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Management of Investment Processes in the Regions of the Russian Federation on the Basis of a Balanced System of Indicators

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ABSTRACT

The **purpose** of the research is to develop, based on the concept of a balanced system of indicators, a methodology for assessing investment processes in the constituent regions of the Russian Federation, which makes it possible to track the relationship between the dynamics of the investment attractiveness of each region and the balance of investment policy. The **relevance** of development a practice-oriented methodology, on the basis of which it is possible to determine the effectiveness of decisions when choosing investment directions, is conditioned by the limited investment resources in the current conditions of the impact of politics on the economy. The **scientific novelty** consists in the original balanced system of indicators and the balanced evaluation methodology proposed by the authors as a tool for managing. The main research **methods** are systematic and balanced approaches, the methodology of the balanced system of indicators, the method of multidimensional average (for determining integral indicators) and correlation analysis (to analyse the relationship between investment attractiveness calculated on the basis of the developed system of indicators, and investment activity) are used as private methods. The main **result** of the research: the creation on the basis of the developed balanced system of indicators of an economic model for assessing the balance of investment policies as a mechanism for coordination the interests of private investors, public administration and the population. On the basis of approbation of the developed economic model (on the example of one of the regions of the Arctic zone — the Republic of Komi), the authors **concluded:** the imbalance of investment processes, revealed on the basis of the multidirectional dynamics and differentiation of the values of indicators by components of the proposed assessment system, limits the implementation of the investment potential of the Republic of Komi and reinforces the structural imbalances. The proposed model of assessment allows diagnose the investment problems in the regions of the Russian Federation, finding investment growth reserves, identifying investment priorities and improving the sustainability of investment management.

Keywords: investment policy; investment activity; investment attractiveness; investment significant factors; balanced system of indicators

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INTRODUCTION

Analysis of the structure of investments in the Arctic zone of the Russian Federation (hereinafter — AZ) can come to the conclusion about concentration of investment resources mainly in export-raw materials production and underdevelopment of the sector for deep processing of natural resources, for which domestic demand remains high. Such an inconsistency between demand and supply points to the spontaneous development of economies in many regions, mainly raw materials-oriented regions.

This structural imbalance has arisen and has persisted for a long time in AZ due to the lack of science-based investment policies in the region. An economic mechanism for reconciling the interests of private investors, the State and the population is needed to redress imbalances. Such a mechanism should be based on a system of indicators reflecting the economic relationship between the State and private business in terms of a balance of interests. It is about a balanced scorecard (hereinafter — BSC).

The problem of assessment of investment activity in AZ and its regulation on the basis of consideration of interests of various groups of participants in the investment process is not paid due attention in the studies, which explains the urgency of developing a balanced evaluation system of social and economic indicators.

This paper proposes a new methodological approach to assessment of investment activity: to consider the possibility of using the developed BSC as a tool for integrated assessment of the activities of regional governments and investment flows management.

In regional economic researches, factor approach is the most common, determining the investment attractiveness of regional economic systems [1, 2]. The purpose of most modern assessment methods is construction of ratings that demonstrate a significant differentiation of investment attractiveness of the regions of the Russian Federation and allow investors to get an idea of the advantages of some regions over others. Meanwhile, the analysis of the effectiveness of regional investment policy at the initial stage of the study requires an analysis of the dynamics of the investment attractiveness of individual regions.

Available results of investment ratings of regions are not comparable. Main reason — imperfection of the methodological apparatus. Thus, the use in many methods of [3] points, mainly expert assessment, and statistical (not expert) assessment in the research of factors of investment attractiveness leads to ignoring the real variation of actual values of the indicators of assessment, should not depend on the opinion of experts. In addition, for most methods are characterized by a lack of objective criterion of reliability (relationship with the investment activity of the region), which is a significant methodological shortcoming. The results of these ratings do not fully correspond to the information requests of all groups of users. In addition, the use of these ratings for management decision-making is limited by the structural differences of regional economies. During the standardization procedure in modern methods the normalizing indicator is mainly used by the average Russian values of indicators, so the results of the assessment are dependent on all-Russian data.

In order to assess the balance of investment policy of a particular region, it is necessary to use measuring tools independent of changes in the investment attractiveness of other regions. The use of target values of indicators in the proposed BSC as normalizing indicator eliminates the influence of all-Russian data.

The identification of methodological shortcomings in the study of investment attractiveness of the regions of the Russian Federation served the basis for the search for new approaches to the assessment of the regional investment process, why it is necessary to create author's methods

of assessment on the basis of a balanced approach, that the results of the assessment correspond to the balance of interests of the investors.

