



REGIONAL INVESTMENT ANALYSIS: A PANEL DATA EVIDENCE FROM UZBEKISTAN

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ABSTRACT

This article study applies benchmarking methods introduced by UNCTAD to analyze the investment potential of Uzbekistan's regions. The study categorizes regions into four groups based on the FDI Performance and Potential Index values, indicating their performance relative to others. The qualitative analysis reveals front-runner regions with high FDI performance and potential, such as Bukhara and Tashkent city, as well as under performers like Khorezm and Namangan. Additionally, the study investigates the correlation between FDI and various independent variables using panel data models, such as fixed effect (FE) and random effect (RE), considering factors such as market size, labor costs and internet access. The results provide valuable insights into the factors influencing FDI variations across different regions in Uzbekistan. The regression output, including coefficients, t-statistics and significance levels, helps policymakers, investors, and stakeholders identify key areas for development and attract foreign direct investment.

Introduction. Foreign Direct Investments (FDI) has become a pivotal economic driver to the capital accumulation and knowledge dissemination in developing countries. Thus, there is a growing interest in the attraction of FDI in order to resolve the problems related to the capital shortage in their local market and to boost the economic growth (Al-kasasbeh et al., 2022). As a result, the concept of FDI and its determinants has been studied extensively by academic scholars (Stern, 2002; Kharlamova, 2014). Several economic theories and academic research papers showed that foreign direct investments (FDI) have both positive short- and long-term influence on economic growth and facilitate the increase in productivity due to the flow of experienced human capital, new technological advances, and product innovations into the host countries.

The Organization for Economic Co-operation and Development (OECD, 2002) states that FDI is regarded as a significant growth booster for the world's developing countries; it

facilitates ample opportunities on the access to the global markets and technology advances for emerging nations. In addition, the World Bank (2015) highlighted that the present-day urgency of FDI is not only related with the financial capital inflow, but also there is an increasing importance for technology and innovation transfers. There is a possibility of synergy that might occur as a result of the cross-border investments which enables foreign investors to share their intangible assets, such as innovative ideas and brand names in conjunction with the tangible resources and capabilities of local investors.

Empirical studies regarding the determinants of FDI conducted since 2000 showed that the market size and its growth potential are significantly correlated with the scale of FDI inflows into emerging economies (World Bank, 2015). Furthermore, Hornberger et al. (2011) also considered that the potential and size variables matter importantly for determining the location of FDI projects. They based their conclusion on the evidence that was found as a result of a survey undertaken on approximately 30 thousand FDI projects registered between 2003 and 2011 in the "fdi Market database" by Financial Times. Other scholars, such as Blalock and Gertler (2008) highlighted the significance of the investment environment for foreign investors in the process of deciding where to locate their FDI projects.

Before analyzing the influencing factors to the investment climate within a country, one first needs to explore and comprehend its definitions given by academic scholars and major economic international organizations. For example, Stern (2002) provided a broad definition of the investment climate by linking its core meaning with macroeconomic conditions related with the current and expected governmental policy. These conditions involve the institutional and behavioral environment that influences the investment returns and uncertainties. His analysis identified three groups of aggregate factors that encompass the overall investment climate, including macroeconomic fundamentals, institutions and the governance together with infrastructure, such as utility supplies and transportation. The macroeconomic fundamentals incorporate social, political and macroeconomic stability, while institutions and governance include the level of openness and effectiveness in regulatory organization, tax laws and legal procedures.

Another scholar, Park (2018) conducted research on how FDI influences regional economic development and productivity in the case of South Korea. This current research paper considers the magnitude of the favorable investment climate in the socio-economic expansion of Uzbekistan's regions. Several academic authors who studied the magnitude of investment climate in Uzbekistan drew their attention mostly to the analysis of Uzbekistan's investment climate at the national level. However, the researchers argued the constraints related to FDI attractiveness of the country is attributable to the inadequacy of economic transformational policies.

Furthermore, there are few studies that have been conducted on the investment climate of Uzbekistan's regions and its affecting factors together with their classifications with regard to their capacity to FDI attraction and the level of investment risk. Therefore, the primary focus of this research report is on the identification of the significantly important factors as well as conducting their qualitative and quantitative analysis using the regression method with panel data models, such as Fixed Effect and Random Effect. Within the framework of this study, it is perceived to provide some empirical evidence using historical data through putting forward a hypothesis of that a strong investment climate is linked with

the high FDI inflows into the countries.

