



Calculation of Indicators of Investment Attractiveness of the Region

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ABSTRACT: The achievement of investment security is possible only with a well-organized system of its management, including such blocks as organizational, resource, regulatory and methodological, with specification of the authorized executives and strict observance of the management stages. The purpose of the paper is to study the essential features and the methodology of assessing the region's investment security.

According to the stated purpose, the following tasks were set in the paper: to reveal the essence of the region's investment security; to identify the factors of the region's investment security; to form a system of indicators for assessing the region's investment security.

Obtained results. A list of indicators for an integrated assessment of the region's investment security was developed and systematized.

Keywords: Investment security of the region, management mechanism, public administration, investment, innovation, economic growth.

I. INTRODUCTION

The achievement of investment security is possible only with a well-organized system of its management, including such blocks as organizational, resource, regulatory and methodological, with specification of the authorized executives and strict observance of the management stages.

Therefore, the relevance of the research lies in the need to create a high-quality system for managing the region's investment security when determining the level of the objects' deterioration of technological equipment and disproportionate development of the regions in the country.

II. METHODS

The article uses the methods of analysis, synthesis,

induction and deduction. This paper considers the methodology for assessing the region's investment security.

Many scientists [1-9] were engaged in studies in the field of regional economics and economic security. At the same time, the problems of managing investment security at the regional level are studied insufficiently. The methodology for assessing the region's investment security and the mechanism for managing it is absent. Therefore, it is necessary to develop the theoretical foundations and methods for creating a system for ensuring the region's investment security.

The understanding of the essence of investment security should be the basis of all studies on this topic. Table 1 presents the definitions of investment security proposed by researchers.

Table 1: Approaches to the definition of the essence of investment security.

| Author | Definition |
|----------------|---|
| M.V. Alikaeva | "... such a state of the investment sphere, when the economy is able to maintain and sustain the level of investment resources necessary to ensure sustainable development and social and economic stability of an economic entity, as well as preservation of the potentials and integrity of investment infrastructure under the conditions of internal and external threats" [10]. |
| A.A. Ermak | "... such a balanced level (volume) of own and foreign investments, which will become the basis for the long-term positive dynamics of the economy; will be able to provide an adequate level of financing the scientific and technical base; will create and develop innovative processes and mechanisms. That is, investment security is both the state at which the economy is and the process that characterizes the utilization efficiency of capital investments" [11]. |
| E.V. Karanina | "... the achievement of such an investment level that allows optimal meeting the current needs of the economy for capital investments in terms of volume and structure considering the effective use and return of funds that are invested, the optimal ratio between the volume of foreign investment in the country and domestic investments ordered abroad, maintaining a positive national balance of payments" [12]. |
| A.A. Kuklin | "... ensuring such a state of the investment sphere, at which the regional economy is able to maintain and sustain the necessary level of investment resources under the conditions of threats activity to ensure sustainable development and social and economic stability of the region, as well as preservation of the potentials and integrity of investment infrastructure" [13, p. 4-5]. |
| M.V. Kuznetsov | "... such a level of correlation between the value of a country's investment abroad and the investments received, which meets the needs of the domestic economy and maintains a positive balance of payments" [14]. |

