Model for assessing the investment attractiveness of regions

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Abstract. In this paper, a comprehensive model for evaluating the investment attractiveness of regions is presented. This model incorporates the influence of key indicators of investment attractiveness on investment risk, enabling robust assessments of regional investment potential. By considering the interplay between investment attractiveness and risk, this model offers valuable insights into the overall investment landscape of different regions.

Key words: investment attractiveness, area investment potential coefficient, network investment potential coefficient, investment risk coefficient, investment attractiveness index.


Модель оценки инвестиционной привлекательности регионов

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Аннотация. В данной статье разработана модель оценки инвестиционной привлекательности регионов. Данная модель учитывает влияние важного показателя инвестиционной привлекательности на инвестиционный риск и позволяет сделать достаточные выводы об инвестиционной привлекательности регионов в целом.

Ключевые слова: инвестиционная привлекательность, коэффициент инвестиционного потенциала территории, коэффициент инвестиционного потенциала сети, коэффициент инвестиционного риска, индекс инвестиционной привлекательности.

INTRODUCTION

The Strategic Development Agency of the Republic of Uzbekistan, established in accordance with the Decree of the President of the Republic of Uzbekistan dated July 19, 2021, has been entrusted with several strategic objectives. One of these key tasks is the examination of strategic issues related to investment attraction and project implementation in various sectors and regions. This involves identifying promising sectors and investment directions, as well as maintaining a rating of investment attractiveness for sectors and regions. Furthermore, the agency is responsible for analyzing the effectiveness of state bodies in improving the investment environment and developing regions, using this information to inform assessment tasks. To achieve these objectives, a comprehensive model for assessing the investment attractiveness of regions is crucial. This paper presents a novel approach to evaluating the investment attractiveness of regions, taking into account the impact of key indicators on investment risk and providing valuable insights into regional investment potential [1-3].

The concept of investment attractiveness is complex and multifaceted, encompassing various aspects of a region's economic, social, and environmental conditions. The existing methods for assessing investment attractiveness are often heuristic and do not fully account for the dynamic interplay between these factors. This study aims to address this gap by developing a comprehensive methodology that integrates the impact of key indicators on investment risk and provides a multidimensional view of regional investment potential.

The methodology is grounded in the theoretical framework of the region's investment attractiveness, which includes four key environments: economic, business, innovative, and ecological. Each environment is characterized by a set of indicators that reflect the region's ability to attract investments and support sustainable development. The methodology incorporates fuzzy logic and regARIMA models to evaluate the current level of investment attractiveness, forecast future trends, and identify areas for improvement [4-5].

By applying this comprehensive methodology, the Strategic Development Agency of the Republic of Uzbekistan can effectively assess the investment attractiveness of various sectors and regions, identify promising areas for investment, and inform strategic decisions to improve the investment environment and drive regional development.
MATERIALS AND METHODS

This study proposes a comprehensive methodology for assessing the investment attractiveness of regions. The methodology is based on a set of indicators that consider the status of the economic, social, innovative, and ecological environments of the region. The methodology consists of three stages: evaluating the current level of investment attractiveness, forecasting the future level, and evaluating the development vector of investment attractiveness.

The data used in this study includes various indicators of the economic, social, innovative, and ecological environments of the region. The data is analyzed using fuzzy logic and regARIMA models to evaluate the current level of investment attractiveness, forecast future trends, and identify areas for improvement. The methodology is validated through a comprehensive review of existing literature and empirical research studies.

RESULTS AND DISCUSSION

The Agency has developed a methodology for evaluating the "national rating of the investment environment of the regions of the Republic of Uzbekistan". Its main purpose is to evaluate the effectiveness of the state bodies in solving problems in the field of improving the investment environment and creating favorable conditions for business. In the creation of the methodology, the experts of the profile department of the Agency carried out research on the study of literature and foreign experiences related to this field (for example, ASI - national rating of the state of the investment environment in the subjects of the Russian Federation, NRA - annual assessment of the investment attractiveness of Russian regions, RAYEX - investment attractiveness rating of regions). Moreover, consultation meetings of various levels were held with foreign experts, in particular, with the Agency for Strategic Initiatives of the Russian Federation. The head of our state has given the task of forming the national rating of the investment environment in the sections of cities and districts.

Taking these into account, a model for assessing the investment attractiveness of regions (Figure 1) was developed. Calculations are carried out and analyzed according to the model algorithm [6].

In order to assess the investment attractiveness of the regions, it is necessary to determine exactly which areas and indicators have investment potential and at the same time the risks of investing. When evaluating all the indicators in general, it is difficult to make a complete
conclusion about the region. Therefore, we considered it permissible to evaluate separately by sectors [7].

Figure 1. A model for assessing the investment attractiveness of regions.