METHODOLOGY AND RESEARCH METHODS

The concept of balanced scorecard is the conceptual basis of the author's methodology. BSC was originally introduced as a matrix approach to measuring organizational effectiveness. The financial indicators mainly used to assess business efficiency were supplemented by indicators of three other "prospects" (components): learning and growth, internal business process and customer component according to the interests of business participants [4]. A feature of the second generation of BSC was the definition of cause-and-effect relationships between indicators and strategic objectives as the main criterion for the choice of indicators. Based on the graphical presentation of the main relationships, strategic map models were created [5]. Kaplan and Norton reported that these changes allowed BSC to move from an improved assessment system to a basic performance management system. Development of balanced assessment methodology presented in sources [6–10].

Despite the rather wide use of BSC in individual enterprises efficiency management [11–17], researchers have not considered the possibility of applying BSC to the assessment of investment attractiveness of regions.

The principle of selection of BSC indicators based on the relationship with key investment relevant factors [18] allows to abandon the use of weight coefficients, which ensures equivalence of indicators and improves the objectivity of the assessment (independence from expert assessment).

In the definition of integral indicators, the formula of multidimensional average is used, when conducting the procedure of preliminary standardization as a normalizing indicator, target values of indicators are used, which eliminates the impact of the Russian average investment attractiveness.

In this paper, the term "indicator target value" refers to the desired level of the corresponding aspect of investment attractiveness, which is assessed against a specific indicator and can be achieved within the study objectives during the time gap. Target values of indicators developed by BSC are determined on the basis of research and comparative analysis of investment activity in AZ regions.

The results of the process of balanced estimate of the investment policy of one of the subjects of the AZ of the Russian Federation (Komi Republic) on the example of the component of the development of the BSC are presented in *Table 1*.

The composition of private indicators for the components of the developed BSC is presented on *Fig. 1*. The BSC configuration is determined by significant investment factors (production-financial, institutional, natural-resource, infrastructure, political-economic and social) and information needs of user groups.

The private indicators developed by BSC were selected on the basis of the relationship with the key factors that determine the situation in the investment sphere AZ regions of the Russian Federation, which allows the assessment to identify possible ways of influencing investment dynamics.

The selection of key investment significant factors was made on the basis of the criterion "maximum representativeness and investment value" taking into account the specifics of the AZ regions of the Russian Federation. The approach used in determining key success factors in the Balanced Scorecard management concept [4].

Indicators for FTA (foreign trade activities) "Mining", "Manufacturing industries" reflect the sectoral structure of the economy of the regions. First of all,

Table 1

Calculation of Indicators of the Development Component of the Balanced System of Indicators for Assessing the Balance of the Directions of Investment Policy of the Republic of Komi (2011–2018)

Indicator name	Target value of Піц indicators	Ratio of actual and target values of Пі/Піц indicators							
		2011	2012	2013	2014	2015	2016	2017	2018
1. Indicators of intellectual capacity									
1. Share of people with higher education	0.40	0.01	0.01	0.76	0.79	0.81	0.83	0.84	0.86
2. Skills ratio	0.50	0.31	0.26	0.29	0.28	0.26	0.28	0.09	0.09
Integral indicator		0.16	0.13	0.52	0.54	0.53	0.55	0.47	0.47
2. Indicators of innovation capacity									
3. Share of R&D expenditure	0.10	0.04	0.04	0.04	0.05	0.04	0.05	0.04	0.04
4. Share of costs of technological innovation	0.05	0.06	0.71	0.12	0.06	0.07	0.03	0.05	0.24
5. Information technology ratio	1.50	0.76	0.65	0.74	0.68	0.82	0.67	0.71	0.86
6. Rate of renewal of fixed assets	0.15	0.30	0.37	1.34	0.55	0.64	0.37	0.57	0.30
7. Investment capacity ratio of sold products	0.20	1.59	2.32	2.42	2.06	2.08	1.62	1.83	1.17
Integral indicator		0.55	0.82	0.93	0.68	0.73	0.55	0.64	0.52
3. Indicators of infrastructure capacity									
8. Density of communication	60.0	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.20
Integral indicator		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.20
Integral indicator by component		0.39	0.55	0.72	0.57	0.60	0.49	0.53	0.47

Source: Compiled by the authors.

prospective economic specializations of AZ regions of the Russian Federation, defined in the Strategy of spatial development of the Russian Federation for the period up to 2025, are taken into account. To calculate a number of indicators the authors used the method of calculation of national and federal projects indicators.