| | |
|----------------------------------|---|
| A.V. Kuchumov | "... such a condition at which the terms for the protection of investment resources channeled into the Russian economy are created" [15]. |
| S.E. Naryshkin | "...an ability of the national economic system to generate an investment process that maintains the sustainable growth and strategic competitiveness of the economy. The investment security policy can be implemented in three areas: ensuring the general investment sufficiency for the sustainable development of the economy; optimizing the investments' sectorial and territorial structure; building the investment process and all implemented investment projects with innovative content" [16]. |
| L.S. Orlov | "...an ability of the national economic system to self-reproduce the investment process in an efficient way, mostly referring to the maintenance of the country's competitiveness in the world community" [17]. |
| D.E. Petushenko | "... such a state of the investment processes in the country that would ensure the progressive development of the country's economy and the improvement of the social and economic sphere indicators" [18]. |
| V.K. Senchagov | "... is considered as a subsystem of economic security. It provides economically safe renewal and reproduction of fixed capital and intellectual human capital with a focus on the growth of economic results, on improving the production efficiency, the quality of goods and services produced and the living standards of the population" [19]. |
| O.V. Fedonina | "... such a state of all investment system institutions, which ensures the guaranteed protection and socially-oriented sustainable development of the economic system and the complex of financial relations and processes in the country" [20]. |
| A.S. Filatova | "...an ability of the national economic system to influence the investment process and to influence the strengthening of the strategic competitiveness of the economy and its sustainable growth" [21]. |
| A. Kharlamova | considers the concept of "investment security" from two positions: — in a broad sense, defining it as a level of opportunities for attracting the investments and, at the same time, as a level of state social and economic development under the influence of investment inflows; — in a narrow sense, as objectively existing features of an object (country, region, industry), which will help it to compete with other similar objects (investments' "hunters") based on the availability of economic, social and other objective conditions important for the investment activity of this object [22]. |
| E.Yu. Khirevich, S. V. Shveitser | "... is one of the economic security components and determines the ways and methods of preventing investment risks and creating a favorable investment climate" [23]. |

Source: compiled by the authors

Each of the definitions given above discloses some part of the investment security. For this reason, the following characteristics of investment security can be distinguished:

- acts as a subsystem of economic security;
- satisfies the current needs of the economy in capital investments;
- maintains an optimal ratio between the volume of foreign investments into the country and domestic investments ordered abroad;
- provides stable extended reproduction;
- protects the investment resources channeled into the economy;
- optimizes the sectorial and territorial investment structure;
- adds the innovative content to the investment process;
- aimed at improving the production efficiency, the quality of goods and services produced and the living standards of the population;
- prevents investment risks and creates a favorable investment climate;
- supports the country's competitiveness in the global community.

Thus, the investment security is a subsystem of economic security which is expressed by the presence of stable investment process, the sufficiency of investment resources for ensuring the expanded reproduction, innovations introduction and a high level of investments efficiency and protection. This subsystem has the optimal ratio between the volume of foreign investments in the country and domestic investments ordered abroad, preventing the investment risks and threats in the present and future periods and creating the favorable investment climate in the country.

The region's investment security is a part of the country's investment security. According to A.I. Vostrentsov, the region's investment security is "a process of importing and exporting investments that affect and influence both positively and negatively the economic security of the region's territory" [24].

The aforementioned definition describes the investment process itself rather than investment security.

N.M. Zakhvatova specifies the concept of regional investment security "as a subsystem of economic security which ensures the prevention of threats and the possibility of effective investment for the sustainable development of regional economies" [25].

The region's investment security lies as well in the "ability of state authorities in the region to influence directly the investment processes developing in the region, which determine the competitiveness and the sustainable growth of the region and the national economic system" [26].

However, not only public authorities affect investment security but all investment entities should take an active part in the investment process. Public authorities can only create favorable conditions for investment and exercise control over the movement of investments.

Thus, the region's investment security is a subsystem of the region's economic security, which is characterized by an active and sustainable investment process, maximum use of the territory's investment potential, favorable investment climate. The subsystem has the ability to prevent threats to effective investment and aims at the stable development of the region's economy.

The object of investment security is the region, the subjects are the investors, investment intermediaries and where the investments are directed to.

The region's investment security affects the economic system of the state and, on the contrary, the latter determines the investment climate of the region.

It is the regional policy that should be a tool for solving several interrelated tasks: attracting investments to ensure the social and economic development of a specific region (by providing regional benefits, by creating free economic zones, etc.); adjusting the federal policy in this area considering the regional specifics; collecting and analyzing the information necessary for evaluating the effectiveness of investment processes and activities of enterprises with foreign investments.

