of infrastructure of support for SME:

- Informational provision supposes reception, collection, and storing of information, its analysis, processing of data necessary for making managerial and strategic decisions. In our opinion, the stated function should include informing the institutes of infrastructure and small entrepreneurship of the planned programs of support, of the rules of its provision, and of used instruments and order of reports;
- Forecasting – foreseeing the perspectives of development of events, phenomena, or processes, and possible state of infrastructure, as a managed object, in the future. Forecasting includes the process of modeling which supposes creation of certain model of socio-economic relations for foreseeing the decision for foreseeing the solution of managerial tasks in future. Modeling is the methods of forecasting, so we shall not distinguish it into separate function, as is done by many scientists;
- Planning – includes creation of certain quantitative and qualitative indicators of development of processes or phenomena in the system of management for specific date. As a rule, the plans are built on the basis of forecasts, contain more specific goals and tasks, and are obligatory, unlike the forecasts. This function includes the creation of programs of socio-economic development of country, regions, municipal entities, and particular spheres, as well as creation of the program of support for small entrepreneurship. In this sense, the plan and program are synonyms. Development of programs is closely connected to project activities, which is totality of measures and tasks, related to development of unique object. Thus, the function of planning, in our opinion, includes development of plans, projects, and programs of development of infrastructural support and small entrepreneurship (Ahmed et al., 2014);
- Organization – formation of system of management, setting its principles, subject list of plans' performers, and responsible for their implementation, setting the staff and resources as to performed tasks;
- Coordination – supposes coordination of joint activities of various subjects of managerial decisions in time and space for achievement of set goals and tasks of management;
- Regulation – setting obligatory requirements and procedures for objects of management, determining the order of activities, and giving orders to persons and subjects. In our opinion, the function of regulations includes two other function: management and ordering;
- Accounting – fixing the data, expressed in quantitative and qualitative indicators, on the state of the system of management for specific date and specific period;
- Control – determining correspondence or deviation of actual state of the system of management from set parameters and goals (Rossinskiy & Starilov, 2009).

3. Results

3.1 Model of Conceptual Foundation of Management of Infrastructure of Support for Small Entrepreneurship

As a result of conducted study of conceptual foundation of the process of management, as of targeted influence of the subject of management in the object of management, the infrastructure of support for small entrepreneurship was chosen as an object of management. As the subject of management, bodies of state power and local authorities were chosen. According to the authors, conceptual foundation of management of infrastructural support for small entrepreneurship – for the purpose of realizing the sense of the infrastructure itself – should include the subject of management as influencing link, methods and forms of management, principles, functions, and object of management which in our case is variety of institutes of support for small entrepreneurship. The purpose of development of the concept of management of infrastructural support is to increase the number of small enterprises, to increase self-employment and employment, to increase the efficiency of work of small enterprises, and, accordingly, to increase its share in the gross domestic product (GDP) and gross regional product (GRP), through the complexity of provision of infrastructural services (Kiselev et al., 2015).

The infrastructure of support for SE performs the role of controlled objects in the model of management; it can be presented as a mechanism of creation of favorable conditions for effective work of SE, triggered into action by managed influence.

The key role in creation of favorable conditions for development of SE belongs to the program of the Ministry of Economic Development and Trade – its purpose is co-financing from federal budget of regional projects for financial, property, informational, and other support for small and medium enterprises. The volume of budget financing grew over the last 10 years by 12 times, and the program was implemented in 2005 by 55 subjects of the RF, and in 2014 their number constituted 85, including Crimea (Table 1).

Table 1. Volume of budgetary provisions for implementation of financial program of support for small and medium entrepreneurship in 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of the subjects of the RF which participate in the program	55	64	6	67	82	82	80	82	83	85
Actual volume of financing from federal budget, million rubles	1,500	2,889.8	3,278.8	3,613.5	18,634.4	17,820	17,823.7	20,800	19,786.9	19,374.8

Source: Ministry of Economic Development and Trade of Russia.

In 2014, according to the program of Ministry of Economic Development and Trade, the financing of the following measures was performed: provision of grants; subsidizing expenses for purchase of leasing equipment and for implementation of modernization projects, for developing of regional guarantee and micro-financing organizations, implementation of educational programs and programs of social entrepreneurship, and for creation of infrastructural objects.

However, these measures of support for SE are not enough at the modern stage. Entrepreneurs still are not satisfied with the conditions for doing business. In 2013, there was conducted the Russian initiative survey by All-Russia Public Opinion Research Center. 1,600 people were questioned in 130 communities and 42 oblasts, krais, and republics of Russia. Statistical error didn't exceed 3.4% (Table 2).

Table 2. Conditions for development of small business in Russia

	2009	2013	deviation
1. Very good conditions	3	2	-1
2. Rather good	27	23	-4
3. Rather bad	31	38	7
4. Very bad conditions	13	17	4
5. Cannot say	26	20	-6
TOTAL	100	100	-

Source: Entrepreneurial climate in Russia – 2013: Results of All-Russian survey

This data shows the aggravation of condition for small business in 2013, as compared to 2009. The number of respondents which evaluated the conditions positively, reduced by 5% (variants 1 and 2, and the number of negative evaluations increased by 11% (variants 3 and 4). These evaluations contradict the resonant statements

from the Russian government as to the necessity for development of small business and alleged numerous measures and programs for its support. Statistical data shows its stagnation and are a signal for transition to completely new level of state's attitude towards small business and increase of efficiency of state policy in this sphere.

Accordingly, the further efforts of the state and municipal entities should be aimed at creation of favorable conditions for doing business, the basis of which are infrastructural objects.

Modern infrastructural objects of support for SE include:

- specialized state structures;
- public entrepreneurial unions;
- business incubators;
- industrial infrastructure;
- innovational infrastructure;
- leasing companies;
- informational agencies;
- consulting agencies;
- educational structures;
- financial and credit organizations;
- funds of support for SE;
- regional centers for coordination of support for export-oriented SE;
- social infrastructure;
- institute of ombudsman.

Studying the mechanisms of support for development of SE, it should be noted that it has 2 forms: direct support, provided for small enterprises, and indirect support, provided through institutes of infrastructure. At the modern stage of development of economy, indirect support is the most effective one.

The system of management of infrastructure of support for SE requires determination of methods of management which can be classifies according to various aspects (Vasilyeva & Petrovskaya, 2010). There is the unambiguous division of methods of state and municipal management as to the character of influence on controlled system into direct and indirect ones – which are mostly known as administrative and economic ones (Petrov, 1972). We think that these methods are acceptable for managing the infrastructure of support for SE.

Administrative (direct) methods are characterized by direct influence on the infrastructure of support for SE and express the will of performers with the help of direct one-sided legal orders or indirect regulatory influence on the corresponding institutes of management. The methods are characterized by power motivation, compulsion, and control. The list of such methods is rather wide; it includes the following methods (Larionova, 2012):

- norming, standardization and certification, regulation, licensing, registration;
- imposition of fine and administrative arrest;
- HR, custom, trade, sanitary, ecological, and fire control;
- giving orders, conducting procedures of bankruptcy, implementing bans, etc.

Significant administrative methods of management include the methods of control which are organized in various forms, including through applying for various reports and information, front and selected checks, documentary and actual revisions. The conducted control should not be total, and controlling bodies should not violate the rights of business subjects and pursue their own interests.