Uzbekistan, as one of two double-landlocked countries (the second one is Liechtenstein) that is surrounded by landlocked countries, has limited natural potential for achieving higher economic growth. In this regard, attracting foreign capital investment together with know-how can be considered as one of the drivers to enhance the economic development within the country. It is argued that the

FDI attraction was being directed mostly to the country's natural resources and performed at an inadequate level compared to its peer countries because of the lack of transformational initiatives (Theodore & Polyxeni, 2016). However, Uzbekistan has introduced the Development Strategy for the New Uzbekistan for the period of 2022 to 2026, which highlights the key areas of focus for advancing the development of the nation and promoting economic growth. The New Uzbekistan Strategy aims to draw in foreign investment worth 70 billion USD in the upcoming five years (World Bank, 2022).

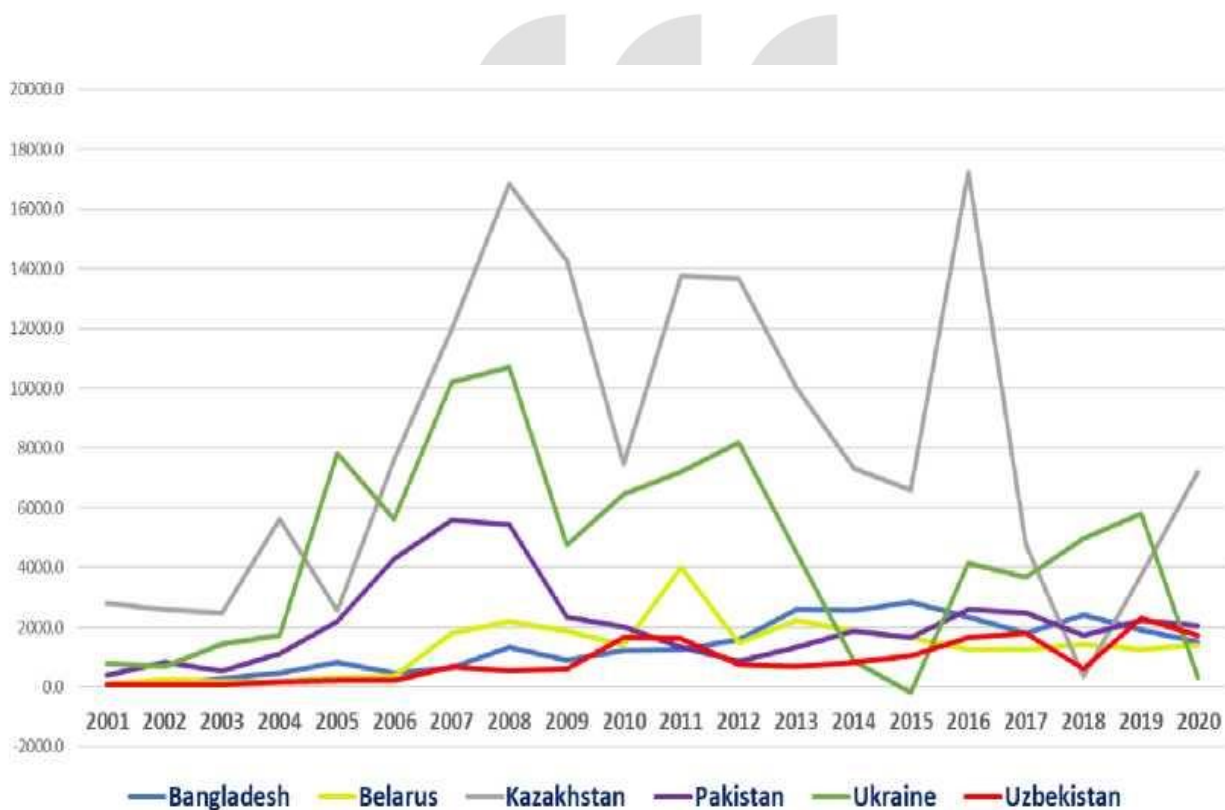
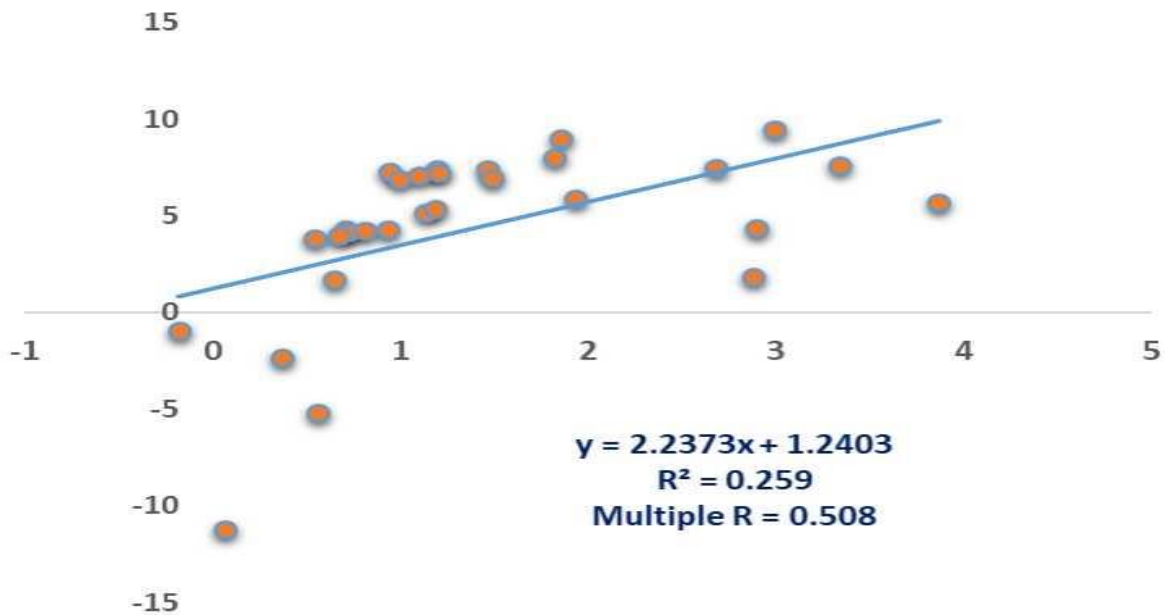