The interrelation of investment security with the

economic growth of the state is observed in many definitions of the analyzed concept. This is due to the fact that investments are directed at expanding the production, at developing new technologies, know-how, updating fixed assets, creating new enterprises, etc. The higher the investment activity is, which depends on investment security, the more stable is the economic growth of the region and on a nationwide scale.

The investment security is especially important for the regions, as it is based on the stability of the investment mechanism which allows to use the multiplicative factor of the regional economy development through activating the investment activity in the real economy sector. This ensures thereby the economic security of the sustainable development of the regional economic system and the conditions of keeping the social and political stability of the entire Russian Federation [27].

The investment mechanism is represented as an overall relationships system for attracting and implementing investments. The investment mechanism combines the relations between accumulation and consumption, investment in real and financial assets, costs and return on investment. The investment mechanism that generates the growth of the production factors eventually determines the level of the region's economic development and with effective public administration

ensures the elimination of threats to the economic security at the regional level [20].

The system of providing investment security of the region is a complex of organizations and institutions that implement a range of measures and determine the mechanism for controlling the investment activity at the regional level and identify, neutralize and prevent the negative impact of foreign capital on the economy as well [27]. At the same time, decision-making in the field of the region's investment security requires an analysis of the factors and threats to investment security, as well as the use of a system of corresponding indicators.

III. RESULTS AND DISCUSSION

Factors of the region's investment security

Investment security is influenced by such factors as the level of the population motivation, the degree of investors' awareness, their fair behavior, the prospect of insuring against investment risks, the volatility in the exchange rate, the amortization policy and the state investment policy.

Most often the factors of investment security are divided into positive and destructive.

The factors of investment security are presented in Fig. 1.

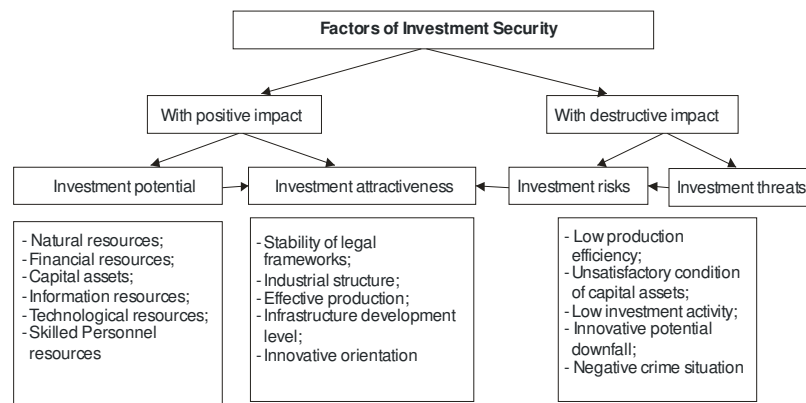


Fig. 1. Factors affecting investment security [28].

The factors of investment security with a positive impact include investment potential and investment attractiveness. In this case, the first factor affects the second one.

The investment potential of a region is a combination of own and resources attracted to the region, which are the prerequisites for investing. Investment potential has a positive impact on the investment climate and is used for the purposes determined by the region's social and economic policies.

The investment attractiveness of a region is a combination of favorable factors for investment activity which characterize the region's investment climate and distinguish this region from others. The investment attractiveness of a region is determined by its investment potential and investment risk [29].

Investment security threats are events that may occur in the future and may have a negative impact on the region's investment security.

The threats to the region's investment security are presented in Fig. 2.

The threats to investment security can be internal and external. Internal threats are those that occur in the region itself, and they are usually manageable. External

threats to investment security are those that may occur within a country or on the global stage and adversely affect the investment processes of the region.

The positive factors of investment security of the region (by the example of the Republic of Crimea) include:

- economic and geographical position with access to seas;
- introduction of a free economic zone;
- availability of agroclimatic resources;
- availability of resort, tourist and recreational resources;
- availability of agro-industry, shipbuilding and chemical industry;
- presence of deposits of mining and chemical raw materials, natural gas and building materials;
- peaceful situation in a multi-national society.