Algorithm of application of the developed economic model:

1. Formalization of regional investment policy objectives in the form of a set of quantitative and qualitative indicators — target values of BSC indicators.

2. Calculation of the actual achieved values of BSC indicators, informatively reflecting the results of the implementation of the regional investment policy.

3. Determine the degree of achievement by comparing the actual and target values of the indicators.

4. Formation of investment policy of the region on the basis of revealed deviations of actual values of BSC indicators from the target (>25%).

The results of the developed assessment model are expected to be used by the regional management bodies of AZ regions in the formation of investment policy.

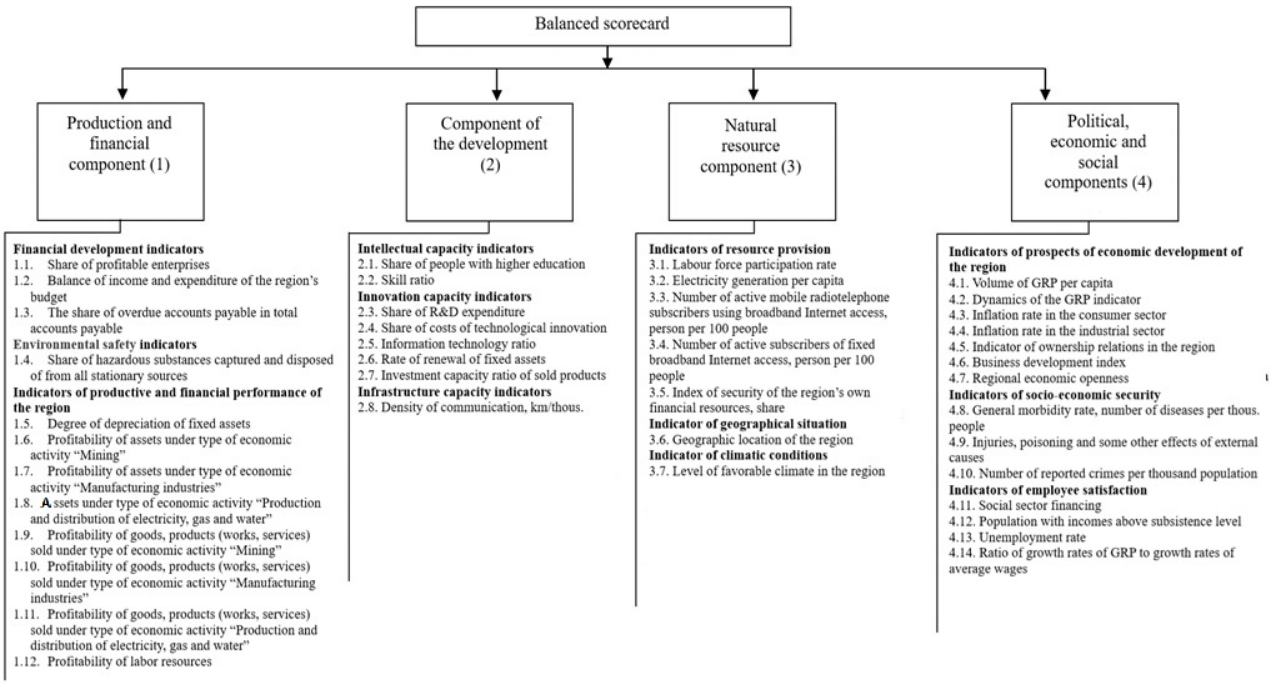

Fig. 1. **BSI Nomenclature to Assess the Balance of Investment Policy of the Regions of the Arctic Zone**

Source: Compiled by the authors.

RESULTS AND DISCUSSION

Investment attractiveness of AZ regions assessed on the basis of four components developed by BSC for 2011–2018 (2011 year was selected as the base period). The results of the estimate are presented in *Table. 2.*

The result of analysis of investment attractiveness of AZ regions, calculated on the basis of developed BSC, and investment activity in them, is considered as the main criterion of reliability of the developed methodology (within the time lag) (*Table 3*).

Investment activity reflects the region's use of investment attractiveness and should therefore be used taking into account the investment lag in the investment proposals (the investor's decision to invest) from investment demand (defined by changes in investment conditions).

This paper uses the simplest lag model

$$y_i = f\left(x_{t-\tau}\right), \qquad (1)$$

which means the following: the value of endogenous variable *y* (investment activity) at the moment *t* is determined by the value of exogenous variable *x* (investment attractiveness) at the moment $t-\tau$, where τ — time lag.

