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# Assessment of development performance and investment climate of a region

## Evaluación del clima de desarrollo e inversión en la región.

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**ABSTRACT:**

The article presents a methodology for assessing indicators of development and the investment climate at the regional level, which is based on an approach that determines investment attractiveness as a combination of socio-political, natural-economic and psychological characteristics. the assessment methodology is carried out using the integral indicator of the reliability of the investment climate, for the evaluation of which a certain set of particular indicators is formed.
**Keywords:** region, investment, socio-economic system, innovation, investment potential, investment risks

**RESUMEN:**

El artículo presenta una metodología para evaluar el desarrollo y la inversión a nivel regional, que se basa en un enfoque que determina el atractivo de la inversión como un conjunto de características sociopolíticas, natural-económicas y psicológicas. La metodología de evaluación se lleva a cabo utilizando el indicador integral de la confiabilidad del clima de inversión, para cuya evaluación se forma un conjunto específico de indicadores específicos.
**Palabras clave:** Región, inversión, sistema socioeconómico, innovación, potencial de inversión, riesgos de inversión.

## 1. Statement of a problem

Assessment of investment climate of regions plays an important role for investment planning. Products and enterprises of the same industry (sub-industry) positioned in various regions, had very different attraction. It depends on such factors as location, development of transport network, characteristics of social conditions, infrastructure development, climatic conditions and availability of resources, etc. Analyzing a number of reseach studies conducted by brightest minds of domestic and foreign economic schools, it can be stated with confidence that for the stable development of the territory it is necessary to stimulate the growth of economic and investment attractiveness.

# 2. Analysis of recent publications

Consider the existing approaches to the analysis of investment attractiveness of the region. There are criteria that are used in domestic scientific research to assess the investment attractiveness of the country. For this purpose we use the classification given by N. In. Igoshin and there are three main approaches:

- narrowed approach: based on the assessment of GDP dynamics, national income and economic output, proportions of rate of accumulation and consumption, state of the legislative system, investment management, dynamics of investment markets and regional markets, including stock market etc.

-factor (advanced) approach based on the assessment of a set of factors affecting the investment attractiveness on the assessment of a combination of factors affecting on the investment attractiveness. Its particular feature is not formed the final list of factors;

-risk-based approach allows you to evaluate the attractiveness of the region for investment and compare the level of risk inherent in the new investment object with the existing one. Part of such approaches are two indicators: investment potential and investment risks. One approach evaluates the objective side of the process, i.e. the investment potential of the economic system, the other is informal factors of investment climate and risk.

It is interesting to note that both factor and risk approaches designed to determine the indicators of economic and investment attractiveness have a common analytical and mathematical tools. At the same time, almost all existing approaches to assessing the investment attractiveness of regions are characterized by the use of a variety of economic and statistical methods. The vast majority of the authors of these methods resort to the construction of integrated indicators to determine the investment conditions of the economic system and subsequent meaningful interpretations and recommendations.

The rating of economic and investment attractiveness of the state is a determining indicator for creditors and potential investors, but only in the format of direct investment financing its analyst is not required. The fall of positions in the rating is a kind of image of the threat of loss of investment attractiveness, because for professional investors the level of risk is most indicative in the formation of sound management decisions in the field of regional development.

Research has shown that the rating approach is quite effective, especially at the international level. However, it is possible and promising to apply this framework at the national and regional level.

Concerning the use of national rating agencies (NRA) there are studies Gutman G. V., Zvyagintsev O. P., A. A. Miroedova.

Assessment of the economic and investment climate in the country and its regions is considered in a number of scientific studies quite extensively and market adequately, therefore, we note that there are several methodological approaches that accordingly use the appropriate instrumentation.

Active development in our country of methods for assessing the socio-economic development of the regions began in the early 90-ies, with the main purpose of socio-economic research for making optimal management decisions was the monitoring of information about the studied object.

The main priority in the development, adaptation and implementation of methods is interregional comparative analysis of investment attractiveness.

The most widespread approach is the one that determines the investment attractiveness as a set of socio-political, natural, economic and psychological characteristics. In this direction, the method of assessment is carried out using an integral indicator of the reliability of the investment climate, for the assessment of which a certain set of private indicators is formed. The value of K is between 0 and 10. The higher the value of the integral indicator of reliability of the investment climate, the more favorable the climate has the region. This technique has such disadvantages as the vagueness of the assessment of the components of indicators and the ambiguity of the estimated characteristics. The integral indicator (K) of an

assessment of a condition of investment climate is calculated as the weighted average arithmetic value of values of private indicators(A. A. Spesivtseva,2011):

$$K = \frac{K_1 \cdot l_1 + K_2 \cdot l_2 + ... + K_n \cdot l_n}{\sum\limits_{i=1}^{n} l_i}, \qquad (1)$$

$K_1, K_2, ... K_n$ - private indicators, namely: financial, economic, political;

$l_1, l_2, ... l_n$ - weights of particular indicators;

In this research perspective, the investment climate assessment tools represent a methodology that includes the economic basis and risk indicators:

$$K = k_1 \times (1 - k_2), \qquad (2)$$

K- indicator of investment attractiveness of the region, in shares of unit;

$k_1$ - the economic component, in shares of unit;

$k_2$ – the risk component, in shares of unit. The economic component is the ratio of return on investment to invested funds:

$$k_1 = (BP\Pi \times (1 - Д) \times (1 - T) - И)/И, \qquad (3)$$

ВРП – gross regional product,

Д-budget deficit, in shares of unit (ratio of state budget deficit to GRP);

T-average tax rate;

И– The volume of investment.