Economic (indirect) methods include the methods of state management, related to the use of economic means, and financial and investment resources. By operating such economic institutes as property and entrepreneurship, state authorities can achieve a lot in implementation of set goals and functions of state management (Administrative law of the Russian Federation, 2013). Economic methods of management include: methods of financial, money & credit, and budgetary & tax regulation, privatization, material stimulation, support for depressive territories, subsidies and subventions, use of tax and property subsidies and material sanctions, stimulation of performers for high-quality and timely solution of set tasks, optimization of tariff rates, reduction

of custom rates, etc. According to economists, these methods are based on two main factors – initiative and interest. The performer should receive profit, effectively performing his functions in the interest of state (Larionova, 2014). It its turn, the state should conduct financial and budget policy which stimulates the effective work of corresponding institutes, simultaneously improving the inter-budget relations, reducing the volumes of ineffective expenses, increasing state investments in perspective and vital projects, and restructuring state obligations. At the modern stage, the powerful managerial levers are the methods of state and municipal orders, flexible taxation, limitation of absolute power of natural monopolies, and export-import regulation. The use of cleverly combined methods of economic management, the need for total administrative control disappears.

Management has three forms. The proprietary research states that it is necessary to distinguish two notions: "forms of management" and "methods of management". Method of management is an important legal means which is a variety of means and methods used by state authorities and their official bodies within limits, set by the law, in order to perform management and administrative influence as to certain persons and objects. Form of management is a certain external manifestation of managerial actions (management) performed by state authorities (of federal and regional level) and by local authorities.

Forms of management are classified according to various aspects. Let us present the classification by Y.N. Starilov (Rossinskiy & Starilov, 2009). According to him, forms of management could be divided into two large groups: legal and non-legal. Legal forms of management include legislative and law-enforcement, regulatory and law-enforcement. Legislative form of management is related to creation and development of legal norms, their discussion and confirmation. Law-enforcement form of management supposes compliance with laws and regulations for the purpose of usage of norm of law is special cases, i.e., consideration and settlement of disputes and managerial cases take place within this form. The next form of management is regulatory – it is aimed at creation of necessary conditions for public management which ensures the well-being of society and state, implementation of management functions in the sphere of state regulation, economic, administrative, political, and socio-cultural development. Law-enforcement form of management is related to performance of control managerial function.

Non-legal forms of management, or, as they are usually called, organizational forms, include (Parmenter, 2007):

1) Organizational actions or measures: meetings and conferences; distribution of positive experience and information about negative phenomena and processes in management, as well as providing practical help for local performers, development of methodological recommendations, etc.;

2) Material & technical actions. This form of managerial activities should provide the efficiency of state and service activity, being related to records management; registration, copying and sending documents, materials, certificates, analytical calculations; material & technical provision; information processing (Rossinskiy & Starilov, 2009).

3.2 Principles of Management of Infrastructural Support for Small Entrepreneurship

The conducted research allowed concluding that management of infrastructure of support for SE should be based in the basic principles. Let us formulate the following principles, on the basis of proprietary treatment:

- targeted orientation;
- dependence on territorial development;
- systematicity;
- economic independence of process members;
- mobility and flexibility;
- balance of infrastructural provision;
- integrity and interconnection;
- complexity of provision of services;
- synergetic effect;
- openness (transparency);
- accessibility;
- competitiveness;
- membership;

- efficiency, rationality, and principle of effective control.

The principle of sectorial orientation is the priority of goals of socio-economic development of Russia (region), coincidence of targeted landmarks of development of infrastructure with strategic goals of development of Russia and particular regions.

Principle of dependence on territorial development. Formation of goals and tasks of infrastructural support for SE requires preservation of interests of territories, on the basis of their geographical, demographic, economic, social, raw material, natural, and scientific potential.

Principle of systematicity. Infrastructure of support for SE should function as a single system with the following peculiar features: goals and tasks, subject and object, functions, organizational structure, integrity, independence and interconnection of system elements, of certain forms, methods, mechanisms, and instruments.

Principle of independence of business subjects. Each organization in the system of infrastructural support for SE chooses independently the type of activity, takes responsibility for expenses, and distributes profit – except for organizations which are owned by state or municipalities.

Principle of mobility and flexibility. Means the change of structure of infrastructure subjects and offered services, works, and production according to requirements of the time. It should be noted that according to structural changes of economy, there appear new elements of infrastructure which facilitate the development of nanotechnologies, social innovational infrastructure, etc.

Principle of the balance of infrastructural provision. At present, a perspective element of strategic planning and management is implementation of the principle of balance which is based on cause-consequence connections between links of controlled system and which takes into account joint influence of its parameters and factors. General meaning of the term “balance” is determined by definitions dictionaries as “correlation of mutually casual parts and elements which ensures normal functioning and work of smth”. Well-balanced object is the object in harmony, balanced as to all components, accommodated, etc. (Rudenko, 2015).

Principle of integrity and interconnection. It supposes regulation of provision of infrastructural services in integrity and interconnection of federal bodies of state power, state authorities of the subjects of the Russian Federation, and local authorities. It is necessary to clearly determine the limits of authority at each level of the sphere of joint management. Local authorities should not contradict the state authority; being interconnected, they facilitate better provision of infrastructural services.

Principle of complexity means that the system of management of infrastructure should include all basic functions of management for provision of basic infrastructural support for implementation of plans and creation of favorable conditions for functioning of SE.

Principle of synergetic effect. Profit, received in the form of GDP, GRP, and budget revenues, should exceed profit received by certain object or subject of infrastructure.

Principle of openness (transparency) facilitates quick acquisition of information about existing forms of support, rules, and results of its provision.

Principle of accessibility. Infrastructural support could be granted to any small enterprises, regardless of the form of ownership, sphere of activity, or territorial belonging. Conditions of the provision of certain type of support are criteria, determined by certain project of program.

Principle of competitiveness. Development of competition between organizations of the system of infrastructural support for SE facilitates better and more effective provision of services. The state should eliminate the possibility for monopoly in provision of any infrastructural service.

Principle of membership. Institutes of infrastructure of support for SE, like small business, should take part in formation and implementation of state policy in the sphere of development of small and medium entrepreneurship, expertise of projects of regulatory acts of the Russian Federation, regulatory acts of the subjects of the Russian Federation, and legal acts of local authorities which regulate the development of small and medium entrepreneurship.

Principle of effectiveness and rationality supposes that the effect from supporting SE in the form of the growth of GDP, financial revenues, and population employment should be higher than expenses for support for SE – otherwise, instruments of support are ineffective, so they should be reconsidered and corrected.

At the modern stage, the key aspect is the support for innovational business through reduction of administrative barriers for start and development of innovational initiatives and formation of requirements of delivering the part of state orders for research & development works to small and medium innovational business.

4. Conclusion

Implementation of the offered model will start the mechanism of infrastructural support for SE through managing influence of the state and municipal entities. The general result of the implementation of the concept could be the following:

- growth of the number of SE;
- creation of new jobs;
- reduction of unemployment;
- development of competition and consequent provision of better production (works and services);
- economic growth of country due to increase of GDP;
- increase of tax revenues into budget;
- growth of investment potential of small entrepreneurship;
- increase of the population life quality;
- increase of efficiency of authorities in the sphere of support for SE;
- improvement of economic situation and stabilization of social sphere.

The further development of conceptual foundations of management of infrastructural support for small entrepreneurship is seen in analysis and monitoring of services and works provided by infrastructure of support for SE, determination of the top-priority ones, evaluation of their efficiency, and detailed development of the tree of goals and perspective vector of development.

