

**Olga Soboleva**<sup>1</sup>  
**Olga Nogovitsina**  
**Elena Syrtsova**  
**Olga Tokmakova**

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## METHODOLOGY OF REGIONAL GOVERNANCE QUALITY ASSESSMENT

**Abstract:** *The definition of influence factors on economic development of the region remains today the most important issue that will choose the most effective direction of investment, and will allow identifying the highest risks to the realization of actions directed on development of territories.*

**Keywords:** *regional economy, factors of sustainable development of the region, territory governance, quality management*

### 1. Introduction

Economic and social outcomes, the effectiveness of current activity and perspective development of regional economy in conditions of significant changes in the external environment, developing regional markets of innovation and capital depend on the quality of management processes in the region, which determines the rate of renewal and modernization of fixed assets, the creation and implementation of basic and improving technical, technological and information innovations with the aim of increasing the competitiveness of manufactured products and services, reorientation of the material export to the export of processing industry components of the region.

The development of regional social and economic system depends on many factors,

which are characterized by such features:

- complexity which means that the development of the system is affected by the combination of all factors;
- independence caused by natural factors, expressing the conditions of the existence of any life;
- the priority of the factors that determines a dominant role of one or more factors in development.

There are many different classifications of factors of region innovative development. The factors are divided into three groups: climatic, production and economic, social and cultural.

New conditions of regions functioning which are associated with the processes of economic globalization, the implementation of scientific and technological progress, the influence of factors of sustainable development dictate the necessity of management quality improving of their socio-economic development. However, there is no complete and consistent approach to ensuring the quality of territory

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<sup>1</sup> Corresponding author: Olga Soboleva  
email: [olsia-soboleva@bk.ru](mailto:olsia-soboleva@bk.ru)

governance in regional systems. Also the territorial methods of quality management are poorly used.

## 2. Problem statement

In the Constitution of the Russian Federation the main objectives of territorial management are the identification, effective usage and development of main sources of improving the quality of population's life and on the other hand, the protection of these territories and the population from possible threats.

As the theory of management determines and the practice confirms, ineffective management of the territories which does not ensure the achievement of goals is characterized by lack of validity and (or) late formation and decision-making, bringing them to the performers, low executive discipline due to the lack of permanent and full control of execution of the taken decisions and given instructions.

There are three most common approaches to the organization of territory development management systems. Firstly it is the usage of specific separates solutions aimed at property management or management of municipal facilities, various register system in a single region or municipality. Secondly, it means creation of a system, for example, geographic information system when one core is combined with all the necessary information. Thirdly, it is integration solution that unifies existing developments, leads them to the same standard, avoids duplication, provides tools for both performers and those people who make management decisions.

Quality assessing of territory governance is a complex process. So it is not enough to use only methods of quality assessing of territorial authorities' activity, as the regions differ in the level of economic development and potential. Insufficient knowledge of this issue puts the task to develop a methodology of assessment of regulatory impact quality

through the key factors of economic development based on discriminant and factor analysis.

## 3. Description of investigation

The modern concept of economic system management in different levels (country, region, municipality, enterprise) is the concept of strategic management. It arose as a response to the challenges and threats of the external environment, such as increasing instability, growing globalization, aggravation and a fundamental change in competition. Traditionally strategic management considers in relation to commercial organizations, however, today's realities show that no region can develop without its own strategy. Development and implementation of the strategy can significantly improve the level of region's development and ensure its competitiveness and investment attractiveness. The widespread use of strategic management methods at the regional level is becoming a necessity.

In recent years many special studies, mostly foreign, have been devoted to theoretical and methodological aspects of regional strategic management. Some authors (Ansoff, 2007; McDonald, 2006; McConnell and Brew, 2002; Mintzberg, Quinn & Ghoshal, 1995; Porter, 1998; Samuelson and Nordhaus, 2001; Thompson and Strickland, 2003; Fischer, Dornbusch and Schmalensee, 1999) have made the significant contribution to formation and development of this section of management science.

Strategic management for the Russian economy is a rather new phenomenon. Some Russian scientists (Aganbegyan, 2003; Gaponenko, 1999; Granberg, 2003; Nikolaev, 2000; Pilipenko, 2004; Tatarin, 2004; Shekhovtseva, 2007) have devoted their studies to the problem of regional strategic management. In their works selected theoretical and practical aspects of strategic management of enterprises are

revealed. However, the aspects of strategic management of a region as an economic system are not disclosed. An exception are the works of A. Gaponenko, which sets out a number of methodological problems, however, many issues require further research.

The works by other Russian scientists (Burtsev, 2006; Openyshev and Zhukov, 1999; Titov, 2006; Salikhov, 2006; Sineva, 2006; Stepashin and Shokhin, 2004) are devoted to the problems of establishment of effective state control system, including budget, development and improvement of its efficiency.