Different statistical models for lag values are used in the scientific literature. One is based on comparing data on interconnected values with a time shift over a sufficiently long period of time, with different values of possible lag. The lag value (two years) was determined by the nature of the impact curve, which met the selected connectivity requirements. Considering that statistical estimation methods are based on historical results and may not be sufficient to justify the solution of tasks in the new environment, this study also uses an expert logical approach, based on determining the time lag for different types of economic activity [19].

Investment activity is calculated on the basis of two indicators: the rate of change in real investments and per capita volume of these investments [20].

The Spearman correlation coefficient varies from 0.667 to 0.850, indicating an average and high correlation between investment attractiveness and investment activity. Fluctuation of correlation coefficient

Table 2

Dynamics of Integral Indicators of Investment Attractiveness of Arctic Zone Regions (2011–2018)

Year	Krasnoyarsk region	Yamalo-Nenets Autonomous District	Murmansk Oblast	Komi Republic	Arkhangelsk Oblast without NAD	Republic of Karelia	Republic of Sakha (Yakutia)	Chukotka Autonomous District	Nenets Autonomous District
2011	0.842	0.326	0.639	0.628	0.332	0.527	0.535	0.437	0.697
2012	0.745	0.490	0.612	0.623	0.389	0.511	0.579	0.408	0.656
2013	0.723	0.634	0.589	0.588	0.436	0.507	0.525	0.502	0.473
2014	0.793	0.591	0.663	0.557	0.500	0.512	0.529	0.502	0.415
2015	0.840	0.624	0.717	0.599	0.537	0.564	0.522	0.526	0.509
2016	1.016	1.039	0.650	0.618	0.642	0.577	0.592	0.466	0.546
2017	0.828	0.918	0.659	0.604	0.569	0.593	0.564	0.462	0.510
2018	1.664	1.036	0.706	0.655	0.642	0.631	0.577	0.502	0.488

Source: Compiled by the authors.

for the period 2014–2016 is noted, which is acceptable when conducting correlation analysis, identification of causes requires additional research. Bilateral significance for all correlation coefficients does not exceed 0.05 (minimum value 0.004, maximum — 0,050), indicating sufficient reliability of the calculated correlation coefficients. Correlation analysis data confirm the validity of the proposed methodology and the reliability of the evaluation results.

The paper demonstrates the analytical capabilities of the developed BSC for the Komi Republic. A similar analysis can be carried out for any region of the Russian Federation. Among the components of the BSC the maximum value takes the integral indicator by the natural-resource component (0.95), with positive dynamics, which is the basis for the conclusion about the determining role of resource factors in the formation of the investment attractiveness of the Republic of Komi. Private indicators, which are part of the natural resource component, are close to the target or exceed them (the exception is the level of the economically active population), which explains the high value of the integral indicator (*Fig. 2*).

Assessment of financial and production factors allows making a conclusion about the positive influence of these factors on investment attractiveness, the value of the integral indicator is close to the target (0.82). The production and finance component diagram (*Fig. 3*) illustrates deviations from the target values of actual private indicators of the share of profitable enterprises, overdue accounts payable, indicator of environmental

Table 3

Calculation of Correlation Coefficients Between Investment Attractiveness and Investment Activity of Arctic Zone Regions

Indicator	Investment attractiveness (*N* – 2 years) / Investment activity (year *N*)						
	2010/2012	2011/2013	2012/2014	2013/2015	2014/2016	2015/2017	2016/2018
Spearman correlation coefficient	0.483	0.717*	0.850*	0.783*	0.310	0.667*	0.762*
Bilateral significance	0.187	0.030	0.004	0.013	0.417	0.050	0.017

Source: Compiled by the authors

Note: * Is significant at the 5% level.