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Methodological Aspects of Strategic Management of Financial Risks during Construction of Hotel Business Objects

Elena A. Dzhandzhugazova[1], Natalia A. Zaitseva[1], Anna A. Larionova[1], Maria V. Petrovskaya[2] & Vladimir Z. Chaplyuk[2]

[1] Plekhanov Russian University of Economics, Moscow, Russia

[2] Russian University of Friendship of Peoples, Moscow, Russia

Correspondence: Elena A. Dzhandzhugazova, Plekhanov Russian University of Economics, Moscow, Russia. 36 Stremyany St., Moscow, Russia. Tel: 7-905-545-2987. E-mail: lena-itig@mail.ru

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Abstract

The article substantiates the actuality of strategic management of financial risks during construction of hotel business objects. Two main strategies of hotel business development are described: strategy of geographical expansion, based on the active entering the new markets by means of starting the larger number of standard hotels, and focused geographical strategy which supposes lower growth rates, as the growth is achieved by means of increasing the number of hotels with unique and first-class service and unmatched atmosphere. Financial risks are viewed in the article as many-aspect notion, depending on multiple factors of external and internal environment of a hotel enterprise. It is substantiated that formation of financial and economic model of risks management should be based on a complex approach to the analysis of the environment of organization functioning. At that, a special attention in these models should be paid to the risks related to financing of investment projects and evaluation of their cost. The authors offer and describe the strategy of hotel business development with implementation of targeted function of management – cost increase. This model allows determining the directions of hotel business cost increase and finding the main vector of development. The showed results of research supplement the existing approaches to strategic management in hotel business and stipulate the formation of methodological instrumentarium which allows minimizing financial risks during construction of hotel business objects. Implementation of well-balanced model of the structure of sources for financing hotel business enterprises will allow determining risks at the stage of construction, evaluating their significance, and developing timely measures for their minimization and liquidation.

Keywords: hotel business, risks, well-balanced model, strategy, construction

1. Introduction

One of the necessary conditions for constant growth of economy, achievement of competitiveness, and development of enterprises of construction industry in Russia is increasing the efficiency of investment activities. At that, the probability of losses from investments grows significantly with the increase of the level of expected income from investments (Kovalev, 2015).

Investment construction projects require significant financial investments, so the level of risk increases. While investing into the object of hotel sphere, it is necessary to take into account the dependence of acquiring income on ratio of demand and offer in the specific market and specific region, on the popularity of a brand, etc.

While studying investment construction projects in the hotel business, it should be noted that hotel business in Russia is one of the economy spheres which develop very quickly and successfully. Hotel market includes large companies which unite multiple brands, particular international and domestic hotel chains, and independent hotels. The Russian brands are moving up in the rankings rather slowly, but still the hotel marketing has a lot of perspectives – as more than 60% of the Russian hotels work with little-known brands (Egorov et al., 2010). Most of the hotel chains stick to the strategy of extensive growth. At the modern stage, it is possible to allocate two models of this strategy. The first one is aimed at the active and quick penetration into the new geographical markets, starting a large number of standard hotels, and formation of the branched network – this is the strategy of wide geographic expansion; it includes the hotel chains Hilton, Accor, and InterContinental (Zaitseva, 2013).

The second model of the strategy of extensive growth is characterized by lower rates of growth, as the growth is achieved by means of increasing the number of hotels with unique and first-class service and unmatched atmosphere and focused geographical strategy – these include hotels of the chains Baglioni, Kempinski, and Rocco Forte Collection. In markets with high competition, such as hotel market of Moscow, hotel chains use the strategy of acquiring new segments (Vinogradova & Larionova, 2014).

Nowadays, the Russian hotel business undergoes one of the most difficult periods – as almost any sectorial market reacts to crisis phenomena; hotel chains reconsider and make allowances into their strategies. Consequently, the issues of reconsidering the strategic priorities of hotel business remain topical. Despite the large number of studies devoted to the problems of strategic management (Nonano et al., 2005; Copeland & Murrin, 2005; Lityagin, 2010; Martin, 2006), their scientific elaboration is not full on the whole and, in particular, in the sphere of strategic management of risks as to the hotel business.

Financial risks of hotel business are different at the stages of design, construction, start, and exploitation of the hotel. Unlike the many scientific works on financial risks in hotel business, this research concentrates on the study of methodological aspects of strategic management of financial risks at the stage of design and construction of the hotel business objects, i.e., it is based on the authors' studies in hotel business and construction sphere.

2. Methodology

The issues of the meaning of economic risks and the reasons for their emergence and classification are viewed in the works of such foreign economists as A. Marshall, I. Schumpeter, J. Cowell, J. Pickford, P. Bernstein, and others (Parmenter, 2007; Graboviy, 1996; Popelnyukhov & Kapyrin, 2013).

Over the last years, the research in the sphere of evaluation and management of risks in various spheres of economy was conducted in the works of the following Russian scientists: A. Asaul, V. Abchuk, I. Balabanov, P. Grabovoy, K. Gumba, Y. Panibratov, S. Popelnyukhov and others (Vinogradova & Larionova, 2014; Lukasevich, 2007).

Most of the works of the Russian and foreign authors are devoted to the study of the strategies of hotel business: P. L. Ingram, O. Gilbert, Kapur, V. S. Katkalo, M. Y. Layko, A. D. Chudnovskiy and others (Martin, 2006).

Risk is a multi-aspect notion, so at present, economic literature does not provide unambiguous understanding and approach to the complex evaluation of risk in construction in view of the factors of the environment of functioning and the choice of better variant. According to K. M. Gumba (2009), the problem of construction innovational business is difficulty in choosing perspective projects, i.e., absence of universal methodology of efficiency evaluation.

The mechanism of taking managerial decisions in construction should initially provide the evaluation of possible risks, their classification as to the level of manageability and influence by the organization's managers. This allows determining the variety of risks and allowable limits of their changing which can be influenced by construction organization, as well as determining risks which should be taken into account due to impossibility to influence them. According to P. G. Grabovoy, justified or allowable risk is a necessary component of the strategy and tactics of effective management (Grabovoy, 1996).

Formation of financial and economic model of risk management should be based on the complex approach to the analysis of the environment of organization functioning. Special attention in these models should be paid to the risks related to financing investment projects and evaluation of their cost (Vasilyeva & Petrovskaya, 2010). At present, according to S. N. Popelnyukhov (Popelnyukhov & Kapyrin, 2013), effective management of aggregate risk is impossible without use of special methods of analysis and management. It is advisable to develop complex systems of analysis and management of risks which take into account the changes of informational and methodological basis, including the most effective achievements and their modifications. These systems will allow reflecting all processes of functioning of construction projects in time with necessary level of precision, determining private and aggregate risks and reasons for their appearance, forming criteria of evaluation on the basis of strategic goals, evaluating the level of influence of risks on market cost of enterprise, and choosing the best variant from their totality.

Strategic management is one of the most popular means for management. Theoretical development goes behind the practice of changes in turbulent, chaotic, and non-linear environment, which causes constant actualization of the aspects of strategic management (Royer Paul, 2000).