The destructive factors of investment security of the Republic of Crimea are:

- lack of water resources;
- introduction of economic sanctions;
- low investment activity level of the Crimean enterprises;
- high cost of capital raised;
- low level of innovative activity;

- high depreciation of fixed assets; enterprises.
- large-scale shadow economy;
- seasonality of operation mode of the resort service

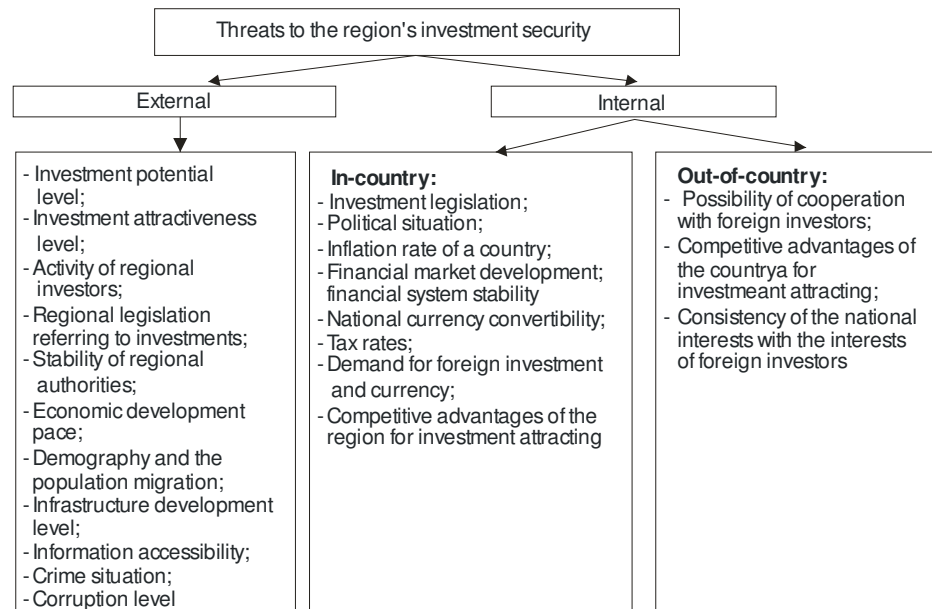


Fig. 2. Threats to the region's investment security.

System of indicators for assessing the region's investment security

To assess the level of region's investment security we took the indicators of investment threats, which are the ultimate indicators of investment activity. These indicators reflect the influence of factors, primarily economic.

The implementation of the analysis of the region's investment security is extremely topical, which implies the following stages:

- detecting the threats to the region's investment security, the classification of these threats;
- creating set of indicators that are necessary for the diagnostic assessment of the region's investment security;
- forming groups of indices (indicators) of investment security;
- conducting the analysis by each group of indices of investment security;
- conducting the analysis of the situational center of the region's investment security in generalization, analyzing the obtained results of the region's investment security.

The use of the indicative method for the development of a security assessment methodology involves consistent implementation of the following procedures:

- formation of system of security indicators;
- justification of their threshold values;
- establishment of rules for calculating the integral

security indicator.

When performing the first of the above-mentioned procedures, it is necessary to comply with certain requirements set for the system of security indicators. These requirements are as follows.

First, security indicators should provide a full and comprehensive specification of the state and functioning of the observed object. In this paper, the investment field of the region serves as the observed object.

Second, security indicators must meet the requirements of consistency. This means that all indicators used to assess investment security should be interconnected and interdependent. "The calculation of indicators, considered in isolation from each other, does not allow reaching their threshold values, they can be objectively assessed only in the system" [30].

Third, security indicators must be quantifiable, otherwise, it is impossible to develop threshold values for them.

Fourth, security indicators should be highly sensitive to negative phenomena and processes that can cause damage to the observed object. Only in this case, security indicators can fulfill their main purpose – to signal threats in time.