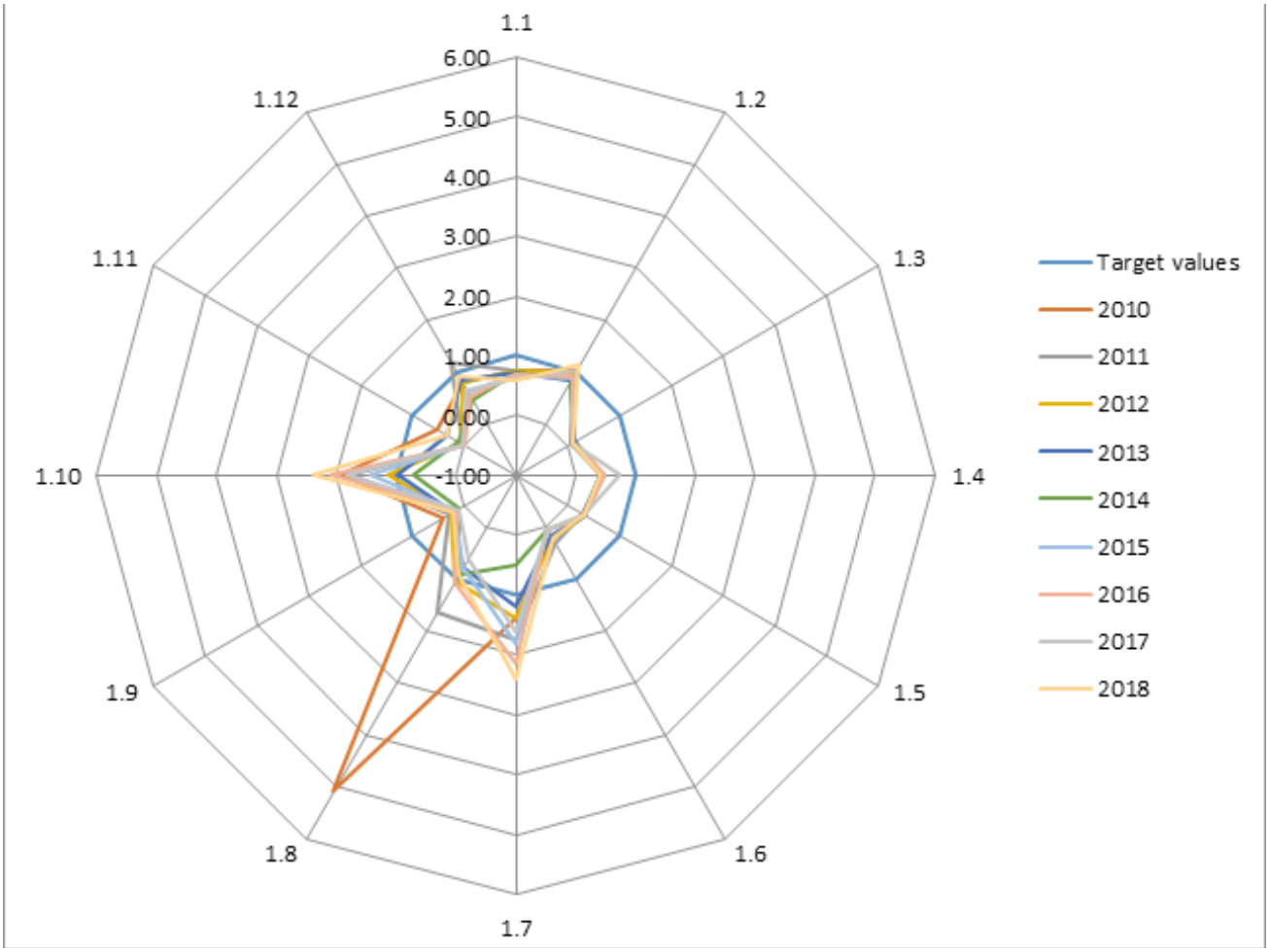

Fig. 2. **Diagram of the indicators of the production and financial component of the BSI evaluation of investment policy of the Republic of Komi for 2011–2018**

Source: Compiled by the authors.

Note: the order of indicators corresponds to the BSI nomenclature for the production and financial component (*Fig. 1*).

