Express assessment of the investment attractiveness and competitiveness of regional territories

Vladimir A. Polyakov

Doctor of Economics, Associate Professor
Tula branch of the Financial University, Tula, Russia
E-mail: VAPolyakov@fa.ru

Irina V. Fomicheva

Candidate of Economics, Associate Professor
Tula branch of the Financial University, Tula, Russia
E-mail: fiw712@mail.ru

Abstract. The article considers the problem of developing a methodology for express assessment of investment attractiveness of territories of a region in conditions of incomplete information about the indicators for assessing the territory or the complexity of their formalisation. We use the methodology based on an expert assessment of the macroeconomic factors of the region and their processing using the tools of the hierarchy analysis method by T. Saati. The study allows for a sufficiently reliable numerical assessment of the attractiveness of individual territories in the region and the construction of a scale of their priority. The study dwells on the steps involved in assessing the investment attractiveness of a site by means of hierarchy analysis and proposes the basic criteria for assessing the territories of the regions. It contains the examples of the construction of pairwise comparison matrices. The paper makes conclusions on the integral indicator data, and a competitiveness (priority) ranking scale of territories is constructed based on the objective set. The express methodology of assessing the investment attractiveness of the territory presented in the article allows to analyze and assess the factors of the territory, justify the decision-making in conditions of uncertainty of the assessing factors, develop an integrated indicator of competitiveness of the analyzed territories of the region, make a rating scale of their priority for the investment prospects and development plans of the territory.

Keywords: investment attractiveness, territory competitiveness, hierarchy method, pairwise relationship matrix, territory evaluation criteria, evaluation methodology, integral criterion, rating scale, polygon method, "ideal point" method, ranking method, linguistic evaluation scale.

JEL codes: C89; E29; O18; R15

For citation: Vladimir A. Polyakov & Irina V. Fomicheva (2022). Express assessment of the investment attractiveness and competitiveness of regional territories. *Journal of regional and international competitiveness*, 3(2), 24. https://doi.org/10.52957/27821927_2022_2_24

DOI: 10.52957/27821927_2022_2_24

Introduction

In order to develop the economy, regions intensify the fight for ratings of investment attractiveness (competitiveness) of their territory, as well as territories within the region. The issues of assessing the investment attractiveness or competitiveness of the region are researched well in the modern economic literature. There have been developed a lot of methods for quantitative assessing the competitiveness of the territory. Some methods use the major factor of territory attractiveness, while others try to identify many factors.

Substantiation for the choice of methodology depends on the objectives facing the investor, his strategic planning, the speed of assessment, the form of the result, etc. The mistakes of analysts of the economic development department of state institutions, as well as interested business structures in assessing the investment potential of the region, underestimation of the impact of various macroeconomic factors lead to under-received income in the implementation of the investment project.

The current methods of assessing the specific advantages of the territories of the region are not normative. Thus, changing of the decision-making approaches to the introduction of innovations due to digitalization

requires adaptation of existing methods to assess the attractiveness of the territories of the region.

The assessment of the attractiveness of the territories of the region is correlated with the quantitative indicator of the required investments can change the nature of the region social production, reveal the potential of the territory through structural shifts in its national economic complex, and ensure an innovative type of economic development. Each area of the region has many attractive places for investment. Due to the importance of directly depending on the amount of investment on the potential of the territory development, which is a function of the level of its investment attractiveness, the development of express assessment methods of investment attractiveness (competitiveness) of the territory for its preliminary analysis is relevant issue.

Methods

The investment attractiveness of the territory is considered by scientists as a set of regional factors of macro-, meso- and micro-level, contributing to the investment process (Barinov, 2017); different factors, depending on the goals of the investor (Valinurova, 2017); the forecast of ensuring returns with minimal risks (Glazyrin, 2014); investment potential and the level of non-profit investment risks (Narolina, 2009), etc. By the Law of the Russian Federation N 135-FZ (ed. from 05.10.2015) "On Protection of Competition" it is interpreted as the competitiveness of economic entities.

All of the definitions of the investment attractiveness of the territory contain the common issues: competitiveness, regional factors, return and investment risk. The reason is the serious investment in the region requires a thorough assessment of the investment attractiveness of its territory, consisting of many factors with unpredictable value of the final result.

The indicator of investment attractiveness of the territory characterizes the degree of its competitiveness in relation to other territories to attract labor, capital, innovation (Kosobutskaya & Ravuangirina, 2019). Therefore, along with the attractiveness of the territory, it is possible to specify the terms of analogues: competitiveness of the territory, the relative economic position in the region, the comparative success. Interpretation of definitions is appropriate to apply from the position of the main customer of the results of the assessment of the attractiveness of the territory. The major customers can be public authorities, municipalities, potential investors, evaluation structures of the labor market, capital, innovation, tourism, etc. Thus, "competitiveness" is a set of particularly valuable factors of great importance for the main customer.