Theoretical and practical aspects of functioning of budgetary system at the regional and local levels, as well as different methods of improving state control in the regions are presented in monographs and articles (Agapova, 2001; Ignatyeva, 2003; Krokhnina, 2002; Lagutin, 2010).

All existed approaches to the assessment of the level of the territory effective development can be divided into two large groups: the analysis of background and analysis of results (Trifonov *et al.*, 2013).

The development of regional socio-economic system depends on many factors, which are characterized by such features as:

- complexity, which means that the system development is affected by the combination of all factors;
- independence caused by natural factors, expressing the conditions of the existence of any life;
- priority of factors acting which determines the dominant role of one or more factors of development.

The quality of territory management is determined by the efficiency of regional management. Currently, the evaluation of the effectiveness of the regional governance system is based on usage of indicative and criteria approaches. Over the last decade a variety of systems and methods of evaluating the effectiveness of management was developed.

In modern conditions the main task of the regions and territorial and economic subsystems is to ensure not only sustainable development but also to manage innovatively this process taking into account the special characteristics of their social economic status (Nikulina, 2014).

Consequently, management of innovative activity in Russia is carried out at four levels: federal, regional, municipal and individual enterprises. Thus, the management of innovation processes at the federal level involves determining the goals and objectives of innovative economic development of the Russian Federation and instruments of state regulation and support of innovative enterprises and creating a favourable innovation environment. In 2010 in Russia the strategy "Innovative Russia-2020" was developed. It identifies the key target indicators and development priorities of the regions in the country.

At present an innovative climate is one of the key issues of social and economic development of the regions of Russia. The regions of Russia are characterized by the uneven development of different aspects of innovation processes and the factors influencing them. They show considerable diversity in this aspect.

In the Russian economic literature there are different methodological approaches (simple and complex) to the estimation of innovative potential of the territory.

Some authors (Gritsenko & Shubin, 2015) consider that there are three groups of methods for investigating territories' innovative potential: the index indicator methods, scoring methods, matrix methods.

The first group of methods is associated with estimation of variable values interpreting quantitative and qualitative characteristics of innovation processes. The second group includes methods score (rating) evaluation the essence of which is reduced to determining the coefficients of importance (weight) of total and partial indicators of innovative potential of the region on the

basis of expert assessments. In the third group the authors include matrix methods which enable to estimate the quantitative proportions between the various elements of innovative capacity in the context of types of economic activity.

All the proposed methods do not provide a full integrated assessment of innovative activity of regions and give an estimate based on the usage of separate indicators.

The Institute for statistical studies and Economics of knowledge and the Higher School of Economics (Russia) is conducting analysis of innovative development of the Russian regions which is based on a system of indicators characterizing social and economic conditions of innovative activity, scientific and technical potential, level of innovative activity, the quality of regional innovative policy of the developed complex. The result is a ranking of innovative development of subjects of the Russian Federation which is formed of 4 sub-indices:

- 1) the index of social and economic conditions of innovative activity;
- 2) the index of scientific and technical potential;
- 3) the index of innovative activity;
- 4) the index of quality of innovation policy.

The parameters used are in line with Russian and international statistical standards; applying methodological approaches are in line with the practice of creating a regional innovation index and the development of appropriate ratings under the auspices of the European Commission and other international organizations.

Three of the four sub-indices allow fulfilling the assessment on the basis of data provided by Federal state statistics service of the Russian Federation, annual reports of the Federal Treasury on execution of budgets of subjects of the Russian Federation and local budgets with digital values. The fourth unit is connected with the assessment of the normative legal base for innovation policy, organizational support of innovation policy,

which is assessed by the presence of the strategies (concepts), territorial planning schemes, the specialized legislative acts defining the measures of innovation support in the region, the presence of specialized coordinating bodies of innovation policy.

The presence of these estimation indicators cannot objectively reflect the innovative development of the regions.

The implementation of the regional strategy establishes the targets of the social and economic development of the region. The achievement of planned targets reflects the effectiveness of activities of the regional strategy. The application of coefficient method will allow you to assess the effectiveness by comparing the planned and actual values.

