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METHODS AND TOOLS FOR ANALYZING REGIONAL DIFFERENTIATION IN THE ATTRACTION OF FOREIGN DIRECT INVESTMENT (FDI)

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Abstract:

Foreign direct investment (FDI) plays a key role in the development of national and regional economies, contributing to technological modernization, employment growth, and integration into global markets. However, FDI inflows are unevenly distributed across a country, leading to regional differentiation. Analyzing this differentiation makes it possible to identify the factors of regional investment attractiveness, assess imbalances, and develop effective regional policies. The article examines modern methods and tools for analyzing the regional differentiation of foreign direct investment (FDI) attraction. It reveals the essence of the uneven distribution of investment flows across regions and identifies the key factors determining differences in their investment attractiveness.

Keywords: foreign direct investment (FDI), regional differentiation, investment attractiveness, econometric analysis, statistical methods, cluster analysis, geographic information systems (GIS), index approach, regional development, investment policy, spatial analysis, digitalization of the economy, big data, investment climate

INTRODUCTION. In the current conditions of the globalization of the world economy and the intensification of international competition for investment resources, the attraction of foreign direct investment (FDI) is gaining particular importance as one of the key factors of sustainable economic growth.

FDI contributes to the modernization of production capacity, the introduction of innovative technologies, the enhancement of the competitiveness of the national economy, and the expansion of export opportunities. In this regard, the effective management of investment flows becomes a priority task of state economic policy.

At the same time, a characteristic feature of FDI attraction is its spatial unevenness, manifested in a significant concentration of investments in economically developed and infrastructure-provided regions.

Such regional differentiation is determined by differences in the level of socio-economic development of territories, the quality of the institutional environment, the investment climate, as well as the accessibility of resources and sales markets.

The strengthening of interregional disparities may restrain the balanced development of the national economy and require the development of targeted managerial decisions.

In modern conditions, the use of quantitative analysis methods becomes particularly important, allowing not only the identification of existing trends but also the formation of well-grounded forecasts of investment activity.

At the same time, the aspects of integrating various methods of analysis — statistical, econometric, cluster, and spatial — into a unified system for assessing the regional differentiation of investment processes remain insufficiently studied.

LITERATURE REVIEW. Issues related to regional differentiation and the factors influencing the attraction of foreign direct investment (FDI) have been widely covered in the works of a number of foreign and domestic scholars.

An analysis of the existing studies makes it possible to identify key scientific approaches and research directions.

A significant contribution to the study of the spatial distribution of FDI was made by T. Kristin and F. Piribauer, who proposed the use of spatial models for analyzing interregional investment flows in Europe.

Their study demonstrated that spatial dependence and interregional linkages play a key role in shaping

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investment flows.[1]

In the work of M. Petreski and M. Olczyk, the impact of FDI on employment in the regions of the European Union is examined.

The authors proved the existence of spatial effects and the heterogeneity of investment impacts depending on the sectoral specialization of the regions.[2]

Among the studies devoted to the CIS countries, the work of H. Li and S. Chernikov stands out, in which the factors of attractiveness and the territorial determinants of FDI in Kazakhstan, Russia, and Uzbekistan are analyzed.

The authors conclude that the key drivers are market size **(**GDP**)** and resource availability, whereas institutional factors play a less significant role.[3]

Among Uzbek researchers, special attention should be paid to the work of **J**.U. Rakhimov, which analyzes the role of FDI in the integration of Uzbekistan into the global financial system, emphasizing the importance of institutional reforms and currency liberalization for increasing investment inflows.[4]

In the study by F. Rustamov, the strategic determinants of FDI in Uzbekistan are examined on the basis of an ARDL econometric model.

The author identifies such factors as macroeconomic stability, the quality of institutions, and infrastructure development.[5]

RESEARCH METHODOLOGY. The research methodology is aimed at studying the regional differentiation of the attraction of foreign direct investment (FDI) and is based on the integrated use of quantitative and qualitative methods of analysis.

Within the framework of the study, statistical data processing methods are applied, making it possible to identify patterns in the distribution of FDI across regions, assess the level of their concentration, and reveal interregional differences.

For the quantitative assessment of differentiation, index-based approaches are used (for example, the localization index, coefficients of variation, and concentration coefficients), which make it possible to measure the degree of unevenness in the distribution of investments.

In addition, econometric analysis using panel data is employed, which provides the opportunity to identify the influence of macroeconomic, institutional, and resource factors on FDI inflows into the regions.