Figure 1. FDI, net inflows in selected countries (current USD, million)

Source: World Bank, 2021

Recent unprecedented international incidents, including COVID-19 pandemic, Russia's war in Ukraine, the disruption of world supply chains together with the impacts of climate change have brought strong pessimistic expectations for foreign investors in the international market, resulting the significant contraction of economic growth and FDI inflows in national economies, including Uzbekistan.

Figure 2. The relationship between FDI inwards and GDP growth in Uzbekistan (1992-2020)

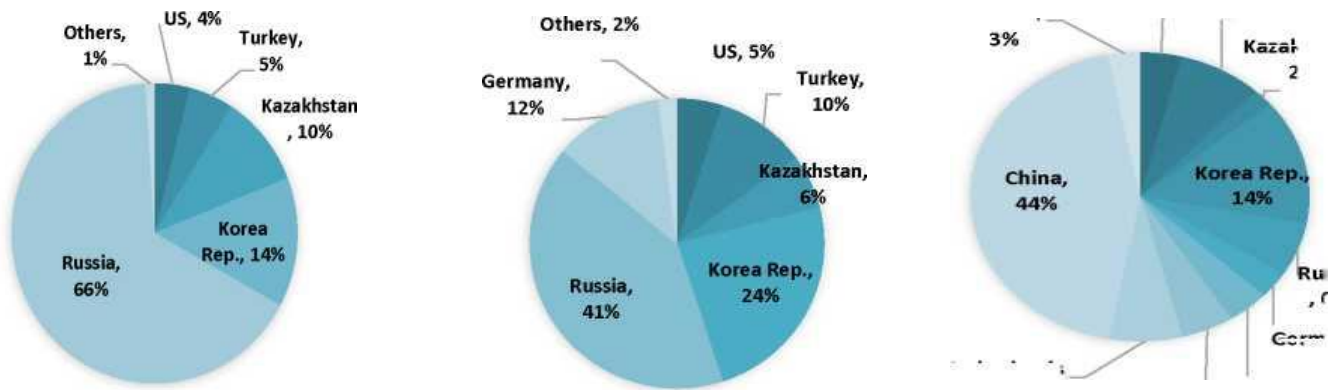


Source: Author's calculation

In order to find out the strength of the relationship between FDI inflows and economic growth in Uzbekistan, the regression analysis illustrated in Figure 2 was carried out. The regression analysis showed that there is moderately correlated relationship (Multiple R = 0.5) between FDI inwards and GDP growth in the case of Uzbekistan.

The sources for Uzbekistan's FDI have been altered substantially over the last decade as the rank for the country's top investor has been shifted to China from Russia owing to the rise of Chinese Belt and Road Initiative (BRI) across the world. In 2009, 5 countries, including Kazakhstan, Turkey, Russia, Korea and the United States, accounted for almost all of Uzbekistan's FDI. Russia was the most significant contributor, investing \$841 million, which comprised two-thirds (66%) of the country's total inward FDI. However, by 2014, Russia's capital resources had plummeted to \$472 million, representing 41% of the total inward FDI, and by 2019, it had dropped to only 5%. This downward trend is expected to continue due to the economic constraints imposed for the Russian War in Ukraine, which may lead to the further restriction in the Russia's FDI potential. FDI from Korea increased from \$181 million in 2009 to \$280 million in 2014, and Germany has emerged as the third-biggest source country for Uzbekistan with its investments that have been totaled at \$134 million.

Figure 3. Source countries of FDI in Uzbekistan



a) 2009

b) 2014

c) 2019

Source: World Bank, 2022

Between 2014 and 2019, China became the leading donor country, with its investors proliferating in Uzbekistan, particularly due to the Belt and Road Initiative.

Chinese investments in Uzbekistan are primarily focused on various industries such as agriculture, transport and telecommunications, traditional energy industry (oil and gas), textiles, and chemicals. By the end of 2020, there were nearly 1,800

Chinese-invested enterprises in Uzbekistan, which was second only to Russia. The FDI stock from China exceeded \$1 billion in 2019, accounting for 44% of Uzbekistan's total inbound FDI amounts.

When we analyze the sectorial distribution of FDI inwards in Uzbekistan, it will be precise that FDI inflows have been mainly directed into only specific sectors of the economy, especially mining and quarrying. The underlying reason for this phenomenon is that the country has been considered fourth country who has the biggest gold reserves with the production capacity of 92 tons per annum. In addition, it ranked tenth and eleventh worldwide in terms of copper and uranium reserves, respectively. According to the World Bank (2022), the largest proportion of greenfield FDI and cross-border mergers and acquisition (M&A) is accounted for several particular industries, including natural resource sector (mining and quarrying), manufacturing and telecommunication (Figure 4).