Fifth, security indicators should be compatible with the system of indicators used in statistical accounting. Otherwise, it will be impossible to possess the necessary data for their calculation, monitoring and forecasting [30].

The groups of indices (indicators) presented in Fig. 3 are used for determining the region's investment security.

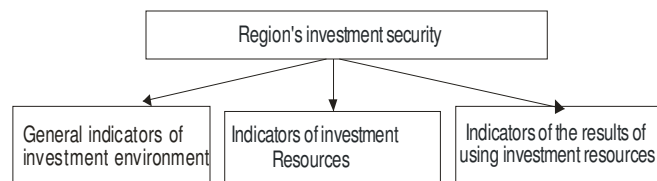


Fig. 3. Groups of indicators for the region's investment security.

Thus, all indicators of the region's investment security were divided into three groups. The first group characterizes the investment climate of the region, the second – the investment potential and the third – the

utilization efficiency of investment resources. Based on the available statistical information, the first group includes the indicators reflected in Table 2 [24].

Table 2: General indicators of the region's investment environment.

| No. | Indicator name | Calculation formula | Standard |
|-----|---|--|------------------------------------|
| 1. | Gross regional product | Statistical data | Average value for analyzed periods |
| 2. | Volume of gross regional product per capita | $\frac{\text{GRP}}{\text{Population}}$ | |
| 3. | Ratio of government debt volume to GRP | $\frac{\text{Government debt}}{\text{GRP}} \times 100$ | |
| 4. | Amount of crime per 100.0 thousand people | $\frac{\text{Amount of crime}}{\text{Population}} \times 100000$ | |

* Gross regional product – GRP (Source: compiled by the authors based on [31]).

Gross regional product (GRP) is a generalized indicator of the region's economic activity, characterizing the process of goods and services production. This is the main indicator reflecting the level of economic development in the region. The GRP volume increases when the investment in the region increases and vice versa. Therefore, at determining investment security, it is also important to assess the overall macroeconomic situation in the region which determines the investment climate in general.

GRP can be low and high, but to assess it by the volume is hardly achievable, since the territories of the regions can be different and the inhabitants number also differs. Therefore, the indicator of the GRP volume per capita is important. The higher this indicator is the higher is the efficiency of the region's economy.

The ratio of government debt to GRP determines for territorial authorities the possibility of repaying payments

for servicing government debt at the expense of the produced regional product of a given year, and in this capacity reflects the aspect of the general economic liquidity of the constituent entity of the Federation. When a certain level of government debt service payments is achieved in relation to GRP, the Federation subject loses the possibility of further economic growth, which also affects the deterioration of the region's investment security.

The last indicator in the first group is the number of crimes per 100.0 thousand people. This indicator affects the overall investment attractiveness for potential investors, it improves or worsens their will to invest in the region, without losing financial resources due to financial fraud.

The indicators of investment resources are presented in Table 3.

Table 3: Indicators of the region's investment resources.

| No. | Indicator name | Calculation formula | Standard |
|-----|---|---|------------------------------------|
| 1. | Investments in capital assets, mln.RUB. | Statistical data | Average value for analyzed periods |
| 2. | Investments in capital assets to GRP, % | $\frac{\text{Investment in capital assets}}{\text{GRP}} \times 100$ | 25 |
| 3. | Volume of investment in capital assets per capita, rub. | $\frac{\text{Investment in capital assets}}{\text{Population}}$ | Average value for analyzed periods |
| 4. | Coefficient of investment at the expense of own funds, % | $\frac{\text{Investment in capital assets (own expenses)}}{\text{Investment in capital assets}} \times 100$ | 37 |
| 5. | Share of investment in capital assets of the foreign form of ownership, % | $\frac{\text{Investment in capital assets of the foreign form of ownership}}{\text{Investment in capital assets}} \times 100$ | 20 |

Source: compiled by the authors based on [30-32].

The dynamics of investment in capital assets by year of research are one of the main indicators of investment security since an increase in investment volume indicates an improvement in the investment security of the region.