$$K_{\Phi i} = \frac{N_{\Phi}}{N_{\text{пл}}} \tag{1}$$

$N_{\Phi}$  – actual value

$N_{\text{пл}}$  – planned value

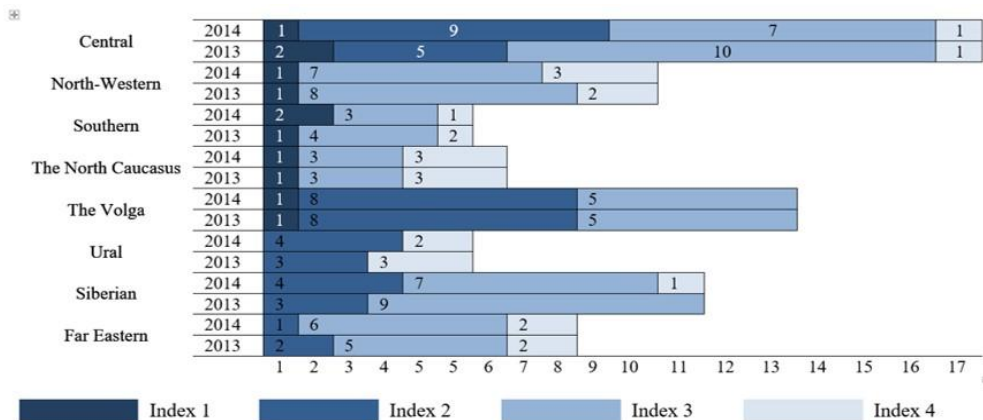
When  $K_{\Phi i} > 1$  the activities of the regional strategy are implemented effectively.

When  $K_{\Phi i} < 1$  the activities of the regional strategy are not implemented effectively.

Now we can determine the maximum value ( $K_{\Phi i}$ ) of the leader region which is taken as 100%. Further, the corresponding parameters of other regions are calculated regarding the leader.

$$R_i = \frac{K_{\Phi i}}{K^{max}} \cdot 100\% \tag{2}$$

On the basis of the obtained results the rating of innovative activity of regions is created.



**Figure 1.** Distribution of regions with different levels of innovation development according to the Federal districts

By the end of 2014 the North-Western Federal district became the leader region with the amount 9%; it is followed by the Volga district (7%) and the Central Federal district (6%). In other Federal districts the regions of the first group are not presented (Figure 1).

In the Central Federal district the number of regions from the second group was significantly increased (five to nine). As in the past year there were no regions from the second group in the North-West Federal district. The Volga Federal district lost leadership in total share of regions in the first and second groups. The Ural Federal district became a leader.

Generally the regions of the second and third groups were distributed more evenly. The second group includes more than half of the regions of the Ural and the Volga Federal districts, 50% of the Central and more than third part of the Siberian and the Southern.

In the North-Western, the Siberian and the Far Eastern Federal districts there were more than 50% of representatives of the third group, in the Southern – exactly 50%. Regions of the fourth group clearly dominate in the North Caucasus Federal district (43%). Portion of regions of the third and fourth groups in the North-Western Federal district is 91%, in the Far Eastern – 89%, in the

North Caucasus – 86%. In the Volga and the Urals Federal districts the regions of the fourth group were not presented.

In 2014, the distribution of the regions remained unchanged in the North Caucasus and the Volga Federal districts.

As the main actors of the innovation market in the Russian Federation are the organizations of various legal forms, types of ownership, sector and size, performing research and development. The number of organizations performing research and development in the Russian Federation for the period from 2009 till 2014 slightly increased and in 2014 it was 3 622 (which is 2.5% more than in 2009). The negative trend is the reduction of personnel which fulfill research works and development and a reduction of the portion of internal costs on research and development in the country's GNP.

Thus, we can conclude that the creation of new technologies and products is predominantly provided by economic entities whose activity is financed from the Federal budget funds; the private sector of the region is rarely interested in funding projects related to the creation of innovation.

The successful development of the territory is related with the strategy of innovative development of the region. We believe that it

is necessary to determine the factor of innovative development of the region while creating the methodology of quality assessment of territory governance.

On every stage of the innovation process there are some socio-economic and psychological factors that either inhibit or stimulate this process.

Most authors consider factors as "the innovation potential".

Innovative potential of the region is a part of the economic potential represented by research, constructive and technological organizations, pilot production, pilot development, by the staff of research organizations with their skills and abilities to unconventional and innovative ideas. The innovative capacity is the ability of different sectors of the economy to produce high-tech products met the requirements of the world market. Therefore, innovative potential is tied to a particular level of the economy – the national economy. Monastyrnyi E. A. believes that innovative capacity is the ability of a system to organize and manage processes to achieve results that most closely match changes in the external environment,

primarily changes in market demands (Monastyrnyi, 2008).

A. I. Prigozhin distinguishes the various causes of resistance to changes (Prigozhin, 2003):

- economic (low-cost labour and the lack of correlation between incomes and quality of work);
- social (inertia of the organization);
- psychological (the lack of motivation in achievements, effects of "not invented here" and "it's easier to buy abroad").

