Development Of Methods For Assessing The Investment Attractiveness Of The Regional System.

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ABSTRACT

In conditions of institutional transformation it is difficult to overestimate the role of economic research for the development of the market system and the formation of a socially sustainable society. This is especially important in the financial environment, the correct vector of development of which provides economic growth of any regional system. In this regard, there is a need to expand the methods of assessing the attraction of financial resources and analysis of the investment potential of the local system. Any economic system is a complex mechanism, formed under the influence of a large number of factors. And the appropriateness of the final evaluation depends on the correctness of the choice of this or that criterion. However, in order to build the right model for the optimal development of the economic system, an analysis of a large number of indicators is required, which would allow an assessment of the current situation and propose alternative solutions. The paper proposes the formation of a methodological approach to assess the investment attractiveness of the economic system. The basis is the method of cluster analysis and the determination of the factor factor by selecting the effective criteria of the greatest significant load. Ranking of subjects of the Russian Federation according to the level of investment potential was made, recommendations on increasing the interest of external investors to the regional system were developed.
eywords: methods, factor analysis, investment attractiveness, economic system.

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INTRODUCTION

The analysis of the literature sources made it possible to identify several approaches to information support of economic systems, however, in our opinion, they have a narrow focus and this problem is still at the stage of the study. Problems of application of methods and tools of information support were considered in the works by domestic and foreign scientists and specialists, among them A.A. Alborov. [1], Belov V.S., Kosheev A.D. [1], Kutin A.A., Dolgov V.A., Ivanova A.Yu., V.A. Milkin., Norton D., Stern S, D. Ronfeld. and others A.Yu. Ivanova explores the problem of information and analytical support, points out that different versions of the information field should be developed for different categories of users and differentiated targets for analysis [3, p. 17]. A number of authors consider the information support system in the context of the possibility of using computer technology. Thus, V.S. Belov under information support means a set of hardware, software, information resources, techniques that serve to automate analytical work in order to justify the adoption of managerial decisions [2, 10]. In general, we support the author's opinion that it is not enough simply to gather information, it is also necessary to properly process it to obtain adequate results. A.A. Kutin, V.A. Dolgov and V.A. Milkin in the process of building information support to assess the production potential divided the process into three stages and for each stage built their own information model. In general, as the general world practice shows, there is still no single approach to the mechanism of information support of economic systems, which makes the selected study very relevant.

MATERIALS AND METHODS

As the directions of increasing information support, the construction of a system of methods for satisfying users with the aim of making strategic important decisions have been chosen. In this regard, the main goal of our work is to develop a mechanism for studying economic systems by identifying the most significant factors of their development on the basis of a cluster approach, which will provide the most complete information about the process under investigation. For example, we have chosen an assessment of investment attractiveness and the construction of a research model.

The key moment in the realization of this goal is the formation of a network of clusters. We propose its following scheme (Figure 1).
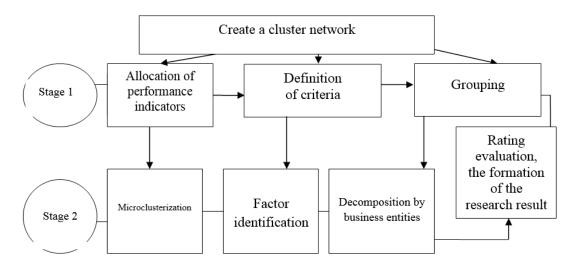

Figure 1: Forming a network of microclusters assessing investment attractiveness at the regional level

As you can see, the technique of cluster network formation includes 2 stages. At 1 stage within a certain territory (region or country) a group of indicators is determined, the most significant criteria with the greatest factor load are allocated, and the information load of which in the development of this or that branch would bring greater economic efficiency, and at the second stage within certain regions microclusters, directly economic entities in which the development of an industry on an industrial scale brought the maximum economic return.

The approbation of this technique was carried out on the materials of the Russian Federation for the period 2010-2016 g using the software product STATISTICA 10.0.

The result of the first stage was the identification of a group of factors, the determination of the performance indicators that have the greatest impact on the development of the economic system.

At the second stage, the meso-cluster typology of the districts was carried out, taking into account the prevailing factors for the concentration of investments.

Based on the above data, we conducted a grouping of regional systems in terms of investment potential. A system of quantitative characteristics has been developed that satisfies the following conditions:

- proportionality, indicators should be brought to a single database;
- informative accessibility;
- consistency, i.e. the inadmissibility of a situation where the same criterion characterizes the various aspects of the phenomenon under investigation.