The risk component is necessary to assess the level of total risk, calculated by the following formula:

$$k_2 = \frac{\sum\limits_{i=1}^{n} P_i \times j_i}{\sum\limits_{i=1}^{n} j_i}, \qquad (4)$$

n - number of indicators;

$p_i$-characteristic of the indicator;

$j_i$-weight of the indicator".

It should be noted that this technique combines in its research Arsenal qualitative and quantitative indicators, the totality of which varies depending on the volume of investment in fixed assets, as indicators of investment activity in the region. With the help of correlation and regression analysis, a clear link is established between the volume of financial investments and indicators of investment attractiveness.

To compare quantitative and qualitative indicators and use them in further calculations, a point scale is used, according to which each indicator is assigned a weight coefficient based on the priority method.

Regions depending on the value of the investment attractiveness index are classified as follows:

K > 0,4 – high investment attractiveness;

0,2 < K < 0,4- investment attractiveness above average;

0,1 < K < 0,2- average investment attractiveness;

0,05 < K < 0,1- below average investment attractiveness;

K < 0,05 – low investment attractiveness.

In our opinion, in such a research, the most important role should be played by regional agencies and authorities, providing Federal agencies and Rosstat with data reflecting the validity of all necessary indicators. Often this point is missed, and the ranks occupied in the ranking do not correspond to reality.

The most important task in identifying the characteristics of the region's investment climate in our study is not only considering the investment potential of a region that is sufficient in the Russian Federation, but also identifying the real level of investment risk, often associated with a fairly subjective assessment. Therefore, we calculated the investment risk for the North Caucasus Federal District using the following methods:

- calculation of investment risk based on the rate of return;

- assessment using the VaR delta model - the normal method;

- a comprehensive indicator for assessing the investment risk of a region.

It should be noted that a number of different factors influence a positive investment result. Therefore, in order to make a decision, an investor first needs to conduct a comprehensive assessment of the investment object, in this case, the Chechen Republic, which would allow to draw correct conclusions about the level of investment threats in the region.

This indicator is determined by the ratio of the gross regional product (GRP) to the volume of investment, and is an indicator of profitability in assessing the investment risk of the region. We calculate the return on investment indicators, the standard deviation (as a measure of investment risk), and the coefficient of variation for the North Caucasus Federal District.

**Table 1**
Estimation of regional investment risk in terms of investment returns
for the regions of the North Caucasus Federal District, 2014 - 2016.

| Region | Indicator | | |
| --- | --- | --- | --- |
| | Return on investment, average value, million rubles | Standard deviation million rubles. | Coefficient of variation % |
| The Republic of Dagestan | 2,111 | 0,096 | 4,172 |
| The Republic of Ingushetia | 2,693 | 0,100 | 3,455 |
| Kabardino-Balkaria | 4,043 | 0,337 | 7,149 |
| Karachay-Cherkess Republic | 2,999 | 0,661 | 15,305 |
| Republic of North Ossetia - Alania | 3,873 | 0,389 | 8,361 |
| Chechen Republic | 1,195 | 0,216 | 13,299 |
| Stavropol region | 3,319 | 0,104 | 3,351 |

On the basis of the calculations it can be noted that the Karachay-Cherkess Republic has the

greatest investment risk, and the Chechen Republic among the regions of the North Caucasus Federal district ranks fourth with the lowest level of return on investment among the regions of the North Caucasus Federal district.

It is also necessary to present and analyze an alternative method of risk assessment used by domestic and foreign authors-the VaR model. On the basis of this method, it can be argued with a probability of 95 % (99 %) that the loss from investing in the n-th region will not exceed VaR percent. The advantage of this method is the simplicity of calculations and clarity.

**Table 2**
Estimation of regional investment risk based on the VaR model for
the regions of the North Caucasus Federal District, 2014–2016.

| Region | VaR for confidence intervals | |
|---|---|---|
| | 95 % | 99% |
| The Republic of Dagestan | 0,44 | 0,62 |
| The Republic of Ingushetia | 0,38 | 0,54 |
| Kabardino-Balkaria | 1,67 | 2,27 |
| Karachay-Cherkess Republic | 5,15 | 7,27 |
| Republic of North Ossetia - Alania | 2,77 | 3,92 |
| Chechen Republic | 1,66 | 2,35 |
| Stavropol region | 0,28 | 0,40 |

The information from table 2 illustrates that the greatest investment risk is observed in the Karachay-Cherkess Republic.

It should be noted that when comparing the results obtained on the basis of the calculation of the investment risk of the regions of the North Caucasus Federal District by both methods, the Chechen Republic takes a stable fourth place. According to the data obtained, it can be concluded that the Chechen Republic is not the last in terms of investment risk, calculated according to the method of calculating the investment attractiveness of Russian regions by the rating agency EXPERT RA, the data of which are currently the leading and most frequently used by potential investors.