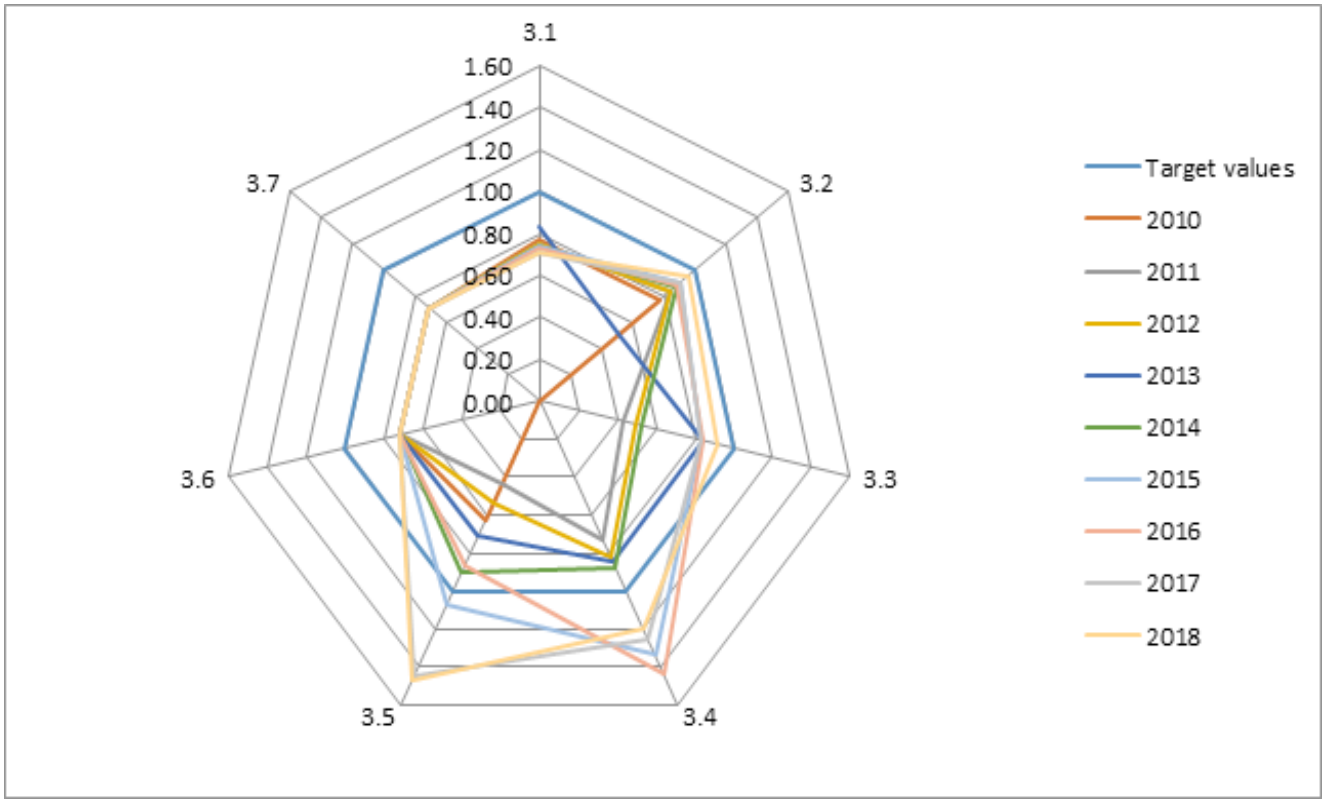

Fig. 3. **Diagram of indicators of the natural resource component of the BSI investment policy of the Republic of Komi for 2011–2018**

Source: Compiled by the authors.

Note: the order of indicators corresponds to the BSI nomenclature for the natural resource component (*Fig. 1*).

safety of production, depreciation of fixed assets.

For the political, economic and social component, the integral indicator in 2011–2018 years accepts values in the range of 0.46–0.53 2 times below the target), which reduces the integral index in general for the BSC. On the diagram of the political, economic and social component (*Fig. 4*) it is clearly traced deviation of indicators of development of market institutions, as well as per capita indicator of volume of GRP, general morbidity, unemployment rate from target values.

The integral indicator for the development component (0.47) has a minimum value in comparison with the rest of the BSC, which is due primarily to the decrease in the indicator of innovation potential. The diagram (*Fig. 5*) shows deviation from the target values of indicators that determine prospects of economic development of the Republic of Komi. Negative dynamics of rates of renewal of fixed assets and investment capacity is an indicator of decline in the perspective of investment activity.

The imbalance of investment policy is confirmed by the different direction of the dynamics and differentiation of values of BSC indicators: for the natural resource component, the integral indicator exceeded the integral indicator for the component of development by 2.3 times. At the same time, the implementation of investment potential is limited by the identified deviations from the target values of both private and integral indicators on components of development, political-economic and social.

The analysis of the results of the assessment using BCS revealed directions to increase the investment attractiveness of the Komi Republic: priority development of manufacturing industries, which belong