Effective management of innovation process is connected with the development of socio-economic system. It implies the condition of a system when there are necessary factors for progressive development, for maintaining internal and external balance, for ensuring gradual transition from simple phenomena to the more complex. Let's consider the basic indicators describing demographic, natural resources, economic, social, environmental and infrastructural factors determining development of a region (Table 1).

**Table 1.** Factors of social and economical development of a region

Factors	Indicators
Demographic	The rate of population growth, life expectancy, population structure, employment rates, volumes and dynamics of migration flows
Natural resources	Climatic conditions, natural resources (energy, mineral, water, biological resources), economic and geographical position of a socio-economic system
Economic	The volume and structure of production, the investment potential of the socio-economic system, financial viability, fiscal capacity, innovation receptivity, the profitability of enterprises of a socio-economic system
Social	The standard of live, indicators of social security in a socio-economic system, cultural and educational potential, indicators of quality of life
Environmental	Indicators of environmental contamination, cost of environmental protection, implementation of environmental technologies
Infrastructural	Indicators of development of production, social and market infrastructure

Despite all the diversity of Russian regions it is necessary to highlight some common and important factors and conditions that influence on the possibility of region's transition to sustainable and innovative development.

For innovative development of the region within the framework of political and legal factors the state regulation of socio-economic processes should be carried out by the means of regulatory framework development. The availability of natural

resources in the region, the extent of its territory and peculiarities of its geographical position characterize the conditions of sustainable ecological-economic interactions. Innovation and technological factor reflects the presence of high-tech products and well-functioning regional innovation system as a mechanism for the implementation of innovative and sustainable economy which will ensure the effective modernization of industry and implementation of effective technologies. Financial and economic factor contributes region's effective system of financial and economic instruments of regulation and achievement of innovation process objectives.

An important aspect of managing any economic system is the availability of tools for assessment of the main indicators of the system development and the results achieved the possibility of comparing them with other subjects, as well as the possibility of constant control over the dynamics and directions of changes within key indicators of development.

Nowadays there are no coherent and generally accepted (universal) methods of assessment. Among traditional methods there is the method of factor analysis as a type of mathematical analysis of several variables functions, which allows determining the impact of different variables on the function.

In the economic analysis for assessing the factor influence a number of methods are traditionally used.

The method of finding the total differential of many variables function is based on the differential method of determination of changing factors impact on result indicator changing. It should be noted that the differential accuracy of the method strongly depends on magnitude of change of influencing factors. The smaller is the increment of factors, the higher is the accuracy of the estimation of factors influence on the resulting index. The main

drawback of applying the method of differential calculation is that it is usually requires an exact balance of changes in the result indicator and an algebraic sum of influence of all factors.

The index method is suitable when the number of factors is two (one of them is quantitative and the other is qualitative) and the indicator is equal to their product, so the index method doesn't provide a common approach for the factor decomposition of the increment of the result indicator for the number of factors more than two.

The method of chain productions is characterized by the fact that base values of indicators are replaced by the actual while consistent using of the technique of elimination for all factors.

Despite the fact that this method is the most promising, its application was objected by a number of economists over a specific abstract reasoning, practical solution of the problem mainly in mathematical terms.

The method of absolute differences is a modification of the elimination, but is only applied to multiplicative and mixed multiplicative-additive models. In addition to the inability to use this algorithm for all types of factor systems the method of absolute differences has the same drawbacks as the method of chain substitutions.

The method of relative differences is a modification of the method of absolute differences. It is also applied only to multiplicative and multiplicative-additive models. The disadvantages of the method are the same as the whole of this class, and the main one is the variation of the results depending on changes of the order of factors consideration. The reason of this drawback is that the differential is equal to the increment of the function only in the case of infinitely small quantities.

The method of irreducible residue simple adding is linked to the condition of determining quantitative and qualitative factors which complicates the task when using the factor systems of large dimension.

The decomposition of the total deviation of the resulting index again depends on sequence substitutions. In this case it is impossible to obtain unambiguous quantitative data of the effects of individual factors without complying with the additional conditions.

The method of weighted finite differences allows considering all the options of substitutions. However, this method is highly labour intensive and offers quite a computationally intensive procedure, as all possible permutations must be cycled.

The method of weighted coefficients uses the principle of elimination fixing the resulting indicator on the base level for all factors, except for the estimated.

In some cases, to determine the amount of factors influence on the deviation of the result indicator the equity method may be used. This method is used for additive and multiple models.

The logarithmic method is that logarithmically proportionate balance is achieved between the factors. It does not require prioritization of factors. The main disadvantage of the logarithmic method is that it cannot be "universal" because its application is difficult in the analysis of more complex models of factor systems.