Classical model of strategy development includes mission formulation, strategic analysis, development of strategic goals, determination and evaluation of variants of strategic development, implementation of strategy,

and evaluation of its efficiency (Kovalev, 2006; Lityagin, 2010). Strengthening of strategic accents in management, in view of which not only the current profit but the profit of future period and the sources of its generation are evaluated (Copeland & Murrin, 2005), predetermines the substantiation of each stage of development of the strategy of development taking into account the changes of business market cost. Each stage of management is a whole complex of actions and procedures which include instruments of financial substantiation of changes in business market cost. The stage of strategic analysis includes the use of not only traditional approaches of financial analysis, expert evaluations of strong and weak financial positions of enterprise, as compared to rivals, but also evaluation of hotel business at the current period. The main task of this stage of financial substantiation of the development strategy consists not only in diagnostics of the state of hotel business at the current period but in determining the strategic position, allocating possibilities and threats for functioning in long-term, for further forecasting of future income. The complex analysis of future incomes and implementation of the strategy requires the determinants of the cost of hotel business and evaluation of the level of their mutual influence (Royer Paul, 2000). Choosing strategic alternatives consists in the evaluation of strategic decisions which ensure various changes of the cost: construction of new hotel, temporary shutdown of construction, or continuation of a project and setting into operation, which is the basis for strategy development. The strategy of hotel business, aimed at the cost increase, can be reached by evaluation, monitoring, control, and management of determinants of cost which correspond to the main elements of the model of economic value added. Evaluation of implementation of the strategy is supplemented by the system of operative indicators for account of influence of decisions, made at various levels, on the business cost.

Changes in hotel business, aimed at the growth and development of cost and investment attractiveness, can be achieved by evaluation, monitoring, control, and management of main channels of cost formation which correspond to the main elements of the model of economic value added (Smith, 1996).

The advantage of the model of economic profit consists in the fact that it characterizes the results of activities in a particular year, allows evaluation the efficiency of work of enterprise on the whole and of its departments. It is a tool for universal evaluation of business; among other things, it is used for non-public companies (which are most of hotel enterprises), being an indicator of the quality of managerial decisions and proving the increase of enterprise cost, while the opposite shows its reduction:

$$EVA = IC * (ROI - WACC) \tag{1}$$

where: EVA – economic value added

IC – invested capital;

ROI – return on investment;

WACC – weighted average cost (price, expenses) of capital.

The cost of enterprise with the use of the model of economic profit is calculated with the following formula:

$$V = f(IC, PV(EVA)) \tag{2}$$

where V – market cost of hotel business;

$PV(EVA)$ - given EVA.

One of the main problems for creation of strategy of development, oriented at the growth of market cost, is evaluation of the risk level of investor and management of financial risks. The complex system of risk management is a dynamically developing system, the strategic aim of which is provision of necessary level of market sustainability and protection of capital from negative influence of the factors of the environment of functioning (Miller & Bromiley, 2001). Such system should include the totality of interconnected sub-systems which allow performing the following processes: forecasting, rational organization and provision of activities with necessary resources, control of their use, allocation of the reasons for changing of main factors which influence the efficiency of organization's functioning, calculation of the level of their influence on the quality of resources management, and development of task-oriented measures which allow eliminating or reducing the organization's losses as a result of unfavorable influence of these reasons. The goal of each sub-system should be formed in view of the strategic goal of the complex system of risk management, which will allow conducting well-balanced approach between maximization of income and aggregate risk (Ahmed, El Rajy, Goraya, & Kausar, 2014).

Each of the described sub-systems is characterized by a certain list of factors – e.g., the sub-system of selection of sources for financing investment project should include such factors as own assets (EC), borrowed assets (DC), total ties between components of sources (R), total factors which characterize the state and structure of sources of financing Fsif, and total conditions, requirements, and limitations between components of sources for financing, according to the legislature and normative values for the sphere (Qsif).

This will allow setting threshold values of profitability of financing sources (FR1tsif), minimum allowed share of owners in the business (FR2tsif), and the threshold of mobility and sustainability of own assets which allows keeping control of the business in the period of formation of the structure of financing sources (FR3tsif).

A necessary condition for evaluation of the quality of the model of structure of sources for financing the innovative activities is the following limitation: cost of the source of financing the innovative activities (WACC) should be lower than profitability of invested capital (FR1sif).

In view of the above mentioned, the well-balanced model of the structure of sources for financing the innovative activities has the following form:

$$F(Sif) \rightarrow MAX \quad (3)$$

$$Sif = (EC, DC, R, Fsif, Qsif) \quad (4)$$

$$FR1sif \geq FR1tsif \quad (5)$$

$$FR2sif \geq FR2tsif \quad (6)$$

$$FR3sif \geq FR3tsif \quad (7)$$

$$WACC < FR1sif \quad (8)$$

The offered model can be used for formation of the sources of financing of any types of activities and will allow selecting the most optimal variant.

3. Results

Based on the results of the conducted research, it is possible to conclude that, despite the unfavorable geopolitical and economic situation, investors didn't lose interest to hotel market. The current situation influenced mostly the development of new projects, as the opening of four hotels with total 2,000 rooms, planned for 2014, was moved to 2015. At that, all hotels under construction are to be finished and put into operationю, but the new projects, which are at initial stages, are being temporary shut down. While a while ago, hotel chains preferred to expand their presence in the cities with more than million people, now they concentrate on regional centers with population of more than 300,000 people (Zaitseva, 2013).

Let us cite the results of the survey by the analytical company EY, devoted to the tendencies of development of hotel business in Russia and current economic situation. The company questioned 65% of developers and 35% of hotel operators. The survey showed that 63% of hotel operators did not chang their business strategy due to difficult geopolitical situation and sanctions pressure on the Russian economy, and only 37% of operators put freeze on their plans for development. The hotel developers also consider the current situation to be a stable one. Thus, 33% of developers think that their business is profitable, and 54% - that it is stable. At that, more than 60% of questioned operators and developers plan to optimize expenses and do business in a more efficient way. The studies of the article's authors also confirm these evaluations and tendencies.

On the basis of the conducted analysis of the situation as to construction of hotel objects, for correcting and creation of development strategy, the authors offer the most effective – in view of current conditions – strategy, founded on the implementation of the specific function of management – cost increase. This strategy of hotel business, aimed at cost increase, can be achieved by evaluation, monitoring, control, and management of determinants of cost which correspond to the main elements of the model of economic value added.

This model allows determining the directions for hotel business cost increase and allocating the main vector of development: increase of profitability of invested capital; expansion of business – increasing room supply, developing multi-brand business; combining ownership and management of a hotel; independent development of hotel business or joining a chain; optimization of the cost of invested capital.

Uncertainty of the current situation in the Russian Federation and in the world on the whole, caused by current economic conditions, raised the level of financial risks, and, as a result of sanctions against the Russian banks,

the costs for attracting sources of financing grew substantially. That's why the initial task is to optimize the cost and structure of invested capital.

For the purpose of formation of the structure of sources, the authors offer the well-balanced model of the financing sources structure. Implementation of the offered model allows:

- Identifying basic risks for activities which influence economic potential. The risks, related to investments into hotel business, are rather specific and not peculiar for investing into other real estate. The examples of basic risks for hotel sphere are the following: hotel rating, level of occupancy, reduction of average cost of accommodation, quality of service, level of management efficiency, etc.;
- Allocating reasons for emergence of basic risks and classifying them into controllable and uncontrollable;
- Setting interrelations between the reason for risk emergence – taking into account that the same basic reason can influence the change of various basic risks;
- Forming the model of "possibility for influencing the risk causes" and evaluating the quality of financing sources;
- Evaluating financial costs, related to financing the elimination of internal causes of risk. As to the causes which can be managed and controlled by enterprise, there are various variants of influence – so there may be developed alternative variants of measure, stipulating the reduction of their negative influence. For example, if the basic cause of risk is insufficient qualification level of production workers, the following measures are possible: increasing qualification of employees on the workplaces of organization, increasing qualification level through the system of retraining in the sphere, organizing visits to similar enterprises, etc. As a rule, implementation of such measures is connected to financial expenses required for their financing;
- Selecting the sources of financing of measures as to reduction of the level of risk spectrum of organization;
- Planning financial results for the following period, on the assumption of the strategic goal of functioning.