In order to assess the adequacy of investments in capital assets at the regional level, the share of investments in capital assets in the GRP is calculated. According to sources, this figure should be at least 25% [30-32].

The volume of investment in capital assets per capita is a relative indicator used to determine the level of social and economic development of the constituent entities of the Russian Federation. It reflects which volume of investment falls per one resident of a particular region.

The coefficient of investment at the expense of own funds reflects the region's own investment potential, the

volume of investments made without attracted funds. This is an important indicator of investment security since sources of investment are different, but the most reliable ones are own funds. The bigger the number of the latter, the higher the investment security is.

The investment share in capital assets to the foreign form of ownership. The region has enterprises both Russian-owned and foreign-owned, as well as with mixed form of ownership. Most enterprises invest in capital assets. Investments made by enterprises of the foreign form of ownership are mostly foreign. Thus, it is possible to calculate the approximate share of foreign investment in capital assets of the region.

The performance indicators of investment resources utilization are given in Table 4.

Table 4: Performance indicators of investment resources utilization in the region.

| No. | Indicator name | Calculation formula | Standard |
|-----|---|---|------------------------------------|
| 1. | Internal costs for scientific research, % to GRP | $\frac{\text{Internal costs on scientific research}}{\text{GRP}} \times 100$ | 2 |
| 2. | Commissioning of new capital assets, mln.rub. | Statistical data | Average value for analyzed periods |
| 3. | Share of commissioning new capital assets in the general flow of funds, % | $\frac{\text{New capital assets}}{\text{Flowof capital assets}} \times 100$ | |
| 4. | Coefficient of capital assets renewal | $\frac{\text{Cost of commissioned CA}}{\text{CA on the end of the period}}$ | 18 |
| 5. | Coefficient of capital assets disposal | $\frac{\text{Cost of disposed CA}}{\text{Ca on the beginning of the period}}$ | 5 |
| 6. | Coefficient of capital assets depreciation, %. | $\frac{\text{Amortizationamount}}{\text{CAinitialcost}} \times 100$ | 40 |
| 7. | Share of investment in the active part of capital assets in total amount, % | $\frac{\text{Investmentin machinery and equipment}}{\text{Investmentin capital assets}} \times 100$ | Average value for analyzed periods |

* Capital assets – CA

Source: compiled by the authors based on [30,33].

To define investment security, it is important to determine both the availability of investment resources and the effectiveness of their use for the regional economic development as well.

The first indicator of the result of investment resources utilization is the ratio of internal costs for scientific research to GRP. The greater this indicator is, the faster science develops, the inventions appear that can be used for improving production, that leads to economic growth, as well as to social development. Thus, by increasing this indicator, investment security of the region also improves.

Investments in capital assets are also directed to the creation, reconstruction and modernization of equipment that is directly involved in the production. Therefore, these investments should be sufficient which is reflected by indicator: commissioning of new capital assets.

In order to assess the adequacy of commissioning of the new capital assets, it is necessary to calculate the share of commissioning of the new capital assets in the general flow of capital assets. The latter also includes the flow of capital assets from other sources.

The investments in capital assets are directed to keeping the normal state of capital assets as well. These investments are very important, as they ensure the work of the company and bring the economic benefits. Reconstruction, technical reequipment, facilities capital repairs and replacement with more efficient and modern facilities occur with the help of such investments. This process is called capital renewals. If an enterprise is focused on expanding capacity and production, it starts acquiring new capital assets, replenishing the existing assets. The indicator that fixes the flow and commissioning of acquired capital assets is the renewal coefficient.

The enterprise utilizes capital assets in the process of implementation the activities. These capital assets tend to depreciate and leave the register. A specific coefficient – the coefficient of capital assets disposal – is used for the analysis of the number of disposed capital assets. When the economy stagnates and the pace of innovation declines, the disposal indicator decreases, and when the economy recovers – the coefficient increases. In addition, this indicator may reflect the need for investment resources. The higher the disposal coefficient is, the more investment is needed to renew capital assets.