A modification of the method of differential calculation is the method of crushing of increments of factorial signs when the increment of each of variables is crushed on small sections and recalculation of partial derivatives at each (already enough small) moving to space is done. The degree of fragmentation is that the total error does not influence on the accuracy of economic calculations.

A logical further development of the method of crushing of factorial signs increments which develops the method of differential calculation was the integral method of factor analysis. This method is based on the summation of the increments of the function defined as partial derivative multiplied on the increment of the corresponding

arguments on infinitely small intervals.

The disadvantages of the integral method include the difficulties connected with obtaining the formulas for calculating the factor influence for an arbitrary model.

Thus, the construction of the auxiliary functions and their subsequent integration becomes quite complex and individual process for each specific model, as it depends on the type of function analyzed and the numerical methods used in the calculation of the definite integral can significantly affect the accuracy of the final result.

The next traditional method of investigating factors influence on innovative activity of economic system's subjects is discriminant analysis. Discriminant analysis is a branch of multivariate statistical analysis that allows to study differences between two or more groups of objects on multiple variables simultaneously. Discriminant analysis is a general term referring to several closely related statistical procedures. These procedures can be divided into methods of interpretation of intergroup differences (discrimination) and methods of classification of observations in groups.

Like many other multivariate methods discriminant analysis is based on the construction of linear combinations of attributes (functions) with a specific coefficient (contribution). In discriminant analysis linear combinations are called discriminant functions:

$$DF = b_1x_1 + \dots + b_ix_i + \dots + b_px_p + C$$

DF – the value of the discriminant function

$x_i$  – the numerical value of the  $i$ -th attribute

$b_i$  – the contribution of the  $i$ -th attribute in the value of the function

$p$  – the number of attributes

$C$  – the constant

Discriminant analysis provides an objective comparison (split) groups due to the artificial minimization of intra-group diversity (dispersion).



Like all statistical methods discriminant analysis is associated with a number of limiting assumptions:

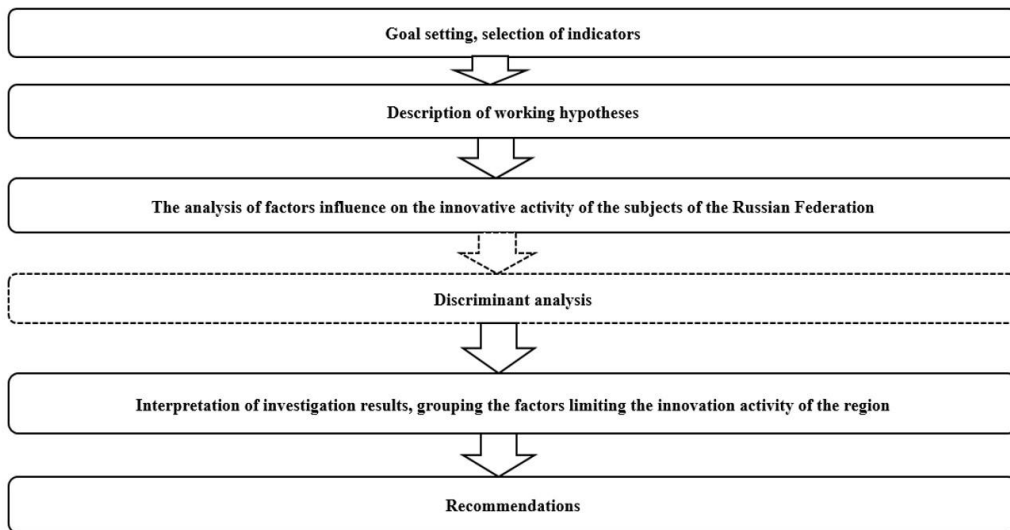
- the predictors should be measured in a numerical scale - interval or relative. Practice shows that the method can also work with ordinal variables, but the number of gradations should not be too small (at least 5);
- each class should be corresponded with the multivariate normal distribution. When using the method for solving practical problems this assumption is often violated especially when the large volumes of samples are used. It can lead to inaccurate estimates of significances and probabilities of belonging to classes. But as practice shows if the classes are quite well separable, it has no effect on the working decision rule;
- the covariance matrix in different classes should be equal. When this assumption is violated the linear split is not too comfortable. In this case quadratic discriminators are

more suitable. But if the difference of covariance matrixes is not too large and amount of samples is small the linear function approximates decision well.

Violation of the limiting assumptions increases the error of the optimal decision rule, therefore, in this case it is necessary:

- to have a volume of samples that in 10-20 times greater than the number of predictors;
- the number of objects of each class must exceed the number of predictors (not less than 5 times);
- the end model, as a rule, should not include more than 10 predictors;
- to conduct additional research of outliers which can negatively affect the result. It is possible to conduct analysis with the exception of outliers.
- to take into account cases when two variables are strongly correlated, although the quality of the decision rule is usually not impaired.