At that, it should be noted that all above mentioned advantages of the offered well-balanced model of financing sources structure could be realized only under the condition of effective system of corporate management.

4. Conclusion

In view of the results of the conducted research, it is possible to conclude that the results of the research, given in the article, supplement the existing approaches to strategic management in the hotel business:

- Including procedures of financial substantiation of the strategy of development of hotel business which take into account the change of market cost;
- Possibility for managing the determinants of cost at various levels of management;
- Specification of the procedures of managing financial risks at the stage of hotel construction.

The offered model takes into account the most effective methodologies for creation of a complex system of risk management, which allows rational use of not only existing mechanisms of risk management but also of methods which are modified on their basis, in view of the specifics of activities of particular organization.

Implementing a well-balanced model of financing sources structure of hotel business enterprises allows allocating risks and their meaning at initial stages and developing measures for their minimization and liquidation. That's why the results of this research will be used by construction companies which are involved in construction of hotel objects and by managing companies and owners of hotel business, for increasing the efficiency of investment projects implementation.

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Institutional Aspects of Provision of Sustainability of Budget System of the Russian Federation

N. G. Vovchenko[1], O. B. Ivanova[1], E. D. Kostoglodova[1] & T. F. Romanova[1]

[1] Rostov State University of Economics, Rostov-on-Don, Russian Federation

Correspondence: N. G. Vovchenko, Rostov State University of Economics, 69, Bolshaya Sadovaya str., Rostov-on-Don, 344002, Russian Federation. Tel: 7-863-263-3080. E-mail: main@rsue.ru

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Abstract

The article views institutional aspects of provision of budget system of the Russian Federation in the context of development of financial institutions for strengthening of income base of budget system, reduction of non-oil and gas deficit, targeted use of budget assets, increase of debt sustainability of budget, increase of effectiveness and transparency of budget system, and creation of stable financial conditions of development of the Russian Federation.

Keywords: financial institutions, fiscal transparency, budget sustainability

1. Introduction

Financial institutions have a systematizing role in fiscal system, as they create foundations for socio-economic development of the state. At that, their formation should be oriented at the best foreign practices from the point of view of implementation of institutions (including expenses for receiving necessary information concerning institution, its distribution, signing corresponding contracts, and passing the laws), which will facilitate the achievement of socially significant results and sustainability of budget system.

Large importance and significance of institutions in economic reality is widely known. Definitions “institutions”, “institutional environment”, “institutional changes”, “institutional structure”, “institutional order” vary a lot. Therefore, it is important to determine their hierarchical interconnection.

According to theoretical basis of institutional theory, institutions are treated as rules and standards of behavior, i.e., they should be viewed as regulatory principles, allowing or forbidding some or other actions. On the one hand, such rules limit or stimulate actions of economic subjects, and, on the other hand, - allow them to make rational choice and forecast the actions of those that surround them (Kuzminov, 2005). Therefore, financial institution is a complex cooperation of formal and informal principles, rules, and norms which determine and regulate activities of person in the sphere of finances.

The main elements of the system of financial institutions are structural characteristics of financial system and the whole socio-economic development of the state. At that, it is possible to distinguish three foundations of institutional elements – regulatory, normative, and cognitive (Scott, 1995).

2. Theoretical Base and Materials

On the basis of the theory of institutional changes of D. North, institutional environment, or institutions, can be presented by group of individuals which are involved into targeted activities. Limitations which are bound by institutional structure (together with other limitations) determine variety of possibilities. D. North considered that the main restraining factor in economic development were transaction expenses which emerge due to the fact that information has a value and is asymmetrically distributed among the parties of the exchange. So, institutional structure decides which types of knowledge are necessary for receiving maximal feedback, and competition urges organizations to constantly invest in receipt of knowledge and experience for the purpose of development and survival (Leontyev, 2011).

In its turn, institutional structure of budget system reflects ordered totality of financial institutions, in which basis the formal and informal rules are in dynamics of development, appearing and supplementing each other in interconnection. The recurring interconnections of economic agents allow forecasting evolutionary tendencies in

development of financial institutions. In this context, it is necessary to determine the order of usage of institutes, i.e., institutional order of budget system. In these approaches, the landmark is definition by M. Olson (Olson, 1998), who thought that institutional order is a systemic component of economic order which determines fundamental regularities while performing economic activities by main agents, independently of spheres and types of activities.

It is possible to suppose that institutional order is similar to the notion of institutional environment, under which one understands a complex of formal and informal institutes and their mechanisms of state regulation, including budget tools which ensure the sustainability of fiscal system.

Behavioral postulates of reformers and lawmakers of institutions and their users often do not coincide. This is due to the difference in views as to the order of society. The reason of this is that very often institutions borrow and copy, without understanding of their functioning in new institutional environment (Dryzek, 1996). Differences between logical understanding of formal and informal approaches lead to institutional traps. This may be referred to fiscal institutions, when their non-efficiency is determined by the gap between financial practices and formal rules. In order for designed financial institution to be effective, it should be functionally necessary and correspond to real economic development.

A huge role in development of financial institutions in particular country belongs to adaptation of the best practices and new theories in the sphere of state finances under conditions of globalization era. Publication of the book "New state finances" changed the understanding of modern development of state finances from the point of view of change of proportion between market and state regulators, understanding of the role of intergovernmental organizations and whether some of their traditional functions could be performed more rationally and effectively by members of global markets or private-public partnerships. All of this proves the thesis that state finances constantly develop. Change of the balance between market and state transformed the methods of management of state finances – both at national level and at the level of intergovernmental organizations. Essentially, international cooperation transforms from intergovernmental process into "multi-actor" process. Under the conditions of new financial technologies, openness leads to interdependence which could be faced only through cooperation (Inge Caul, 2006).

The International Monetary Fund, the World Bank, and the Organization for Economic Cooperation, and other international organizations reconsider the standards and examples of the best practices for evaluation of fiscal transparency, which leads to emergence of many new initiatives and fiscal transparency becomes a mainstream.

In 2014, the International Monetary Fund reconsidered the "Code of transparency in the tax sphere" which determined the set of clear principles, evaluated with the matrix of practices. That is, each indicator within this matrix shall be evaluated from the point of view of compliance of existing practices of budget reports with "basic", "suitable", or "leading practice". In other words, there is a certain set of tools, the use of which is recommended by international organizations for provision of fiscal transparency, but still there is no common standard. That's why these tools have to adapt to the interests of specific users within particular country.

Traditionally, the quality of the system of management of state finances is evaluated through indicators of common economic and fiscal stability, effectiveness of distribution of expenses, and operational efficiency. Thus, the IMF defines fiscal transparency as "fullness, clarity, authenticity, promptness, and actuality of state financial reports and public openness of the process of decision making in the sphere of financial policy". In 2012, the UN passed the "High-level principles on transparency". In this context, fiscal transparency facilitates the increase of efficiency of state expenses, improves access to external financing, and reduces fiscal risks. Main tools that allow increasing the transparency include publication of budget reports and compliance with international standards (Morgner, 2015).

The goal of fiscal transparency is the increase of efficiency of economic policy by means of deleting uncertainties in the sector of state finances and the increase of external control. Empirical research proves that fiscal transparency not only improves the indicators in the sphere of state finances but reduces the cost of state loans, reduces the actuality of the problem of corruption, increases the probability of the fact that effective, just, stable, and sustainable fiscal policy will help to achieve positive economic, social, and ecological effect. Together with fiscal transparency, in order to provide the possibility of comparing different countries, the index of budget openness is determined – which is a direct average of quantitative evaluations of 95 items of survey that refer to the problem of budget openness, normalized according to the scale of 0-100. The index of budget openness of Russia from 2006 to 2012 increase from 47 points out of 100 to 74 points, and Russia left the 28th position out of 59 countries to the 10th position out of 100 countries (Richard Hughes, 2014).