The conditional indicator that determines the assessment of condition of the enterprise capital assets

and carries an analytical value is called the coefficient of the capital assets depreciation. This indicator shows the rate of capital assets depreciation, not the extent of depreciation of capital assets. That is, it can be considered as, first, the need for investments in fixed assets by the regional enterprises, and second, as the availability of investment resources, because the accumulated amortization can act as an investment.

Capital assets include buildings, machinery, equipment, non-material assets, etc. However, machinery and equipment are directly involved in the production – that is, the active part of capital assets. They depreciate faster and demand renewal and modernization for keeping the enterprises competitive. For this reason, investments in this part of capital assets should be constant and sufficient, which can be estimated with the help of indicator: the share of investments in the active part of capital assets in an aggregate amount.

The mentioned indicators are partial list. However, based on the available data, such quantitative indicators are sufficient to assess the general level of investment security and to identify the threats to its reduction.

To calculate the integral indicator of the region's investment security, every indicator of investment security must be brought into a comparable form. To achieve this, it is necessary to compare the obtained numerical value of each indicator with its normative value, that is, to carry out standardization. The revaluation of the region's investment security indicators is carried out in the following sequence:

1. For each i indicator, its standard value is fixed a^{nl} .
2. The degree of the investment security indicator deviation from the normative (average regional) value is calculated:

$$x_{ij} = \frac{a_{ij}}{a_{ij}^{nl}}, \text{ if the indicator optimization direction is } \Rightarrow \text{max};$$

$$x_{ij} = \frac{a_{ij}^{nl}}{a_{ij}}, \text{ if the indicator optimization direction is } \Rightarrow \text{min};$$

The next step in assessing the region's investment security is the calculation of integral indicators for each group of indicators, as well as the calculation of the general integral indicator of investment security. Group

integral indicators are calculated by adding every indicator of the group. The general integral indicator is the sum of every value of group integral indicators [34].

IV. CONCLUSION

The region's investment security is a subsystem of the region's economic security, characterized by an active and sustainable investment process, maximum use of the territory's investment potential, favorable investment climate and the ability to prevent the threats for effective investment for the stable development of the region's economy.

The system of providing investment security of the region is a complex of organizations and institutions that implement a range of measures and determine the mechanism for controlling the investment activity at the regional level and identify, neutralize and prevent the negative impact of foreign capital on the economy as well.

The factors of investment security with a positive impact include investment potential and investment attractiveness. In this case, the first factor affects the second one. The factors of the region's investment security with a destructive impact – the threats to investment security – are the events that may occur in the future and adversely affect the region's investment security.

Analysis of the region's investment security includes: revealing (determining) threats to the region's investment security, forming a set of indicators required for diagnosing the region's investment security, forming groups of investment security indicators; completing the analysis for each group of indicators; monitoring the situation in general; conducting the analysis of the obtained results of assessing the state of the region's investment security.

Indicators of the region's investment security include:

- general indicators of the investment environment (GRP, GRP per capita, ratio of public debt to GRP, the number of crimes per 100.0 thousand people);
- indicators of investment resources (investments in capital assets, investments in capital assets for GRP, volume of investments in capital assets per capita, investment coefficient at the expense of own funds, share of investments in fixed capital of the foreign form of ownership);
- indicators of the results of utilization of investment resources (internal costs for scientific research to GRP, commissioning of new capital assets, share of commissioning of the new capital assets in the general flow of funds, coefficient of capital assets renewal, coefficient of capital assets disposal, coefficient of capital assets depreciation, share of investment in the active part of capital assets in the total amount).

We carry out standardization of the obtained numerical values for each indicator with its normative value.

Then, the calculation of the integral indicators for each group of indicators is completed, as well as the calculation of the general integral indicator of investment security.

Further research should be directed to approbation of obtained results when assessing the investment security of the region.

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