Discriminant analysis makes it possible to understand in which variables the existing classes (segments, etc.) differ most of all.



**Figure 2.** The technique of determining factors of the region development (authoring)

Each respondent is attributed to the probability of getting in one or another class. Thus, during segmentation you can define the main (highest probability) and secondary (second largest probability value) segment of a respondent.

The method allows reproducing the existing segmentation, extending it to new waves of research. In addition, it can be used to assess the stability of the segments.

Finally, with the help of discriminant analysis it is possible to create different maps, greatly facilitating interpretation of results of the cluster analysis.

Our technology of determining factors of region development (Figure 2) will allow identifying the factors which determine region development. It allows selecting indicators for assessment of territory governance quality.

#### 4. Investigation results

Our investigation was devoted to determination which factors have the greatest impact on the innovative activity of subjects of the Russian Federation. To solve this problem we used discriminant analysis. The data was obtained in 73 subjects of the Russian Federation.

On the first stage the problem was stated by defining objectives, independent and dependent variables. The dependent variable should consist of two or more mutually exclusive and mutually exhaustive categories. If the dependent variable is measured by interval or relative scales it should be converted into the status of categorical. The sample of subjects of the Russian Federation was examined with such variables as:

- innovative activity (VAR1);
- gross regional product per capita (VAR2);
- the portion of expenditure on technological innovations in total volume of shipped goods, performed works, services (VAR3);

- the number of enterprises, organizations (VAR4);
- the structure of the gross regional product by types of activities (VAR5);
- the ratio of profitable organizations percentage of total organizations (VAR6);
- type of the region (VAR7);
- usage of advanced production technologies (VAR8);
- the rating of investment attractiveness of regions (VAR9);
- the average income of the population (VAR10);
- the portion of domestic expenditure on research and development in the gross regional product (VAR11);
- the unemployment rate (VAR12).

Analysis of the combined intra-group correlation matrix allows us to select values which are closely interlinked. Their value exceeds the standard 0.5.

In our research these values are "gross regional product per capita" and "the average income of the population" as their correlation coefficient amounted to 0,734, "usage of advanced production technologies" and "number of enterprises" with a correlation coefficient of 0.732, "gross regional product per capita" and "the rating of investment attractiveness of regions" - 0,601, "number of enterprises" and "type of region" - 0,670, "type of region" and "usage of advanced production technologies" - 0,592, "usage of advanced production technologies" and "the portion of domestic expenditure on research and development in the gross regional product" - 0,612, "the rating of investment attractiveness of regions" and "the average income of the population" - 0,630.

Other predictors are not connected, because their coefficient is less than normative value.

**Table 2.** The results of discriminant analysis of two groups

VAR1	VAR2	VAR3	VAR4	VAR5	VAR6	VAR7	VAR8	VAR9	VAR10	VAR11	VAR12
1	338,96	3,2903	58590,7	2,4839	68,932	2,225	2952,3	4,2258	36217	1,1197	5,4129
2	282,103	1,5452	43221,76	2,8810	66,8238	2,4762	2292,92	5,2857	31398,5	0,6107	6,5310
Total	306,249	2,2863	49748,3	2,7123	67,7192	2,3699	2572,95	4,8356	33444,8	0,8268	6,0562
The standard deviation in the groups											
1	217,313	2,19079	67174,61	1,71018	5,70855	0,8045	2761,01	1,43084	11795,7	1,07580	1,8550
2	205,373	1,48672	42831,25	1,74191	5,57187	0,7067	2929,78	1,83842	8112,39	0,75873	2,2233
Total	210,941	2,00321	54620,01	1,72787	5,68843	0,7547	2858,66	1,74812	10059,9	0,9349	2,1350
The combined intra-group correlation matrix											
	VAR2	VAR3	VAR4	VAR5	VAR6	VAR7	VAR8	VAR9	VAR10	VAR11	VAR12
VAR2	1,000	0,061	0,091	-0,236	-0,146	-0,291	0,145	-0,611	0,734	-0,031	-0,172
VAR3	0,061	1,000	0,293	-0,058	0,224	0,264	0,322	-0,098	-0,046	0,240	-0,130
VAR4	0,091	0,293	1,000	-0,058	0,273	-0,670	0,732	-0,422	0,244	0,569	-0,325
VAR5	-0,236	-0,058	-0,058	1,000	0,167	0,076	-0,75	0,063	0,007	-0,017	0,170
VAR6	-0,146	0,224	0,273	0,167	1,000	0,076	0,289	0,047	-0,257	0,085	0,033
VAR7	-0,291	0,264	-0,670	0,076	0,076	1,000	-0,592	0,61	-0,266	-0,274	0,265
VAR8	0,145	0,322	0,732	-0,075	0,289	-0,592	1,000	0,395	0,199	0,612	-0,434
VAR9	-0,611	-0,098	-0,422	-0,063	0,047	0,601	-0,395	1,000	-0,630	-0,270	0,511
VAR10	0,734	-0,046	0,244	0,007	-0,257	-0,266	0,199	-0,630	1,000	0,139	-0,158
VAR11	-0,031	0,240	0,569	-0,017	0,085	-0,274	0,612	-0,270	0,139	1,000	-0,339
VAR12	-0,172	-0,130	-0,325	0,170	0,033	0,265	-0,434	0,511	-0,158	-0,339	1,000