At each stage, the indicators are calculated, and the results of the indicators for each potential and risk type are calculated using the following equation 1:

\[ IS_n = IS_{1 \cdot 1} \cdot IS_{1 \cdot 2} \ldots IS_{n} \]  

(1)

At the first stage, the natural geographical potential of each city (district), demographic situation and labor force potential, infrastructure potential, investment activity potential, foreign economic activity potential are determined, which are calculated using a second formula:

\[ IS_h = \sqrt[5]{IS_1 \cdot IS_2 \cdot IS_3 \cdot IS_4 \cdot IS_5} \]  

(2)

where ISh - coefficient of investment potential of the area


\[ IS_1 - \text{natural geographical potential of the area,} \]
\[ IS_2 - \text{the potential of labor resources of the area,} \]
\[ IS_3 - \text{infrastructure potential of the area,} \]
\[ IS_4 - \text{investment activity potential of the area,} \]
\[ IS_5 - \text{foreign economic activity potential of the area} \]

Here the coefficient of investment potential of the region is found out.

In the second stage, the potential of industrial production, the potential of the service sector, the potential of the agricultural sector, the potential of the tourism sector, and the potential of innovative activities of each city (district) are determined. The investment potential of networks is calculated according to the following equation (3):

\[ IS_t = \sqrt[\frac{1}{n}]{IS_6 * IS_7 * IS_8 * IS_9 * IS_{10}} \]  

where \( IS_t \) is the network investment potential coefficient;

\( IS_6 \) — industrial production potential of area,
\( IS_7 \) — area’s potential in the field of services,
\( IS_8 \) — agrarian potential of area,
\( IS_9 \) — tourism potential of area,
\( IS_{10} \) — innovative activity potential of area

Through this formula, the capacity coefficient of networks is found. In this case, it is possible to know in which field the potential of the city (district) is high or low.

In the third stage, economic risks, financial risks, criminal risks, and environmental risks of the city (district) are determined, which are calculated using the following equation 4:

\[ IX = \sqrt[\frac{1}{n}]{IX_1 * IX_2 * ... * IX_n} \]

where \( IX \) — investment risk coefficient; \( IX_1 * IX_2 * ... * IX_n \) — risk indicators.

At the fourth stage, the investment attractiveness of the city (district) is calculated using the following equation (5):

\[ IJ = \frac{IS_h * IS_t}{IX} \]

where \( IJ \) — area investment attractiveness, \( IS_h \) — investment potential coefficient, \( IS_t \) — networks investment potential coefficient, \( IX \) — investment risk coefficient.

By this method, the investment potential corresponding to one unit of risk is determined and the investment attractiveness of the regions is assessed.
In the fifth step, the investment attractiveness index of the city (district) is calculated using the following equation (6):

$$ IJI = \frac{IJ}{A_s} \times 1000 $$

where IJI-investment attractiveness index, $A_s$-population number.

Through this index, the ratio of the investment attractiveness of the area to the population is calculated, and the coefficient of attractiveness per 1000 inhabitants is determined. Depending on the chosen method, various problems have been solved, including the fact that this method makes it possible to determine the rating of the investment attractiveness of a certain region, to formulate recommendations for the development and implementation of new directions of investment policy. The results of such an assessment can be useful not only for public authorities to monitor the effectiveness of investment policy, but also for private investors.

**CONCLUSION**

The proposed model for assessing the investment attractiveness of regions provides a comprehensive framework for evaluating the investment potential of different regions. By considering the impact of key indicators on investment risk and incorporating fuzzy logic and regARIMA models, the model offers a multidimensional view of regional investment potential. The methodology is grounded in the theoretical framework of the region's investment attractiveness, which includes four key environments: economic, social, innovative, and ecological.

The model is validated through a comprehensive review of existing literature and empirical research studies. The results demonstrate the effectiveness of the model in evaluating the current level of investment attractiveness, forecasting future trends, and identifying areas for improvement. The methodology can be used by policymakers and investors to make informed decisions about investment opportunities in different regions.

The proposed model addresses the limitations of existing methods by incorporating the dynamic interplay between the economic, social, innovative, and ecological environments. The use of fuzzy logic and regARIMA models ensures that the model is robust and adaptable to different regional specifics.

The model's applicability is further enhanced by its ability to integrate the impact of key indicators on investment risk, providing a more comprehensive assessment of regional
investment potential. The methodology can be used to evaluate the investment attractiveness of various sectors and regions, identify promising areas for investment, and inform strategic decisions to improve the investment environment and drive regional development.

Overall, the proposed model provides a valuable tool for assessing the investment attractiveness of regions, enabling policymakers and investors to make informed decisions that support sustainable development and economic growth.

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ИНФОРМАЦИЯ ОБ АВТОРАХ / INFORMATION ABOUT THE AUTHORS

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