Figure 4. FDI distribution by sectors in Uzbekistan, 2003-2019

a) Greenfield FDI

b) Cross-border M&A

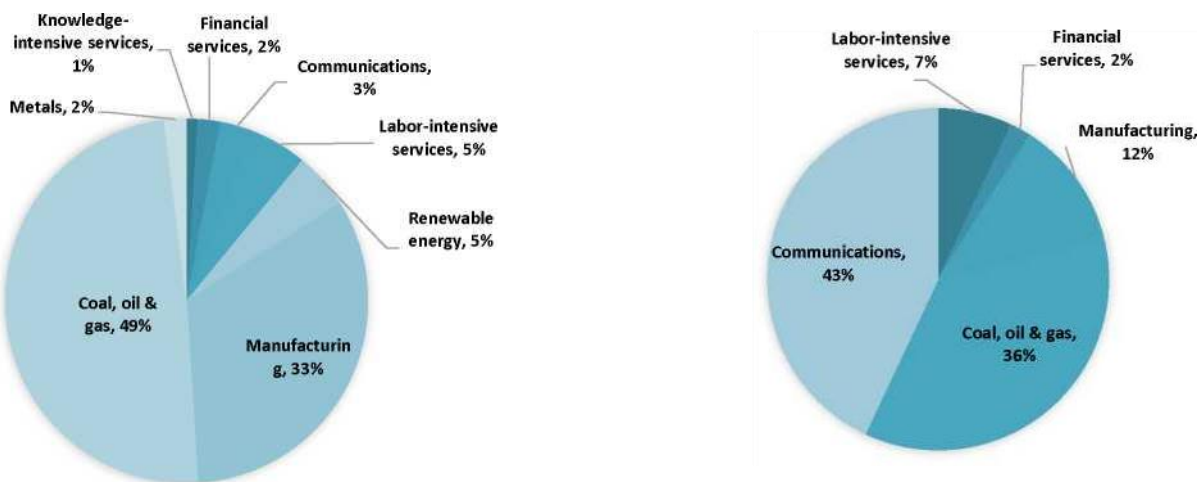


Figure 4 indicates the sectorial distribution of average FDI inflows in Uzbekistan between 2003-2019. As the country endowed with valuable natural resources, almost 50% of greenfield FDI and 36% of transnational M&A in the country is attributable for conventional energy industry (coal, oil and gas).

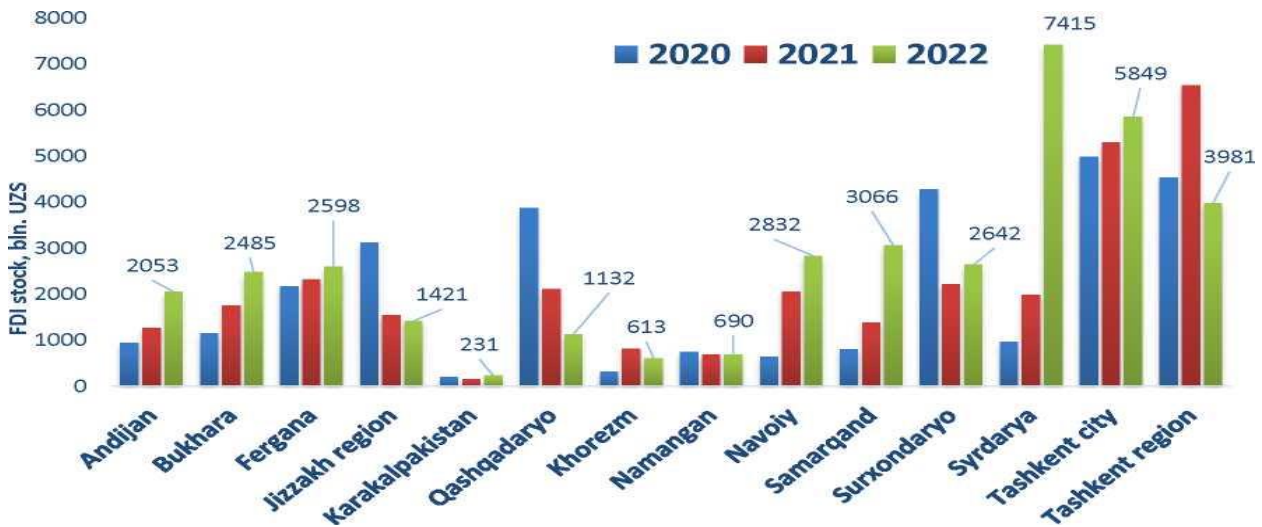
The country managed to implement 354 greenfield investment projects successfully that worth to almost 40.2 billion USD between 2003 and 2019 (World Bank, 2022). Between 2009 and 2019, the manufacturing industry experienced a 17% increase in greenfield FDI projects. The primary investors in greenfield FDI projects in Uzbekistan are Russia, China, South Korea, Germany, and the United States.

FDI in M&A is limited to specific sectors in Uzbekistan, with the telecom industry receiving the most significant investment of \$925 million between 2003 and 2019. Mining and manufacturing industries hosted \$584 million and \$189 million, respectively, during the given period while the substantial portion of this investments have been accommodated in the 2000s. In Uzbekistan, Russia played key role as a leading source country for crossborder M&A, with the investment flow that was totaled at \$1.3 billion from 2003 to 2019.