**Table 3.** The significance of discriminant function

Function	Value	% of variation	Canonical correlation	After function	One-repetition maximum	Chisquare	Degree of freedom	Statistical significance
1	0,562	100,0	0,600	0	0,640	29,215	11	0,002
Coefficient $\lambda$					F	Statistical significance		$F_{\text{крит.}}$
	VAR2		0,982		1,301	0,258		
	VAR3		0,812		16,437	0,001		
	VAR4		0,980		1,420	0,237		
	VAR5		0,987		0,941	0,335		
	VAR6		0,966		2,501	0,118		
	VAR7		0,973		1,990	0,163		
	VAR8		0,987		0,948	0,333		
	VAR9		0,909		7,113	0,009		
	VAR10		0,943		4,279	0,042		
	VAR11		0,927		5,624	0,020		
	VAR12		0,932		5,175	0,026		

The significance of F-statistics indicates that when the predictors are considered individually only "gross regional product per capita" and "the average income of the population", "usage of advanced production technologies" and "number of enterprises" significantly differ in different subjects of the Russian Federation, with high innovation activity and low innovation activity.

When testing the significance of discriminant function in our research we revealed that one-repetition maximum 0,600 was converted in Chi-square statistics equal 29,215 with 11 degrees of freedom. The significance amounted to 0.001 which indicates a high significance of averages difference, i.e. statistical reliability and validity of the results.

For discrimination between groups the most important predictor is the "the average income of the population" (0,797), followed by "the the portion of expenditure on technological innovations in total volume of shipped goods, performed works, services"

(0,696). A similar observation was obtained from inspection of the structural correlations. Thus, for the subjects of the Russian Federation it is reasonable to create profiles of the two groups from the point of view of the two predictors that seem the most important. They are "the average income of the population" and "the the portion of expenditure on technological innovations in total volume of shipped goods, performed works, services".

We summarized elements lying on the diagonal of the matrix and divided the total by the total number of cases. So we determined the success rate or percentage of correctly classified cases. In our example, the success rate is equal to  $(23+32) / 73 = 0.75$  or 75%.

The studied group of innovation-active regions consists of 23 subject of the Russian Federation out of 31. There are 32 not innovation-active out of 42. The correct classification results amounted to 74.2%, and incorrect to 25.8%.

**Table 4.** The results of canonical discrimination

The coefficients of the canonical discriminant function		Structural matrix	Standardized coefficients of canonical discriminant function	Canonical discriminant functions evaluated at centroids	
VAR	Coefficient	Structural	Standardized	Group	Function
VAR2	-0,554	0,642	-0,003	1	0,861
VAR3	0,696	-0,422	0,383	2	-0,635
VAR4	-0,310	0,375	0,001		
VAR5	-0,288	-0,360	-0,167		
VAR6	0,499	0,327	0,089		
VAR7	-0,024	0,250	-0,033		
VAR8	-0,567	-0,223	0,001		
VAR9	-0,296	0,189	-0,176		
VAR10	0,797	0,181	0,001		
VAR11	0,380	0,154	0,419		
VAR12	-0,266	-0,154	-0,128		
The percentage of correctly classified group cases – 75%					

The investigated group of not innovation-active subjects consists essentially of 32

subjects, 10 were included in the group of innovation-active subjects by mistake. So the

correct classification amounted to 76.2%, incorrect - 23.8%. It indicates high reliability of the results.

## 5. Conclusions

Thus, the interpretation of the results allowed us to draw the following conclusions that 31 subjects of the Russian Federation out of researched 73 (42%) is innovation-active. The portion of expenditure on technological innovation amounted to 3.2%. It is lower than the national average amounting to 10.3%, and in the European countries from 7% in Slovakia and 74% in Luxembourg. Also the main activity in the gross regional product is mining. The portion of expenditure on research and development in gross regional product is 1.1%.

A methodology proposed for assessing the quality of regulatory impact through the key factors of economic development on the base of discriminant and factor analysis allows identifying the factors influencing the quality of territory governance:

- gross regional product per capita;
- the average incomes of the population;
- usage of advanced production technologies;
- the portion of domestic expenditure on research and development in the gross regional product;
- the rating of investment attractiveness of regions.