Special attention is paid to cluster and spatial analysis, which makes it possible to classify regions according to their degree of investment attractiveness, identify investment clusters, and reveal spatial patterns in the distribution of FDI flows.

An important tool is the use of Geographic Information Systems (GIS) for data visualization and the identification of territorial anomalies.

The analysis is based on databases from international and national statistical agencies, including data on foreign direct investment, regional macroeconomic indicators, infrastructure indicators, and socio-economic indicators.

ANALYSIS AND RESULTS. The regional differentiation of the attraction of foreign direct investment (FDI) represents an important subject of scientific research, as it makes it possible to identify territorial differences in investment activity, determine leading and lagging regions, and substantiate directions for improving regional investment policy.

To conduct such an analysis, a combination of statistical, economic-mathematical, and comparative methods is used (Table 1).

Table 1

№	Method Name	Functions	Tools	Application
1	Comparative Statistical Analysis	Identifying differences between regions	FDI, GRP, exports	Analysis of FDI distribution

[1] Krisztin, T. and Piribauer, P. (2020) *Modeling European regional FDI flows using a Bayesian spatial Poisson interaction model*.

[2] Petreski, M. and Olczyk, M. (2025) *Foreign direct investment and job creation in EU regions*.

[3] Lee, H.-S., Chernikov, S.U. and Nagy, S. (2022) *Motivations and locational factors of FDI in CIS countries*. Available

[4] Raximov, J.U. (2025) *Foreign direct investment and financial integration in Uzbekistan*.

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2	Coefficient of Variation Method	Assessing the level of regional differentiation	Mean, σ, V	Assessment of unevenness
3	Index Method	Calculation of indices and shares	Growth indices	Year-by-year analysis
4	Herfindahl–Hirschman Index (HHI)	Identification of dominant regions	Regional shares	Leading regions
5	Correlation Analysis	Determining factors affecting FDI	R	Relationship with GRP
6	Regression Analysis	Quantitative assessment of factor influence	B	Factor analysis
7	Cluster Analysis	Formation of regional typology	K-means	Leaders / outsiders
8	Ranking Method	Comparative assessment of investment attractiveness	Ranks	Investment rating
9	Graphical-Analytical Method	Data visualization	Graphs	Diagrams
10	Panel Data Analysis	Forecasting	Panel FE/RE	Trends over 5–10 years

Methods for Analyzing the Regional Differentiation of Foreign Direct Investment (FDI) Attraction[6]

[6] Compiled by the author based on the reviewed sources.

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The presented table systematizes the main methods used in the study of the regional differentiation of foreign direct investment (FDI) attraction.

Each of the methods performs a specific analytical function, ranging from primary statistical comparison to the construction of complex econometric models.

In the context of the accelerated digitalization of the economy and the active attraction of international capital, the study of regional differentiation in attracting foreign direct investment (FDI) acquires particular scientific and practical significance.

For Uzbekistan, this issue is especially relevant, since the regions of the country are characterized by different levels of economic development, infrastructure provision, investment attractiveness, and sectoral specialization (Table 2).

Table 2

Comparative Analysis of the Regional Distribution of Foreign Direct Investment in Uzbekistan Using the Ranking Method [7]

№	Region	FDI, trillion UZS	Share, %	GRP, trillion UZS	Attractiveness
1	Namangan Region	7.49	17.0	68.9	Very high
2	Tashkent Region	6.36	14.5	146.4	Very high
3	Tashkent City	4.38	10.0	281.1	Very high
4	Navoi Region	3.7	8.4	117.3	High
5	Samarkand Region	3.65	8.3	99.9	High
6	Bukhara Region	2.8	6.4	71.6	High
7	Kashkadarya Region	2.55	5.8	80.7	Medium
8	Fergana Region	2.1	4.8	91.3	Medium
9	Andijan Region	1.95	4.4	68.2	Medium
10	Jizzakh Region	1.7	3.9	53.0	Medium
11	Surkhandarya Region	1.48	3.4	54.4	Moderate
12	Khorezm Region	1.3	3.0	51.3	Moderate
13	Republic of Karakalpakstan	1.15	2.6	54.1	Low
14	Syrdarya Region	0.92	2.1	28.0	Low

The ranking analysis shows that the highest concentration of foreign direct investment (FDI) is observed in the Namangan Region, Tashkent Region, and Tashkent City, which is associated with a high level of industrial development, well-developed infrastructure, and a favorable geographical location.