The nowadays problem is not the absence or deficit of appropriate techniques (there are many), but their optimal selection. The papers by Panaseikin (2011), Litvinova (2013), Ataev (2015), Sandu (2016), Suglobov & Morozov (2016), Vologdin (2017), Petrov (2017), Trachenko & Dzhioev (2018), Ivanov & Sokolitsyn (2018), Polyakov, Fomicheva, Zhukov & Vasina (2018) on assessing of the competitiveness of the region are widely known. Rating of investment attractiveness of Russian regions is carried out by the National Rating Agency.

At the moment in Russia there is no unified so as the generally accepted methodology for assessing the investment attractiveness of territories of a region, distinguished by the ease of its use by both government agencies and investors, assessing potential investment objects, the reliability of the result. The currently used methods of assessing the attractiveness of the territory can be classified on the basis of economic and mathematical methods, correlation and regression analysis and known methods of expert analysis (Kosobutskaya & Ravuanzhinirina, 2019). In Russia, the methodology of the rating agency "Expert RA" refers to the basic method of assessing territories. The Institute for Advanced Studies (IAS) methodology (Nagaev & Vergetter, 1995) is the most well-known tool for assessing the attractiveness of a region abroad.

However, despite the profound level of elaboration of the issue of territorial assessment, it has not been sufficiently studied at the empirical level.

The methodologies do not completely consider social and economical changes of the region, especially under the Western sanctions. The reactions of potential investors to the impact of advertising and the prospects of a globalized economy have not been sufficiently identified. The article used the material of empirical studies of potential investors from the regions of central Russia.

Results

The paper proposes to consider the methodology of express-evaluation of investment attractiveness of

the territory of the region, based on scale of evaluation of hierarchies by T. Saaty (2014). The simplicity of this expert-analytical method includes the express-assessment of the impact of the factors of the attractiveness of the territory to the choice of a particular territory of the region to predict the possibility of investment in it. The hierarchy method is widely used in decision-making tasks, allowing it to be used quite effectively to select an attractive area for an investor out of a number of alternatives. In particular, to quickly calculate and select the most meaningful option for the area matching the objective best and having a high degree of decision credibility.

The methodology for a systematic approach to solving issues of assessing the attractiveness of territories using the hierarchy method includes the following steps:

Stage 1. Analysis of the problem, choice of objective and definition of the task.

The challenge is to develop an operational methodology for assessing the investment attractiveness of locations in a region under conditions of informational uncertainty about indicators of the economic situation at the time of making a decision.

Objective: to develop a methodology for a express assessment of the attractiveness of territories in a region based on expert data on the state of key macroeconomic factors with the construction of a scale of competitiveness of territories.

Objective setting: there are many proposals for the investment attractiveness of places in the region (municipalities) $T=\{T_1, T_2, \ldots, T_k\}$. Each of the alternatives T_i is characterised by a set of macroeconomic evaluation criteria for the territory: $K=\{K_1, K_2, \ldots, K_n\}$. It is necessary to develop a ranking of the attractiveness of the territories of the region, which will act as a scale for assessing their competitiveness.

Stage 2. Development of criteria (factors)$\{K_i\}$ for the investment attractiveness of territory $\{T_j\}$ of the region. The local criteria for assessing the competitiveness of territories within a region depend on the set objectives of the customer – municipal administration, potential investor, line ministry, specific individual, etc. We will assume the determining of the choice of criteria in the express assessment of a territory by its aggregate potential including the following main indicators: labour resources (quality of labour force) - K_1, infrastructure development - K_2, natural resources - K_3, production potential - K_4, ecology - K_5. The selected indicators will be regarded as criteria for assessing the attractiveness of the territory. Such indicators are deeply universal and cannot be clearly defined, but by expert comparison it is possible to assess whether the situation for the territory analyzed is more negative or positive one.

Therefore, there can exist a lot of criteria, depending on the depth of the objective when assessing the attractiveness of a region. The academia literature offers many criteria for assessing investment attractiveness, the choice of which depends on the objectives of the investor or the objectives of a particular government agency.

Stage 3. Selection of alternatives for the territories to be assessed. We consider four alternative territories in the region: $T=\{T_1, T_2, T_3, T_4, T_5\}$ in terms of their investment attractiveness.

Stage 4. Developing the structure of the decision tree when selecting an investment-attractive territory of the region (Figure 1).