Emphasizing the importance of economic and investment attractiveness and evaluation of investment risk, it is necessary to note a number of problems associated with quantitative estimates. In particular, there are no uniform approaches to investment risk assessment methodology. As part of the study, we are interested in the regional investment risk of the Chechen Republic.

**Table 3**
Characteristics of the integral indicator of the investment risk of the region,%

| Indicator | Criterion | Points |
|---|---|---|
| Dynamics of GRP per capita | Up to 100 | 0 |
| | 100-110 | 1 |

| | | |
|---|---|---|
| | 110-120 | 2 |
| | 120-130 | 3 |
| | 130-140 | 4 |
| | Over 140 | 5 |
| Dynamics of investments from all sources of financing | 100 | 0 |
| | 100-110 | 1 |
| | 110-120 | 2 |
| | 120-130 | 3 |
| | 130-140 | 4 |
| | Over 140 | 5 |
| Debt on loans, rubles | Over 150 | 0 |
| | 150-130 | 1-2 |
| | 130-100 | 3-4 |
| | below 100 | 5 |
| The ratio of per capita income and the subsistence minimum | Up to 100 | 1 |
| | 100-150 | 2-3 |
| | 150-200 | 3-4 |
| | More than 200 | 5 |
| The ratio of the cost of construction of 1 square meter of housing to its average market prices | Over 70 | 0 |
| | 70-50 | 1-2 |
| | 50-30 | 3-4 |
| | Below 30 | 5 |
| Autonomy ratio,% | Up to 30 | 1 |
| | 30-40 | 2-3 |
| | 40-50 | 3-4 |
| | Over 50 | 5 |
| Administrative risks and other risks | High risk (10-6%) | 0-1 |
| | Medium risk (6-3%) | 2-4 |
| | The risk is low (below 3%) | 5 |

Algorithm for calculating investment risk:

1. Formed a system of indicators reflecting the investment climate in the region;

2. Each indicator is estimated in the range from 0 to 5 points. Criteria determined on the basis of regional indicators statistics (the criteria are determined by the author, based on the current statistical situation in the regions);

3. As a result, the points are summed up, and the overall result can vary in the range from 0 to 35 points, and acts as an indicator of the corresponding level of risk.

Based on the built algorithm, we calculate the investment risk of the region in the form of a scoring.

# 3. Research objective

We have analyzed information regarding the regions of the North Caucasus Federal District. The obtained calculations of the investment risk of the regions showed that there is an active dynamics of reducing the investment risk in 2014-2016. in the Chechen Republic compared with the previous period. Moreover, this reduction significantly.

Of all the components of investment risk, the most risky factors are loans in rubles and the ratio of construction costs to Q1. meter of housing to its market price.

The structural impact of the most economically significant indicators - the dynamics of the gross regional product per capita and the dynamics of investments - varies from year to year for each region in different ways.

Thus, according to the method chosen by the author, the investment attractiveness of the Chechen Republic looks positive and shows that the investment policy of the region should be based on the development of the main components of its investment attractiveness, taking into account the investment risk of the region.

**Table 4**
Dynamics of investment risk of the Chechen Republic

|  | 2014 | | 2015 | | 2016 | |
|---|---|---|---|---|---|---|
|  | **%** | **Points** | **%** | **Points** | **%** | **Points** |
| Dynamics of GRP per capita | 138,7 | 4 | 134,8 | 4 | 94,8 | 0 |
| Dynamics of investments from all sources of financing | 182,7 | 5 | 82,4 | 0 | 94,9 | 0 |
| Debt on loans, in rubles | 449 | 0 | 95,5 | 5 | 115,5 | 4 |
| The ratio of per capita income and the subsistence minimum | 54 | 1 | 102,6 | 2 | 86,4 | 1 |
| The ratio of the cost of construction of 1 square meter of housing to its average market prices | 47 | 3 | 55 | 2 | 69 | 1 |
| Autonomy ratio,% | 4,99 | 1 | 7,15 | 1 | 10,70 | 1 |
| Administrative risks and other risks | 8 | 1 | 2 | 5 | 2 | 5 |
| Total score |  | 15 |  | 19 |  | 12 |

# 4. Conclusions

Summing up, it can be noted that the definition and use of the specific methodology in the future is revealed by a set of indicators affecting investment attractiveness.

The negative aspects of research on the economic and investment attractiveness of the subjects of the federation can be represented as follows:

1. Differences in the understanding of the category of investment climate.

2. The limitations of the complex of indicators taken into account.

3. Insufficient validity of the aggregation criteria in the proportion of assessment indicators.

4. Periodic or episodic research, as one-time studies of various teams, conducted on a

different date.

It should be noted that the effectiveness of the application of a particular technique will manifest itself only when there is an opportunity in the current mode (on-line) to assess the investment attractiveness of a region with the possibility of comparing the integral criteria with other regions of Russia, monitoring the dynamics of the integral indicator of the investment attractiveness of the estimated region.

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