3. Results

In the sphere of provision of budget sustainability in the Russian Federation, a very important role belongs to strengthening of institutional order of budget system of formation of its sustainable institutional environment, namely: strengthening of budget foundations (including adaptation of budget rules, non-budget mechanisms of excessive financing, modern evaluation of budget risks, increase of fiscal transparency; reforming state expenses (based on strengthening of tax and budget discipline and increase of effectiveness of management of state expenses, determination and specification of current expenses); pension reform (based on effective management of long-term budget expenses, balance of pension sources, and transparency of pension plans); strengthening of foundations of monetary policy and evaluation of stability of financial sector.

The measures for perfection of incomes of federal budget should be the measures for allocation of reserves of current taxation system: increase of efficiency of state control in regulation of production and turnover of alcoholic products; increase of income from foreign trade operation; increase of tax control for VAT refund; perfection of incomes from realization of mineral resources; optimization of taxes on incomes from realization of measures related to diversification of country's economy; rationalization of system of subsidies; optimization of controlling activity of tax and customs bodies; increase of incomes from federal property. These measures should be aimed at provision of long-term balance and sustainability of budget system and support of necessary financial reserves.

In the sphere of expenses of federal budget, the top-priority directions are the following: social policy, national security, and issues of development of national economy. For the purpose of reduction of risks of execution of expenditures of federal budget, it is necessary to perfect the work as to increasing the quality of management of state finances and effectiveness of use of budget assets. There is a necessity for systemic approach to formation of the complex of state programs aimed at full-scale implementation of program-oriented principle of budget execution. This direction requires formation of single approaches to collection and provision of information on execution of program indicators, perfection of statistic observations of the results of expenditures programs, as multivariance of methods in calculation and methods of receipt of data complicates high-quality control for implementation of state programs. Interrelations of federal budget and budges of state non-budget funds should be aimed at reduction of inter-budget transfers.

This context includes interrelations of the federal budget with the Pension Fund of the Russian Federation which are complicated by the following problems: aberrant incomes of the Pension Fund of Russia due to reduced tariffs, expenses for valorization, expenses for "non-insurance" periods, compensations for accrued but unpaid taxes, and transfer for balance. These problems should be solves with the help of stage-by-stage reforms which conform to the principles of the balance of the pension system: increase of the pension insurance record (up to 15 years), necessary for acquiring right for old age pension; implementing indicator which characterizes minimal volume of insurance taxes necessary for acquiring right for old age pension; fixation of the tariff of insurance taxes into the Pension Fund of Russia for insurance and funded pension; increase of critical value of wages, from which insurance fee is paid; indexation of fixed fee for insurance share of pensions according to the inflation level; termination of pension rights during the period of pension receipt; preservation of values of pension and guarantees for minimal level of pensions for non-employed pensioners (not lower than living wages in the region).

The direction of regulation of the level of deficit of the federal budget should include measures aimed at expansion of sources of internal loans, from privatization, and by means of change of surplus balances on the accounts of the Reserve Fund. As to the Reserve Fund, it is necessary to increase the efficiency of assets management. As to the National Welfare Fund, it is important to implements measures related to financial tools which are aimed for development of infrastructural projects, providing maximal effect of economic growth with minimal risks of assets allocation. A very actual issue is one of the increase of effectiveness of managing assets of the Fund through the increase of its profitability with minimization of interest and currency risks, which is aimed at preservation of sustainability of the budget system. The issues of perfection of management of national debt should be handled simultaneously with the initiatives of modernization of infrastructure of national financial market, reduction of the cost of public borrowings, and preservation of Russia's presence in the international market of capitals.

Also, the primary measures include the "large-scale" budget consolidation, which requires regulation of non-oil deficit and increase of the Reserve Fund and the National Welfare Fund up to the planned levels. Orientation at new rules should destroy connection between tax & budget policy and fluctuations of oil prices – this condition is the most important in preservation of sustainability of budget system.

This budget rule determines substantial limits for federal expenditures, which will significantly decrease their volatility, setting upper limits for federal expenditures at the level of non-oil and gas incomes, calculated according to the estimated oil price.

The new rule is an important institution determining budget sustainability, as it determines the gap between budget and fluctuations of oil prices and supposes the mechanism of reserves. At present, this direction requires certain corrections. This is due to the fact that oil reserves are formed in ineffective way – therefore, there is a necessity for correspondence between upper limits of expenses and budget parameters for three-year plan; it is impossible to redirect yearly streams of oil reserves; non-oil payment credits should reflect on reserve funds. All the above measures should become a real basis for budget planning within the budget process. Reserve funds may be used as financial resources for investments, which should be a strategic vector of development and significant factor of economic dynamics of Russia. It is advisable to conduct reserve funding for Russia, as well as to correct expenditure policy for the sale of preservation of reserve assets.

Budget reform should have a multi-vector nature of development for the purpose of preservation of financial and economic stability. Thus, in order to preserve the reserves and optimization of expenditure policy, it is necessary to conduct structural reforms. Structural budget reforms should implement: parametric pension reform; increase of efficiency of budget expenditures with perfection of evaluation of investment expenses and inspection procedures; constant privatization of government enterprises, especially enterprises with low level of profitability.

In order to solve these issues, it is necessary to prevent the risk components of economic dynamics, which supposes the development of working algorithm of evaluation of risks of economic dynamics of financial transformations, taking into account the risk of oil prices reduction, risk of real outflow of capital, and risk of critical situation in the bank sphere.

The matrix of risk evaluation shows events which can lead to significant change of dynamics of indicators of basic scenario. Besides macro-economic volatility, the state is subject to wide range of budget risks caused by sources which are not easily to take into account in macro-economic analysis. These “discrete” budget risks include:

1) non-macro-economic factors which can lead to deviation of incomes from the forecast to certain side (an example of this is uncertainty as to the use of tax subsidies by population and enterprises);

2) risks related to assets and obligations, including the ones which are not shown on the balance as of now. These risks include re-financing risks and the influence of changes of interest rates, currency exchange rates, and other variables in the value of assets and liabilities belonging to the government (in Russia, balances of large government-controlled companies create significant additional layer of risks in this sphere);

3) contingent obligations, when the state could bear the costs in future, but their value and time are not specified;

4) long-term or unlimited risks which are difficult to be evaluated quantitatively (in Russia, they include expenses for pension provision and healthcare of aging population) (Richard Hughes, 2014).

Analytical evaluation of fiscal transformations proves the necessity for accounting of consolidated changes in fiscal system and directly influences the budget sustainability. Implementation of the set goals requires the landmarks for the formation of program budget aimed at long-term strategy, which, in its turn, increases the quality of formation and execution of the budget.

At all stages of budget process, the initial aspect is the increase of openness and financial transparency of the state sector. Implementation of this direction could be performed within the development of integrated system “electronic budget” with simultaneous unification of document control for budget and accounting information. In addition to the issues of provision of transparency, it is necessary to mention the development of the unified portal of the budget system of the Russian Federation, which should be the main informational resource about state and municipal institutions. Integrity of information requires development and confirmation of federal standards of accounting, including particular standards of state sector. An innovational institution in the sphere of provision of transparency of fiscal activity should be the formation of “budget map” for citizens, which will increase the publicity of information for the purpose of management of state finances and provision of budget openness.