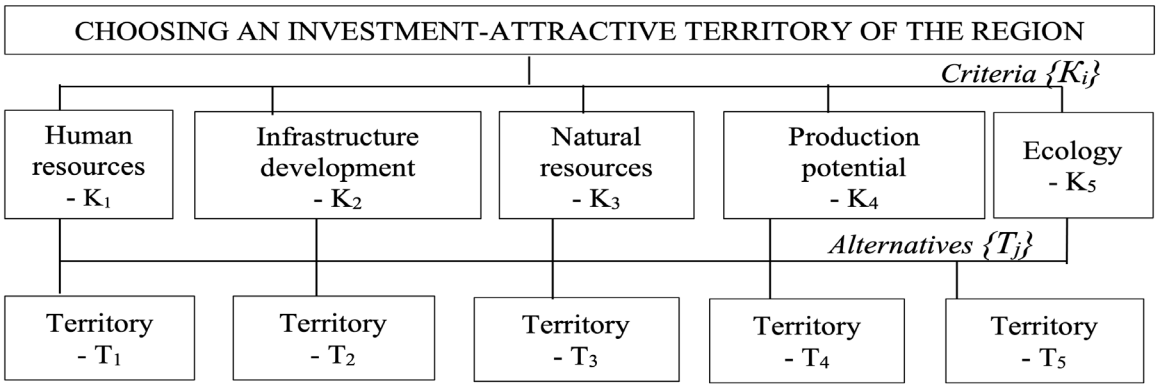

Figure 1. Decision tree of territories choosing

Source: composed by the authors

Stage 5. Development of expert matrices of binary criterion-alternative relationships.

5.1 Calculating the weight (significance) of the territory assessment criteria.

Method of hierarchy theory by T. Saaty suggests using a 9-point scale of relative importance:

$$T = \begin{cases} 1, \text{if the relationships are equal: } T_i = T_j; \\ 3 \text{ or } \frac{1}{3}, \text{if } T_i \text{ is marginally better (worse) } T_j; \\ 5 \text{ or } 1/5, \text{if } T_i \text{ significantly better (worse) } T_j; \\ 7 \text{ or } \frac{1}{7}, \text{if } T_i \text{ significantly better (worse) } T_j; \\ 9 \text{ or } 1/9, \text{if } T_i \text{ is best in the most (the worst) } T_j. \end{cases}$$

The interval scale can contain also intermediate scores: 2, 4, 6, 8.

5.2 Calculation of the significance (weight) of the territory assessment criteria.

Each of the criteria $\{K_i\}$ adopted in the problem can have an ambiguous impact on the evaluation of the territory due to the specificity of the investment attractiveness selection task, so they must be defined before deciding on the selection of area T_i.

Expert research conducted by the authors with a group of potential investors enabled the creation of an M1 matrix of pairwise comparisons of the weights of the assigned criteria $\{K_i, i=1, 2, 3, 4, 5\}$:

$$M1 = \begin{array}{c} \\ K_1 \\ K_2 \\ K_3 \\ K_4 \\ K_5 \end{array} \begin{array}{c} \begin{array}{ccccc} K_1 & K_2 & K_3 & K_4 & K_5 \end{array} \\ \begin{pmatrix} 1 & 2 & 0.333 & 3 & 4 \\ 0.5 & 1 & 3 & 2 & 3 \\ 3 & 0.2 & 1 & 3 & 5 \\ 0.333 & 0.333 & 0.333 & 1 & 3 \\ 0.25 & 0.333 & 0.2 & 0.333 & 1 \end{pmatrix} \end{array}; \quad M11 = \begin{array}{c} C_i \\ \begin{bmatrix} 0.263 \\ 0.242 \\ 0.311 \\ 0.127 \\ 0.054 \end{bmatrix} \end{array}$$

We add data to the resulting matrix M1. Sum up the values of the criteria by rows: $S_{ij} = \sum K_{ij}$ and similarly by columns: S_{ji}. We determine a weighted value for each line by the formula: $C_{ji} = \sum\sum S_{ji}/\sum S_{ij}$, which will characterize the "weight" of the criterion (factor) of the territory attractiveness assessment, which can be written in the form of matrix-column M11 of the importance of the named factors.

There is a need to do a check on the values of $\{K_i\}$ by the opinion consistency index $Ic=(\lambda_{max}-n)/(n-1)$, where n is the matrix size; λmax is the intermediate parameter: $\lambda_{max} = \sum S_i C_i = 5.083*0.263+3.866*0.242+$ $+4.866*0.311+9.333*\ 0.127+16*0.054 = 5.835$. This way $Ic=(5{,}835-5)/4=0{,}209$. For n=5, the value of the random inconsistency Ri is 1.12 (Saaty, 2014). For the correct matrix the consistency ratio is $Cr=Ic/Ri=0.209/1.12=0.187$. Method requirement is Cr<0.2. We met the requirement.