The presence of the Syrdarya Region, the Republic of Karakalpakstan, and the Khorezm Region among the regions with the lowest ranking indicators indicates the persistence of territorial differentiation in investment activity and the need to adopt additional measures aimed at increasing the investment attractiveness of these regions (figure 1).

[7] Compiled by the author based on the reviewed sources.

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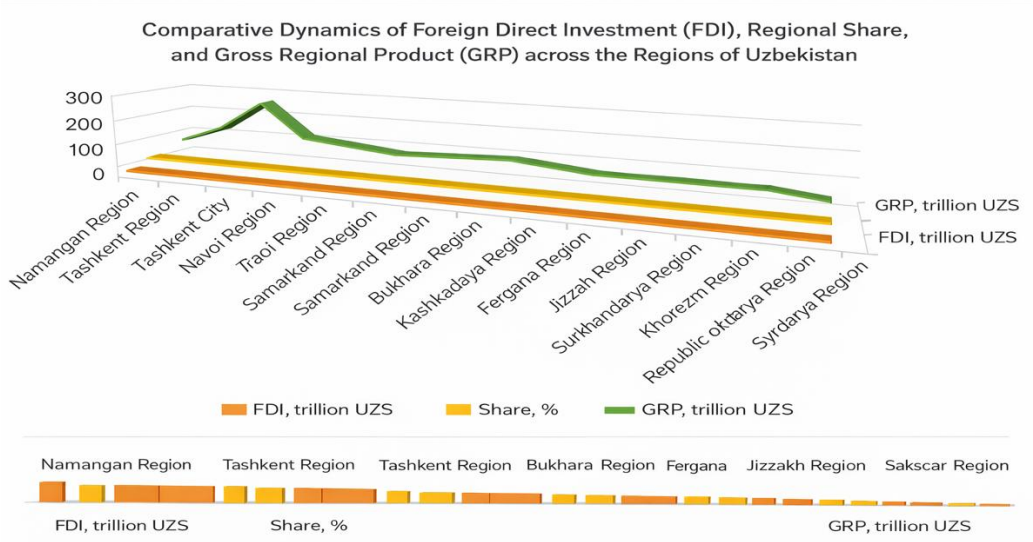

Figure 1. Distribution of Foreign Direct Investment (FDI) and Gross Regional Product (GRP) across the Regions of Uzbekistan[8]

The figure presents a comparative distribution of the volume of foreign direct investment (FDI) and gross regional product (GRP) across the regions of Uzbekistan.

The chart demonstrates significant territorial differentiation in investment activity and the level of regional economic development.

The highest indicator values are observed in Tashkent City, Tashkent Region, and Navoi Region, which indicates a high concentration of investment flows in the economically developed regions of the country.

Particular attention is drawn to the Namangan Region, which occupies a leading position in terms of FDI volume despite having a relatively lower GRP level compared to the capital regions. This may indicate the active development of investment projects and the strengthening of regional investment policy.

At the same time, the Syrdarya Region, the Republic of Karakalpakstan, and the Khorezm Region are characterized by the lowest values both in terms of FDI volume and GRP.

CONCLUSION. Under the current conditions of sustainable economic development of the Republic of Uzbekistan, the issue of attracting **foreign direct investment (FDI)** into the regions is becoming particularly relevant.

The intensification of FDI attraction processes in the regions of the country is an important condition for ensuring balanced economic growth, increasing regional competitiveness, and strengthening their role in the national economy.

During the course of the study, the regional differentiation of foreign direct investment attraction in the regions of the Republic of Uzbekistan was analyzed.

The uneven distribution of investment flows among the regions of Uzbekistan indicates the persistence of differences in the level of investment attractiveness, infrastructure provision, and production potential of individual territories.

Based on the **ranking method**, a study was conducted that made it possible to carry out a comparative assessment of the regions in terms of the volume of attracted FDI, the level of gross regional product, and investment attractiveness, as well as to determine their place in the overall ranking.

The conducted analysis made it possible not only to identify the leading and lagging regions but also to establish a positive relationship between the volume of foreign direct investment and the level of gross regional product, which confirms the dependence of a region's investment attractiveness on the level of its socio-economic development.

The high ranking indicators of these regions are обусловлены a developed industrial and transport infrastructure, a high level of economic activity, a significant volume of gross regional product, and a favorable investment climate, which, in turn, forms a high level of investment attractiveness, strengthens the inflow of foreign capital, and contributes to the

[8] Compiled by the author based on the reviewed sources

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accelerated socio-economic development of these regions.

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