Conduct of the procedures of transparency requires the improvement of the forms and methods of financial control. Financial control and audit should acquire new order for the purposes of elimination of problems and drawbacks in the usage of budget assets and prevention of possible violations, which, it its turn, requires

monitoring and analysis of qualitative indicators of control activity. Monitoring should cover the execution of state tasks and publication of its results on the informational web-site, which, one the one hand, will increase the transparency of budget activities, and, on the other hand, will facilitate the optimization of the use of budget expenditures. These measures will be the basis of formation of efficient informational state system of payments which is a source of incomes of the budget system of the Russian Federation.

In the issues of optimization of the use of state assets and implementation of program obligations, a huge role belongs to the development of institution of public-private partnership, which significantly influences the sustainability of the budget system.

Public-private partnership, while optimizing the combination of budget and non-budget sources on a long-term basis, determines the efficiency of all state projects. Perfection of this institution should feature the additional legal frameworks and new mechanisms of execution of obligations which should include insurance of risks and claims for contracts (concessions) and claims from object's users. Therefore, it is necessary to develop the practice of use of targeted capital (in the sphere of education, science, and culture).

Socio-economic environment of Russia should include the conditions for attracting direct investments and their effective use, so it is necessary to reconsider effective guarantees, financial supports, and tax subsidies for development of public-private partnership.

One of the top-priority institutions in the increase of sustainability is the institution of tax regulation, the work of which should correspond to modern economic development and top-priority directions of economic policy.

Very actual issues are development and effective use of tax on real estate property instead of current tax on land and personal property tax. An important role belongs to differentiated approach to tax on mineral resources extraction depending on the conditions of oil and gas extraction, using the coefficients with reduced value for new and worked-out gas deposits. Activization and protection of financial market under the conditions of development of financial integration and long-term stimulation of investment climate requires the formation of new rules of taxation of operations with securities.

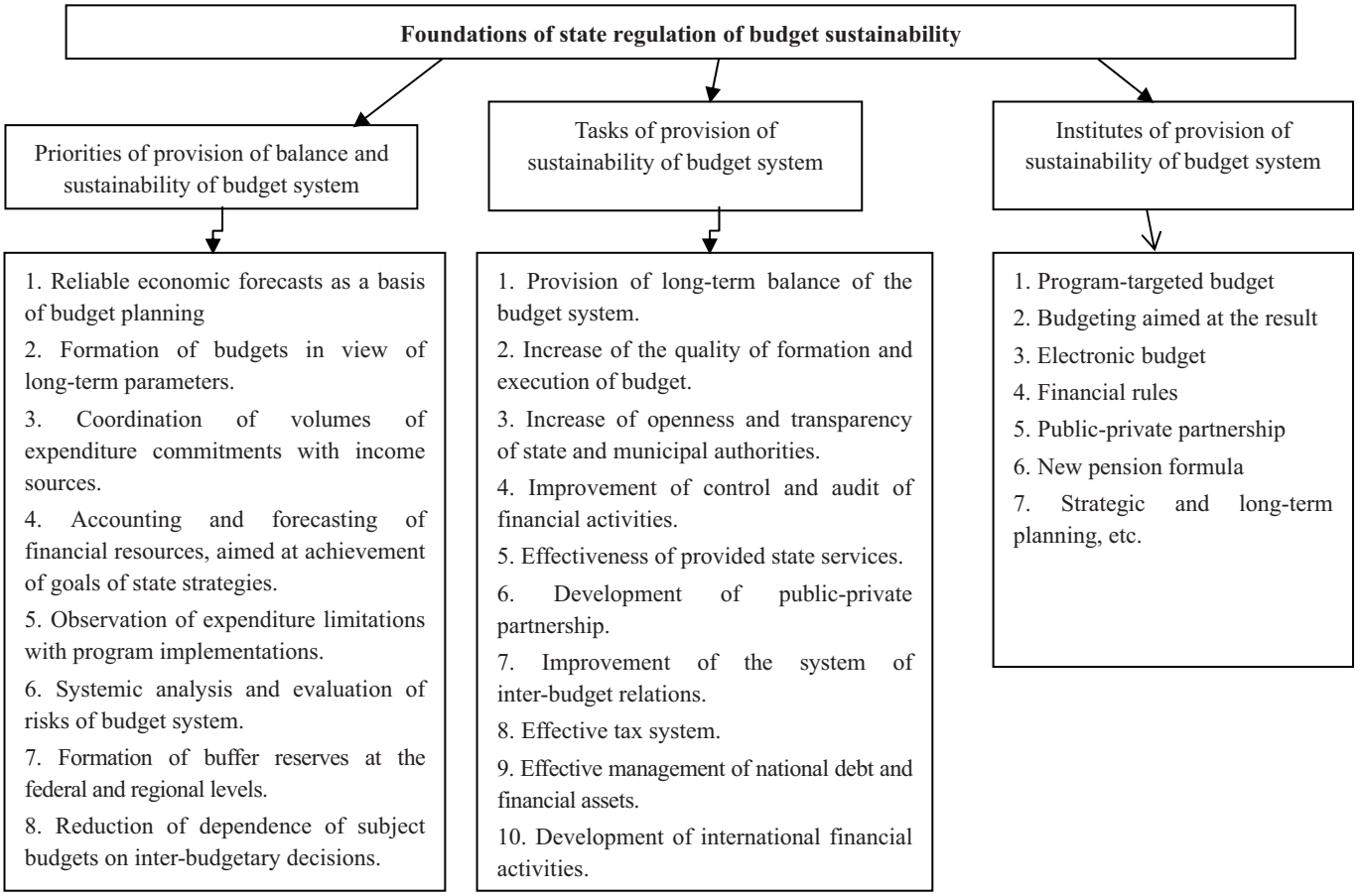

Figure 1. Conceptual directions of state regulation of sustainability of budget system

Full reflection of redistribution of economic resources through the budget requires opening the level of incomes reduction due to tax expenditures. Despite the efforts for evaluation of the value of tax expenses, authorities do not have an official methodology for tax expenses calculation. It is very difficult to directly calculate tax expenditures. Evaluation of losses of budget incomes requires the control tax – defined as a structure of tax rates, withholdings, and accounting regime which would have been created in absence of any tax expenditures. Analysis of tax expenses also requires selecting one of the three methodologies of evaluations: on the basis of lost income, growth of income, or expenses equivalent. The Russian government hasn't yet accepted any official approach.

Issues of preservation of sustainability of budget system and financial system on the whole are related to managing national debt and financial assets. The capital market should become an efficient financial environment for financing the budget deficit and should support the efficient liquidity, ensure the wide range of investors, which will become an important condition for financing of top-priority projects of development of infrastructural spheres of economy and increase the efficiency of managing the assets of the budget system.

An important issue in the preservation of budget sustainability is formation of efficient mechanism of allocation and preservation of free money from the budgets of all levels.

Optimization of all financial operations, regulation, and control require creation of single regulator of financial markets in the basis of the national Bank of Russia. This measure will increase the efficiency of controlling activities through consolidated control. This measure is important for the development of the processes of Russia's integration into the global financial space and for effective investments of budget reserves and pension reserves into investment projects which have national importance. Regulation of financial market will facilitate the perfection of infrastructure of securities market and financial market on the whole, but in this context – formation of accounting standards with the use of International financial reporting standards and accounting, which could be conducted under the supervision of the Council for standards of accounting with orientation at international standards of audit.