By the M2 criterion matrix, the most weighted factor is "Natural Resources" with a share of 0.311, followed by "Quality of Workforce" with a weight of 0.263, followed by "Infrastructure Development" (0.242) and "Productive Capacity" (0.124). The factor "Environment" has the lowest weighting factor of 0.054.

5.3 We develop the M2 matrix of expert assessment of pairwise comparisons of territories $\{T_i$ i=1, 2, 3, 4, 5} according to the criterion "Human resources - K1".

Proceeding with the numerical field of matrix M2 at the same way as with field M1, we obtain a new matrix-column M21 of significance of territories according to criterion K1.

$$M2 = \begin{array}{c} K_1 \\ T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \end{array} \begin{array}{c} \begin{array}{ccccc} T_1 & T_2 & T_3 & T_4 & T_5 \end{array} \\ \begin{pmatrix} 1 & 3 & 5 & 0.333 & 0.111 \\ 0.333 & 1 & 1 & 3 & 0.143 \\ 0.2 & 1 & 1 & 0.143 & 0.111 \\ 3 & 0.333 & 7 & 1 & 0.333 \\ 9 & 7 & 9 & 3 & 1 \end{pmatrix} \end{array} \quad M21 = \begin{array}{c} C_i \\ \begin{bmatrix} 0.165 \\ 0.096 \\ 0.043 \\ 0.204 \\ 0.508 \end{bmatrix} \end{array}$$

For the criterion "Human Resources", based on the data in Column C_i – "Criterion Weight", the most attractive territory is T_5 with a significance of 0.508, followed by T_4 (0.204), T_1 (0.165) and T_2 (0.096), respectively. The T_3 territory has a minimum significance of 0.043. A ranking scale can be developed by the M21 matrix as a tool to assess, compare and make investment decisions using only the "Human Resources" criterion.

5.4 The M3 matrix of the expert assessment of the territory $\{T_i\}$ according to the criterion "Infrastructure development - K2" and its derivative M31 will be as follows:

$$M3 = \begin{array}{c} K_2 \\ T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \end{array} \begin{array}{c} \begin{array}{ccccc} T_1 & T_2 & T_3 & T_4 & T_5 \end{array} \\ \begin{pmatrix} 1 & 1 & 3 & 0.2 & 0.333 \\ 1 & 1 & 3 & 0.333 & 1 \\ 0.333 & 0.333 & 1 & 0.333 & 0.333 \\ 5 & 3 & 3 & 1 & 0.333 \\ 3 & 1 & 3 & 3 & 1 \end{pmatrix} \end{array} \quad M31 = \begin{array}{c} C_i \\ \begin{bmatrix} 0.127 \\ 0.177 \\ 0.068 \\ 0.301 \\ 0.326 \end{bmatrix} \end{array}$$

By the matrix-column M31 of the significance of territories according to the criterion "Infrastructure Development - K2", the most significant territory is T_5 with a weight of 0.326, followed by T_4 (0.301), T_2 (0.177) and T_1 (0.127), respectively. Territory T_3 has the lowest significance at 0.068.

5.5 The M4 matrix of expert assessment of territories $\{T_i\}$ according to the criterion "Natural Resources - K3" and its derivative M41 will be as follows:

$$M4 = \begin{array}{c} K_3 \\ T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \end{array} \begin{array}{c} \begin{array}{ccccc} T_1 & T_2 & T_3 & T_4 & T_5 \end{array} \\ \begin{pmatrix} 1 & 0.333 & 1 & 0.2 & 1 \\ 3 & 1 & 0.333 & 0.333 & 1 \\ 1 & 3 & 1 & 0.333 & 5 \\ 5 & 3 & 3 & 1 & 1 \\ 1 & 1 & 0.2 & 1 & 1 \end{pmatrix} \end{array} \quad M41 = \begin{array}{c} C_i \\ \begin{bmatrix} 0.098 \\ 0.136 \\ 0.261 \\ 0.363 \\ 0.141 \end{bmatrix} \end{array}$$

By the matrix-column M41 for "Natural Resources" criterion, the most significant is T_4 with a weight of 0.363, followed by T_3 (0.261), T_5 (0.141) and T_2 (0.136), respectively. The T_1 territory has the lowest weighting factor of -0.098.