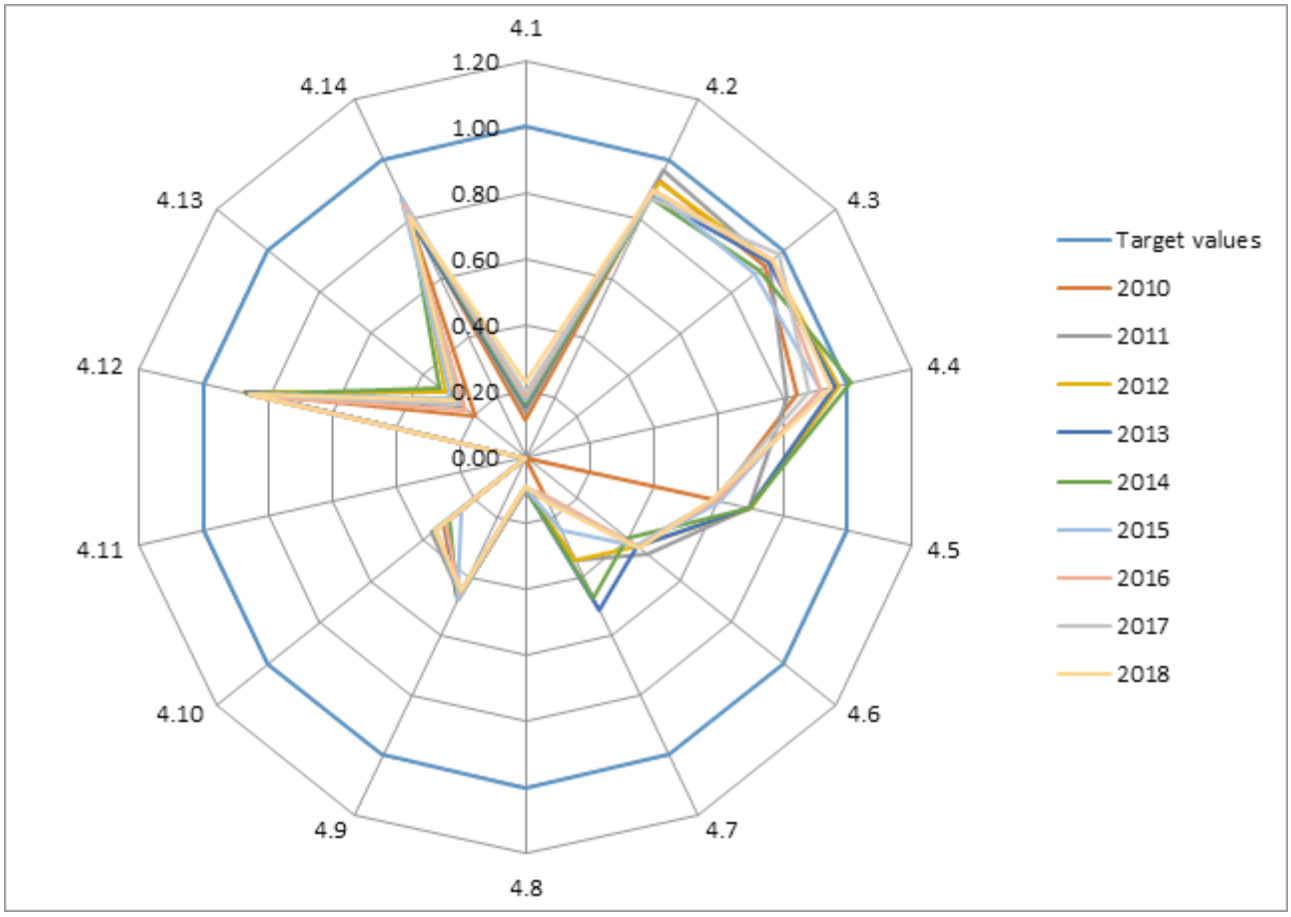

Fig. 4. **Diagram of the indicators of the political, economic and social components of the BSI investment policy of the Republic of Komi for 2011–2018**

Source: Compiled by the authors.

Note: the order of indicators corresponds to the BSI nomenclature for the political, economic and social component (*Fig. 1*).

to the long-term economic specialization; development of tourism, which has not only direct but also indirect (through multiplier effect in related industries) positive impact on the economy of the Republic of Komi; development of transport infrastructure and on this basis development of such industries as transportation and storage; implementation of a set of measures to support small business on the basis of the development of market economy institutions; introduction of innovations on this basis the development of export-oriented industries.

CONCLUSION

The use of the balanced scorecard model will make it possible to implement sustainable management of investment processes, increase the investment attractiveness of implemented projects. BCS can identify and present best regional practices to improve investment attractiveness.

The main result of the study is the development and scientific substantiation of the economic model of assessment of the balance of investment policies based on the BSC, which will give the opportunity to identify real measures to increase the investment attractiveness of the Russian subjects.