Issues of competitiveness of Russia and increase of the fiscal system are related to the development of financial relations at the level of cooperation with international financial organizations and in the direction of creation of such important structure as Council for fiscal stability. Activities of the Council for fiscal stability will be aimed at reduction of systemic financial risks and formation of measures for support for fiscal sustainability, according to the best foreign practices developed by the global financial society.

These measures for development of institutes of budget sustainability should be an efficient landmark for the Budget Code of the RF, which should be included into the state programs for perfection of key stages of the budget process. Effective, transparent, and responsible management of budget process through new institutes is a basic condition for modernization of economy, increase of living standards, and achievement of strategic goals of socio-economic development of Russia.

On the basis of the conducted analysis of institutional order of the budget system, it is possible to determine conceptual foundations of state regulation of budget sustainability in the Russian Federation (Fig 3.2).

The methods of the analysis of the budget system have multi-variant characteristics and are reasoned from the point of view of debt sustainability and from the point of view of risks assessment (Vlasov S., 2013), which has a decisive direction for diagnostics of sustainability and confirms the parameters of "functional finances" (David, 2004) for short-term, mid-term, and long-term perspective.

Evaluation of sustainability of budget system, based on the methodology of the IMF, consists in the usage of aggregated index of fiscal stress which is calculated on the basis of signal indicators in the sphere of state finances. These indicators include the level of national debt, interest rate for national debt, budget balance, etc.

In the selected approaches, the sustainability of budget system should be viewed at the level of budget of extended government and take into account the totality of the budgets of all levels and their totality.

Evaluation of sustainability of budget system of any national system requires the selection of signal indicators. These are indicators connected to the dependence of federal budget from external situation: debt sustainability, volume of export, volume of import, etc.

Therefore, from the authors' point of view, conceptual foundations of state regulation of budget sustainability should be accompanied by modern methods of analysis of sustainability of budget system, including stage-by-stage algorithm of its diagnostics. In this situation, it is advisable to judge from specific conditions of functioning of budget system – in other words, from the current institutional order of budget system.

One of the main indicators of reduction of dependence of federal budget from external situation is reduction of non-oil and gas deficit. If, for example, during 2-3 years prior to the year, prior to the year, for which the federal budget is created, non-oil and gas deficit increases, it is a signal for verification of sustainability of the federal budget.

The following methodological approaches for evaluation of the analysis of sustainability of the budget system of the Russian Federation, based in the step-by-step algorithm, could be recommended.

1. Development of methodology of calculation of aggregated indicators of sustainability of the federal budget on the basis of macro-economic indicators, such as: Urals oil prices, USD/barrel; gas prices (contract average, including the CIS countries), USD/thousand m^3; investments, billion RUB; volume of import (for the range of goods, accounted by the Federal Customs Service of Russia), billion USD; volume of export (for the range of goods, accounted by the Federal Customs Service of Russia), billion USD; profit of profitable organizations, RUB billion; wage fund, RUB billion; GDP, billion RUB.

1st step. Creating trend models for the offered macro-economic indicators.

2nd step. Finding – on the basis of created trend models – forecasting values of stated macro-economic indicators for the planned period.

3rd step. For each year of the planned period, the calculation of the relative indicators reflecting the share of the first seven offered macro-economic indicators as to GDP of the corresponding year.

4th step. Calculation of aggregated indicator of the structure of the federal budget for each year of the planned period.

5th step. Analysis of aggregated indicators of the federal budget structure of the planned period: if these indicators do not differ much or are almost similar, this shows the fairly sustainable federal budget for the planned period; if these indicators are rather different, it is necessary to perform additional analysis of the federal budget structure.

2. Analysis of the federal budget structure on the basis of aggregated index of fiscal stress.

Aggregated index of fiscal stress is calculated in the basis of analysis of signals of the variety of complementary indicators which characterize the structure of the federal budget for the year prior for the planned one (Vlasov S., 2013).

Complementary indicators create three clusters:

1st cluster – *main budget indicators:* national debt (% of GDP); structural initial primary balance (% of potential GDP); interest rate for national debt, adjusted to the rate of GDP growth (predicted average value for 5 years);

2nd cluster – *long-term budget trends:* growth of federal spending for pensions (predicted value in 30 years, % of GDP); growth of federal spending for healthcare (predicted value in 30 years, % of GDP); total coefficient of birth rate; age structure of population in 20 years, i.e., ratio of the quantity of population older than 65 years to the quantity of the full-aged;

3rd cluster – *managing assets and liabilities:* gross financing, i.e., sum of the value of budget balance and national debt to be paid (% of GDP); share of short-term national debt in the total value of national debt; weighting average remaining maturity of national debt (years); ratio of short-term external national debt to the value of gold and foreign exchange reserves; share of external national debt in the total volume of national debt.

Indicators of the 1st cluster how the influence of the policy conducted at the present time and planned for near future; indicators of the 2nd cluster characterize economic and demographic policy in long-run period; indicators of the 3rd cluster evaluate the structure of assets and liabilities. For each of these indicators, the threshold values are calculated with the least number of errors for the forecast of crisis and non-crisis situations. Then, for each indicator, the frequency of errors in the forecast of crisis and non-crisis situations at the level of its threshold value is calculated.

As a result of expert procedure, each indicator is assigned with weight and aggregated index of fiscal stress for the planned year is built.

3. Creating conditions for internal debt paying capacity of the state.

One of the main factors of sustainable long-term economic development of our country is stabilization of national debt and increase of paying capacity of Russia in the long term.

4. Developing the methodology of calculation of aggregated indicator of openness of the budget of the Russian

Federation.

1st step. Calculation of the share of legally valid electronic documents in the total volume of documents of financial and economic activity of federal organizations of state administration sector.

2nd step. Calculation of indicator which characterizes the reduction of the time of processing of financial documentation of federal organizations of state administration sector.

3rd step. Calculation of the share of information, allocated on the unified web-site of the budget system of the Russian Federation in real time

4th step. Determination of the share of subjects (municipal entities) of the RF which have access to the "Electronic budget" system.

5th step. Determination of aggregated indicator of openness of the budget system of the Russian Federation.

4. Conclusion

The offered methodological approach will facilitate the detection of risk factors for sustainable development of budget system and determination of rational targeted indicators for long-term budget planning. New methods of evaluation of sustainability of budget system should be accompanied with new budget rules, which will facilitate the procyclical budget policy for oil and gas share of the budget and support macro-economic indicators at the safe level.

Usage of these approaches for preservation of sustainability of budget system should be the basis for short-term period when orienting at estimate indicators and budget rules in long-term aspect of development of the budget system of the Russian Federation.

Generalizing the above, it is possible to make the following conclusions regarding directions of improvement of institutions of budget sustainability.

The main institutions of provision of sustainability budget system are: strategic planning, program-targeted budget, electronic budget, financial rules, public-private partnership, and new pension formula. Evaluation of sustainability of budget system requires the use of step-by-step algorithm which includes the determination of the following:

1) aggregated indicator of sustainability of the federal budget on the basis of macro-economic indicators;

2) aggregated index of fiscal stress;

3) necessary conditions of internal debt paying capability of the state;

4) aggregated indicator of openness of Russia's budget.

Substantiated directions in determination of sustainability of the budget system will facilitate the strengthening of the balance of the budget system of the Russian Federation, gradual reduction of oil and gas deficit of the federal budget, preservation of the volume of Russia's national debt on the safe level, formation of budget parameters on the basis of current expenditure obligations, and regularity of analysis and diagnostics of risks for the budget system of the Russian Federation, which could be used for long-term budget planning.

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