5.6 The M5 matrix of expert evaluation of territories $\{T_i\}$ according to the criterion "Productive potential - K4" and its derivative M51 will be as follows:

$$M5 = \begin{array}{c} K_4 \\ T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \end{array} \begin{array}{c} \begin{array}{ccccc} T_1 & T_2 & T_3 & T_4 & T_5 \end{array} \\ \begin{pmatrix} 1 & 3 & 3 & 0.2 & 0.143 \\ 0.333 & 1 & 1 & 3 & 0.2 \\ 0.333 & 1 & 1 & 0.333 & 0.333 \\ 5 & 0.333 & 3 & 1 & 3 \\ 7 & 5 & 3 & 0.333 & 1 \end{pmatrix} \end{array} \quad M51 = \begin{array}{c} C_i \\ \begin{bmatrix} 0.141 \\ 0.174 \\ 0.070 \\ 0.303 \\ 0.310 \end{bmatrix} \end{array}$$

By the matrix-column M51, the territory T_5 (0.31) is the most weighted in terms of "Productive Potential", followed by the territory T_4 (0.303), T_2 (0.174%) and T_1 (0.141), respectively. Territory T_3 has the lowest significance at 0.07.

5.7 The M6 matrix of expert assessment of territories $\{T_i\}$ according to the criterion "Ecology - K5" and its derivative M61 will be as follows:

$$M6 = \begin{array}{c} K_5 \\ T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \end{array} \begin{array}{c} \begin{array}{ccccc} T_1 & T_2 & T_3 & T_4 & T_5 \end{array} \\ \begin{pmatrix} 1 & 0.333 & 1 & 1 & 3 \\ 3 & 1 & 3 & 3 & 5 \\ 1 & 0.333 & 1 & 1 & 1 \\ 1 & 0.333 & 1 & 1 & 1 \\ 0.333 & 0.2 & 1 & 1 & 1 \end{pmatrix} \end{array}; \quad M61 = \begin{array}{c} C_i \\ \begin{bmatrix} 0.173 \\ 0.448 \\ 0.137 \\ 0.137 \\ 0.104 \end{bmatrix} \end{array}$$

By the matrix-column M61 for the criterion "Environment - K5", the most weighted territory is T_2 (0.448%), followed by T_1 (0.173), T_3 and T4 at 0.137. The T_5 territory has the lowest weighting factor of -0.104.

Stage 6. Development of a combined M7 matrix of territory alternative weights for each criterion from the previously obtained columns C_i, i=1, 2, 3, 4, 5:

$$M7 = \begin{array}{c} \\ T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \end{array} \begin{array}{c} \begin{array}{ccccc} K_1 & K_2 & K_3 & K_4 & K_5 \end{array} \\ \begin{pmatrix} 0.165 & 0.127 & 0.098 & 0.141 & 0.173 \\ 0.096 & 0.177 & 0.136 & 0.174 & 0.448 \\ 0.043 & 0.068 & 0.261 & 0.070 & 0.137 \\ 0.204 & 0.301 & 0.363 & 0.303 & 0.137 \\ 0.508 & 0.326 & 0.141 & 0.310 & 0.104 \end{pmatrix} \end{array}$$

Stage 7. Determining the significance of territories alternatives.

The values of the territory alternatives can be determined by multiplying the matrix-column M11 by the criterion weight column of the matrix M7. The resulting M8 matrix-column will act as an integrated assessment vector of the significance of the territory alternatives in terms of the objective and the assigned criteria:

$$M8 = M7 \cdot M11 = \begin{pmatrix} 0.132 \\ 0.156 \\ 0.125 \\ 0.285 \\ 0.301 \end{pmatrix}$$

According to the column of the M8 matrix, the priority ranking of the territories from the position of investment attractiveness would be as follows: $T_5 > T_4 > T_2 > T_1 > T_3$. This ranking result allows us to develop a ranking scale R for the priority of territories in terms of the region's investment attractiveness (Figure 2):

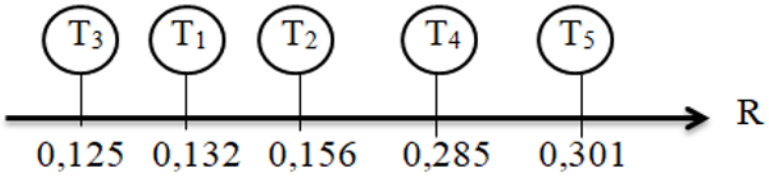

Figure 2 Rating scale for the attractiveness of territories of the region

Source: composed by the authors

By the data of the M8 matrix and Figure 2, it is possible to make a quantitative comparison of the assessments of the attractiveness of territories according to the assigned criteria. For instance, territory T5 is 1.38 times more attractive than territory T_4 or by 38% (0.396/0.287), leader territory T_5 is more attractive than outsider territory T_3 by 3.63 times (0.396/0.108).