To develop innovative activity of regions of the Russian Federation regional governments should attract investment resources in the industries capable to change the structure of gross regional product.

Due to the reduction in funding for innovation activities from the budget companies are forced to seek extra-budgetary sources of financing which leads to the commercial nature of research results.

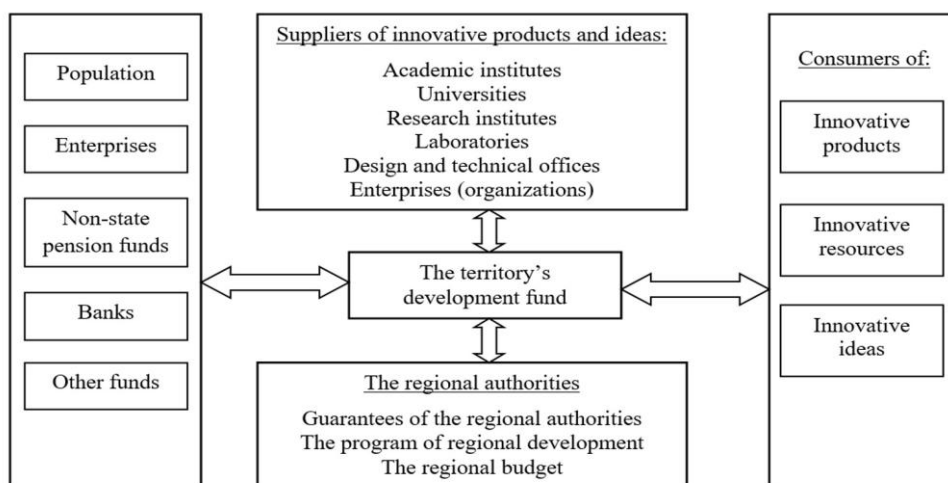
Lately in the practice funds in the status of a state corporation and found in fact play an important role in public management of priority national projects and regional development.

We have proposed a financial instrument of fund supporting innovation in the region (Figure 3). It can act as a separate legal entity and separate economic entity using its available financial, material and technical resources. It can receive revenues from its commercial activities and carry a full economic and legal responsibility to the partners in accordance with the current legislation of the Russian Federation.

On the one hand there are the investors who invest free funds to the territory's development fund; on the other hand there are consumers of investment resources of the fund.

In addition to financial investments, academic institutions, universities, research institutes, laboratories, design and technological offices, enterprises (organizations) as suppliers of innovative products and ideas can invest in the form of products and ideas.

It is assumed that the selection of investment projects will be carried out on the basis of indicators of financial, budgetary, economic and social efficiency of the projects. It allows us to estimate the contribution of the projects to the improvement of the most important indicators of social and economic development of the country and its regions: the growth of gross domestic (regional) product, additional revenues to the budget system of the Russian Federation, increasing the level of employment of the population, increasing the availability and quality of services to the population. Fund projects will be selected under the public procedure provided their consideration at the Investment Commission on selection of projects applying for the fund.



**Figure 3.** Financial instrument of fund supporting innovation in the region

According to the Charter the main purpose of the territory's development fund is to promote the implementation of regional policy in the sphere of scientific, technical and innovation activities. To do this the fund provides organizations with financial and advisory support in the implementation of scientific and technical projects and experimental works, including activities in the framework of regional scientific and technical cooperation. The fund coordinates the implementation of particularly important and integration projects with the participation of medium and large private

businesses, professional groups of innovators and small innovative enterprises within the technological platforms. In the framework of its activities the fund organizes scientific, technical, legal, financial and economic expertise of scientific and technical projects and experimental works and funding promising scientific researches on the basis of loans. The fund interacts with educational institutions supporting their participation in the implementation of scientific and technical projects and efforts to improve training programs.

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**Olga Soboleva**

Vyatka State University,  
Faculty of management and  
service  
Russia  
[olsia-soboleva@bk.ru](mailto:olsia-soboleva@bk.ru)

**Olga Nogovitsina**

Vyatka State University,  
Department of state and  
municipal governance  
Russia  
[nogovitsina@vyatsu.ru](mailto:nogovitsina@vyatsu.ru)

**Elena Syrtsova**

Vyatka State University,  
Institute of continuing  
education for Russian and  
foreign citizens  
Russia  
[elenasyrtsova@list.ru](mailto:elenasyrtsova@list.ru)

**Olga Tokmakova**

Vyatka State University,  
Department of e-learning  
Russia  
[o.tokmakova@gmail.com](mailto:o.tokmakova@gmail.com)

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