The novelty of the research consists in the proposed method of balanced assessment of the investment activities of regions of the Russian Federation, allowing to take into account the objectives of the investment process participants, developed an original balanced scorecard. Expediency of use of

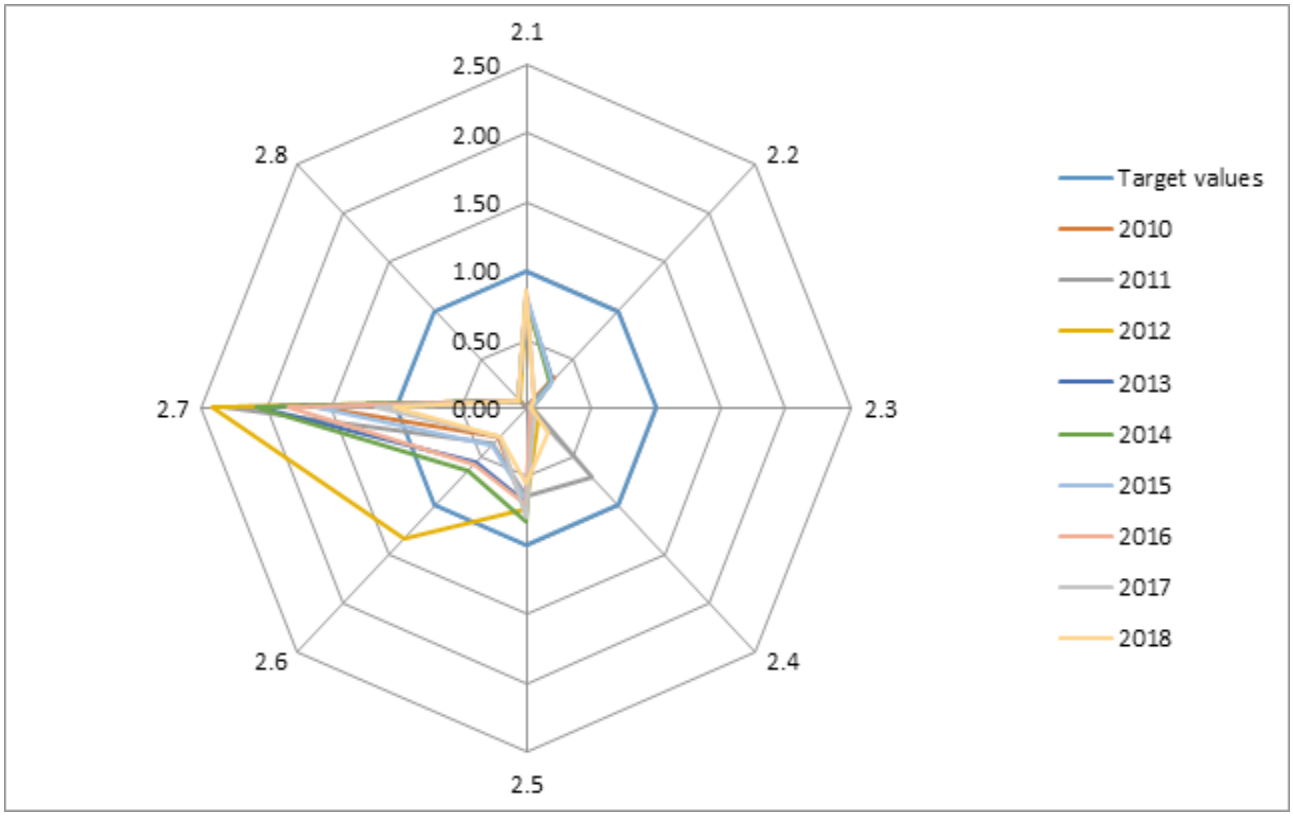

Fig. 5. **Diagram of the indicators of the BSI investment policy development of the Republic of Komi for 2011–2018**

Source: Compiled by the authors.

Note: The order of indicators corresponds to the BSI nomenclature for the development component (*Fig. 1*).

the proposed methodology for assessment of investment attractiveness and efficiency of investment policy by regional authorities of regions of the Russian Federation was substantiated. The obtained results confirm: implementation of the investment potential of AZ regions limits the imbalance of certain directions of regional investment policy, identified on the basis of the developed BSC.

Significantly increases the scope of application of the proposed methodology the possibility of its reproduction in different socio-economic conditions. The perspective direction of the research is the improvement of the BSC structure in the formation of the social market economy of Russia. The conducted research contributes to the theory of investment in the formation of new theoretical and methodological approaches to the management of regional investment processes on the basis of the concept of a balanced scorecard.

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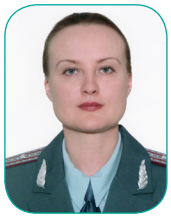

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Authors' declared contribution:
V.N. Myakshin — article development, data analysis, interpretation of the results.
V.N. Petrov — statement of the problem, conclusions and writing recommendations, abstract.
T.N. Pesyakova — literature review, interpretation of the results.

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