A ranking scale allows a qualitative comparison of territories. The range of rating scale ΔR=Rmax - Rmin, where Rmax is the maximum value of assessment of territories on the rating scale, Rmin is the minimum value, should be divided, for example, into three verbal rate intervals with the step ΔR/3=(0.301 - 0.125)/3=0.059: high attractiveness (0.301 - 0.242), medium (0.241 - 0.182) and moderate (0.181 - 0.122). A comparison of the Ti value with a specific hit range will determine a verbal rate of the attractiveness of the territory.

Proceeding from the previously accepted thesis of absence the single methodology for the territories competitiveness assessing due to the multitude of objectives and assessment criteria, the methodology of competitiveness assessment based on T. Saaty's hierarchy theory can be trusted poorly.

In order to benchmark the solutions obtained, we consider the results of the assessment based on the competitiveness polygon method, which is able to rapidly assess the competitiveness of territories, identifying strong and weak factors. Each face of the polygon of the compared territory (Figure 3) is located along the

rating axes Ri, where Ri (KJ) is the value of the factor KJ on the ranking scale Ri of the evaluation of the i-th territory; j=1, 2, ..., n; n - number of criteria; m – number of compared territories. All {KJ} values are taken in accordance with the factor matrices discussed earlier: M21, M31, M41, M51, M61.

By this model, the total area of the polygon Si of the territory under study TI, acts as an integral indicator of its competitiveness and is calculated in the axes of the adopted factors according to the formula:

$$Si=0,5*\sin(360/n)[Ri(K1)* Ri(K2)+ Ri(K2)* Ri(K3)+ Ri(K3)* Ri(K4)+ Ri(K4)* Ri(K5)]$$

where Ri(KJ) is the value of the factor KJ on the ranking scale Ri of the assessment of the i-th territory; j=1, 2, ..., n; n is the number of criteria; m is the number of territories being compared.

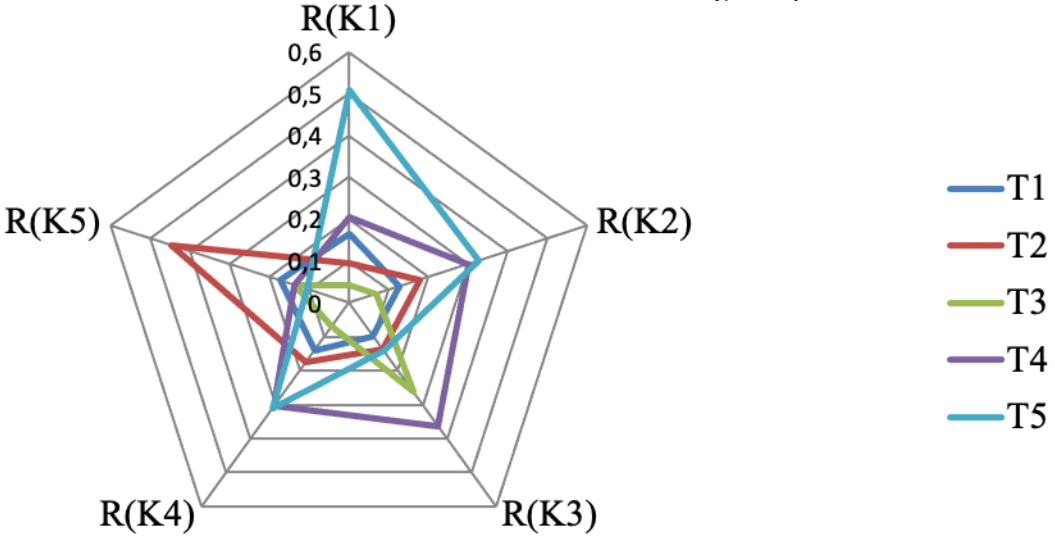

Figure 3. Territorial competitiveness polygon model

Source: composed by the authors

Based on the calculated data of the areas of each polygon, a competitiveness ranking scale of the analyzed territories is developed (Figure 4).

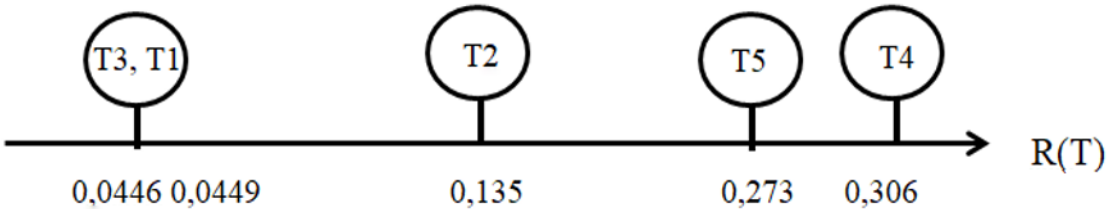

Figure 4. Polygon competitiveness rating scale for territories

Source: composed by the authors

The ranks of the territories in the figures are almost identical and should be taken into account, but the values on the rating scales cannot be compared because of the different dimensionality: in Figure 3 the system is dimensionless and in Figure 4 in square units.