The following indicators were chosen as the base for the study: an average number of employees per year; per capita income; GDP; the cost of OPF and OF; the share of agriculture in GDP; indicators of the financial result; the value of trade turnover.

RESULTS AND DISCUSSION

The grouping of regional systems was carried out on the basis of a cluster analysis based on the Euclidean distance metric between objects, which can be expressed in the following formula:

$$d_e\left(X_i, X_j\right) = \left(x_k - x_{jk}\right)^{2}{}^{1|2} \tag{1}$$

$d_e\left(X_i - X_j\right)$ - distance between measurement vectors.

Integration into clusters occurred on the basis of the choice of the minimum distance between the included objects represented in the multidimensional space defining their characteristics.

To obtain reliable information on the basis of the cluster approach, preliminary calculations were carried out to normalize the indicators used, the elements of which are determined by the following:

$$\Sigma ij = \frac{y_{ij} - \bar{y}_i}{d_i}, \tag{2}$$

$\bar{y}_i$ - mean value of the indicator Yi;

standard deviation of the indicator Y_i:

$$d_i = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(y_{ij} - \bar{y}_i)^2} \tag{3}$$

Preliminary statistical assessment of the average standardized indicators allowed to identify regions with the maximum investment potential, with a constant growth for the entire period of study parameters: Moscow; Arkhangelsk, Leningrad, Moscow Region; Krasnoyarsk and Krasnodar Territory, Rostov, Volgograd, Voronezh Regions; St. Petersburg, Bashkortostan, Tatarstan. This group represents the first cluster. The results of graphically averaged group values are shown in Figure 1. Cluster analysis, by the remaining groups, made it possible to divide the entire set of objects into three clusters: high potential (1 cluster), medium cluster (2 cluster) and low (3 cluster).

In the second, the following regions were stable: Belgorod, Irkutsk, Murmansk, Samara, Sverdlovsk, Tyumen, Kemerovo, Novosibirsk, Vologda; the Republic of Komi, Sakha; Perm, the Altai Territory.

Dispersion analysis made it possible to show a fairly accurate affiliation of the objects to the cluster, as evidenced by the values of the intergroup and intragroup variances given in Table 1.

Table 1: Result of the variance analysis

Variable	Analysis of Variance (Cars)					
	Between SS	df	(Within SS)	df	F	signif.p
X1	72,18874	2	13,81126	84	219,5258	0,000001
X2	21,87904	2	24,12096	84	14,3310	0,000004
X3	65,68217	2	20,31783	84	135,7749	0,000000
X4	42,27830	2	34,72170	84	40,6134	0,000000
X5	34,55414	2	1,44586	84	28,2097	0,000001
X6	44,66010	2	12,33990	84	45,3732	0,000001
X7	80,06833	2	5,93167	84	566,9346	0,000076
X8	75,96078	2	10,03922	84	317,7891	0,000002

The smaller the value of intra-group dispersion (*Within SS*) and (*Between SS*) is greater than the value of inter-group dispersion, the more "qualitative" clustering is. Criteria F and p also determine the significance of the feature in the separation of objects into groupings. Optimal clustering corresponds to large values of the first indicator and less than the second criterion. Characteristics with the largest p values (which, for example, are greater than 0.05) must be excluded from the procedure.

CONCLUSION

Thus, the following conclusions can be drawn from the study. Regions that are part of the first cluster have a high investment potential. They have all the conditions for the formation of a stable economic climate, they are able to compete in the international market. For most regions of the second group, activities are needed to increase investment attractiveness. So, in the Belgorod region, the activity is based on the law "On Investments in the Belgorod Region", which provides tax incentives and guarantees for the implementation of socially and economically significant investment projects. For regions of the third cluster, one can recommend the creation of a coordinated system of measures in the legislative, taxation, and other sectors of the economy, to attract additional financial sources. The proposed mechanism of the investment sphere assumes such elements as providing guarantees for investors; an increase in the share of state support for investment projects, an information database of the investment market, etc. However, unfortunately, such a mechanism has not yet been created.

Thus, it is clear that the use of the proposed methodology will allow in the information field to provide a more objective assessment of the economic development of any system, which in future will serve as the basis for a more correct choice of the solution at the micro or macro level and will enable the determination of the most effective solutions.

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