For a more objective assessment of the competitiveness of territories, consider also the 'ideal point' method. In the multi-criteria space of rating scales, we represent the i-th territory as a point with the coordinate $T_i = T(R_i(K1), R_i(K2), \ldots, Ri(K5))$.

We establish the coordinates of the virtual territory as an "ideal point" (Ti) in the multi-criteria space of rating scales: $T_i = T(Rmax(K1), Rmax(K2), ..., Rmax(K5))$, where Rmax(KJ) is the maximum value of factor KJ from matrices M21, M31, M41, M51, M61.

In the proposed model, the integral indicator of communication competitiveness: Kr will be the shortest distance L(Ti, Ti) between the coordinates of points Ti and Ti in multi-criteria space.

$$Kr= L(Ti, Ти)= (\Sigma(R\ imax(KJ)- Ri(KJ))2)^{1/2} \rightarrow min,\ i=1, 2,\ldots,m..$$

By the formalized length criterion: the lower the value of Kr, the closer the analyzed territory is to the ideal (virtual) project, the higher its level of competitiveness. The Kr criterion serves as a tool for selecting

reasonable solutions, allows the ranking of the analyzed projects, and determines their relative strength/weakness in terms of ratio.

The rating scale according to the 'ideal point' method in Figure 5.

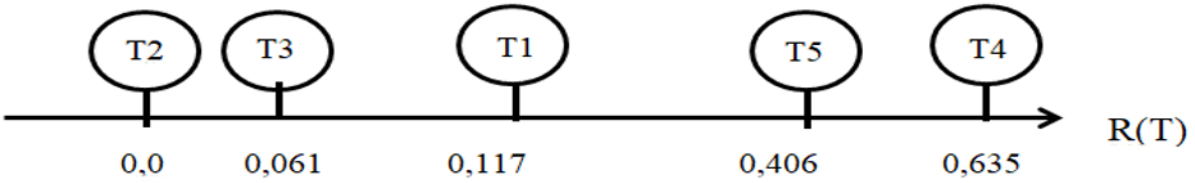

Figure 5. 'Ideal point' competitiveness rating scale for comparison territories

Source: composed by the authors

When analyzing the competitiveness rating scales, it can be concluded the presence of unity of comparing ranks. They are dimensionless. Table 1 shows the values of the ranking method for assessing the competitiveness of territories.

Table 1 – Distribution of territories by competitiveness ranking

Territory	Ranks of territories			Average value of ranks	Ratings of territories
	Hierarchy method	Polygon method	The "ideal point" method		
T1	4	4	3	3.667	4
T2	3	3	5	3.667	4
T3	5	5	4	4.667	5
T4	2	1	1	1.334	1
T5	1	2	2	1.667	2

Source: composed by the authors

By the column "Average rank of the territory" in Table 1, a ranking scale of competitiveness (attractiveness) of the territories of the region can be constructed and their numerical comparison can be made.

It is appropriate to consider the final assessment of territories in accordance with a rating scale for the qualitative assessment of the investment attractiveness of a region, for example, according to the methodology of the National Rating Agency. The interval scale, proposed by the authors, will be a refining scale in assessing the attractiveness of the analyzed territories of the region.

Conclusions

The methodology is both original and simple; the technology of the hierarchy method is necessary for operational research in comparing the alternatives of territories, the choice of the best option for the object of investment, making management decisions.

The methodology of express assessment of competitiveness of territories allows us to make objective territories assessment based on the use of the instrumental method of analysis of hierarchies T. Saaty

The methodology allows us to develop an integral assessment of the attractiveness of territories for investment based on the significance of macroeconomic factors, which making a well-founded choice of management decisions possible.

The proposed comparative scale for rating the attractiveness of territories in a region will provide quantitative and qualitative differences in the attractiveness of territories in the region and can act as a tool for assessing their competitiveness.

The results of the methodology for assessing the investment attractiveness of a territory are documents, administrative acts, guidelines or regulations, which not only allow a numerical assessment of the competitiveness of territories in the region, but also increase the reliability of managerial decisions when deciding on investment.

References

1. Ataeva, N. Y. (2015). Research in the investment attractiveness of municipalities. *Voprosy territorial'nogo razvitiya*, (3), 1-12. Retrieved from http://vtr.isert-ran.ru/article/1485 (accessed 10.05.2022) (in Russian).

2. Baronov, G. O. (2017). The impact of a project management system on the investment attractiveness of a region. *Ekonomika i socium*, *1-1*(32), 168-175 (in Russian).

3. Valinurova, L. S. (2017). Developing a system of controlling the investment attractiveness of a municipality. *Ekonomika i upravlenie*, (4), 132-135 (in Russian).

4. Vologdin, E. V. (2017). *Evaluation of the region's investment attractiveness: theory and practice (on the example of Altai Krai).* Barnaul: Izd-vo AltGU. Retrieved from https://docplayer.com/78836966-E-v-vologdin-ocenka-investicionnoy-privlekatelnosti-regiona-teoriya-i-praktika-na-primere-altayskogo-kraya.html (accessed 01.05.2022) (in Russian).

5. Glazyrin, M. V. (2014). On Creating a System of Integrated Municipal Development. *Ekonomist*, (3), 79-84 (in Russian).

6. Emelyanov, Y. S., & Leonova, Y. Y. (2016). On Indicators of Assessing Investment Attractiveness of Russian Regions. *Upravlencheskie nauki v sovremennom mire*, *2*(2), 501-506 (in Russian).

7. Zhukov, R. A., Vasina, M. V., Soboleva, D. V., & Polyakov, V. A. (2018). Formation of a system of views on the process of managing the sustainable development of the region. *Nauchnye issledovaniya i razrabotki. Ekonomika*, *6*(6), 48-53 (in Russian).

8. Zhukov, R. A., Vasina, M. V., Soboleva, D. V., & Polyakov, V. A. (2018). Optimal management as a factor of sustainable development of industrial socio-economic systems. *Samoupravlenie*, (S1), 64-66 (in Russian).

9. Zhukov, R. A., Vasina, M. V., Soboleva, D. V., & Polyakov, V. A. (2018). Some aspects of economic evaluation of sustainable development of the regions of the Central Federal District and Tula Region. *Izvestiya Tul'skogo gosudarstvennogo universiteta. Ekonomicheskie i yuridicheskie nauki*, (3-1), 3-11 (in Russian).

10. Ivanov, D. V., & Sokolitsyn, A. S. (2018). Assessing the investment attractiveness of municipalities. *Ekonomika i upravlenie narodnym hozyajstvom*, (2), 43-49 (in Russian).

11. Kosobutskaya, A. Y., & Ravuanjirina, A. V. (2019). Investment attractiveness of the region: assessment methods. *Vestnik VGU. Seriya: Ekonomika i upravlenie*, (1), 32-37 (in Russian).

12. Litvinova, V. V. (2013). *Investment attractiveness and investment climate of the region*. M.: Finansovyi universitet (in Russian).

13. Narolina, Y. V. (2009). Investment potential and investment risk as the main components of the region's investment attractiveness. *Vestnik TGU*, (12), 137-143 (in Russian).

14. Nagaev, S., & Woergoetter, A. (1995). *Regional Risk Rating in Russia*. Vienna: Bank Austria AG. Econ. dep.

15. National Rating Agency. (2021). *Rating of investment attractiveness of Russian regions.* Retrieved from http://www.ra-national.ru/ru/ratings/provinces?type=rating (accessed 01.05.2022).

16. Panaseikina, V. S. (2011). Formation of a methodology for assessing the investment attractiveness of municipalities. *Kontury global'nykh transformatsii: politika, ekonomika, pravo*, (4), 45-54 (in Russian).

17. Petrov, I. V. (2017). Review of methods for assessing the investment attractiveness of regions. *Molodoi uchenyi*, (23), 57-61 (in Russian).

18. Polyakov, V. A., Fomicheva, I. V., & Yudina, O. V. (2021). The choice of commercial real estate for business according to the technology of the hierarchy analysis method. *Nauchnye issledovaniya i razrabotki. Ekonomika*, (1), 12-16 (in Russian).

19. Saaty, T. (1993). *Decision Making. The method of hierarchy analysis*. M.: Radio i svyaz' (in Russian).

20. Sandu, I. S., Bogoviz, A. V., Ryzhenkova, N. E., & Troshin, A. S. (2016). Methodological provisions for assessing the innovation and investment attractiveness of regions. *Gosudarstvennyi audit. Pravo. Ekonomika*, (4), 78-85 (in Russian).

21. Suglobov, A. E., & Morozov, I. A. (2016). Methodological support for assessing the investment at-

tractiveness of the production potential of depressed regions. *Vestnik Moskovskogo universiteta MVD Rossii*, (1), 200-205 (in Russian).

22. Trachenko, M. B., & Dzhioev, V. A. (2018). Express analysis of investment attractiveness of regions. *Financy i kredit*, *24*(9), 2151-2165 (in Russian).

Received 03.05.2022
Revised 02.06.2022
Accepted 10.06.2022