The economic development varies significantly among Uzbekistan`s these administrative regions due to the disparities in the distribution of the production factors, including labor and capital resources. Consequently, the degree of investment climate reflected by inward FDI stock is prone to fluctuate regionally based on their investment potential and risk. This challenging issue requires in-depth examination of the current situation.

The following qualitative analysis showed that over the last five years the average amount of inward FDI constituted 29,230.3 billion UZS in Uzbekistan, with the sharp annual jump (184%) in 2019 from 13,085.0 to 37,170.7 billion UZS proceeding steady growth with 8.7 % compounded annual growth by 2022.

Figure 5. The allocation of FDI stock among Uzbekistan’s regions



Source: State Committee on Statistics of the Republic of Uzbekistan, 2022

Guimaraes et al. (2000) examined the location-specific factors that affecting the decision-making process of greenfield investment projects within a country and concluded that agglomeration effect act predominantly in determination of the FDI location. In addition, the analysis that is depicted in Figure 6 demonstrated that there is spatial dependency in terms of the FDI attractiveness of regions. It supports the notion that the region’s FDI attractiveness and potential can be accelerated by the neighboring regions. For example, regions of Bukhara, Surxondarya and Qashkadarya were able to host similar sustainable portions of total FDI inwards while the regional group including Khorezm region (592.6 billion UZS) and the Republic of Karakalpakstan (1,747.6 billion UZS) received the minimal amount of inward FDI compared to the other regions.

Figure 6. Cumulative distribution of FDI stock in Uzbekistan, 2018-2022 (billion UZS)



Source: Author's calculation based on the database of the State Committee of the Republic of Uzbekistan

However, the neighboring valley regions of Uzbekistan, including Fergana (7,089.8 billion UZS), Andijan (4,262.6 billion UZS) and Namangan regions (2,132.4 billion UZS) have witnessed significantly differentiated level of FDI inflows albeit they have the combined potential of spatial economic development.

2. Results and Discussion.

In this article, the comprehensive analysis incorporating the benchmarking methods, such as FDI Performance and Potential Index that were introduced by UNCTAD in 2003 have been applied for Uzbekistan's regions. Eventually, these methods facilitated to categorize the regions into 4 groups in terms of the values which reflect their performance and potential.

2.1 Inward FDI Performance Index. To capture a region's performance relative to the others, the PEI which is devised by UNCTAD has been computed. The index originally indicates the FDI performance of a national economy compared to others by dividing its share in total FDI flows globally by its proportion in world's GDP. Application of this methodology at the regional level enable us to analyze the investment potential of regions in line with their market size. A useful rule of thumb is that a region with a higher than one index value implies the presence of strong investment climate, including ample growth potential, abundant economic production resources (skilled labor) and infrastructure. In contrast, the region with an index value of below 1 is assumed to suffer from insufficiencies in productions resources, infrastructure and competitiveness relative to other regions. Pursuant to the Performance index values of regions as depicted in Table 1, the regions showed various trends in terms of the index values for the periods of 2010-2015, 2016-2020 and 2010-2020. Performance Index scores for Bukhara (2.56), Jizzakh (1.77), Karakalpakstan (1.57), Qashqadaryo (1.43), Surxondaryo (1.37), Syrdarya (1.04) and Tashkent city (1.13) demonstrated superior values

relative to their economic size during the last 10 years. On the other hand, Khorezm and Fergana regions performed poorly in terms of their Performance Index values, such as 0.41 and 0.66, respectively within the same given period. Table 1. Accumulated Inward FDI in Uzbekistan's regions

Table 1. Accumulated Inward FDI in Uzbekistan's regions

Regions	Percentage Distribution		FDI Performance Index				FDI Potential Index		
	2010-2015	2016-2020	2010-2020	2010-2015	2016-2020	2010-2020	2010-2015	2016-2020	2010-2020
Andijan	1.2	4.1	3.7	0.17	0.56	0.50	0.378	0.349	0.347
Bukhara	29.2	14.0	16.2	4.42	2.25	2.56	0.449	0.377	0.393
Fergana	2.4	5.6	5.1	0.29	0.74	0.66	0.459	0.470	0.448
Jizzakh	0.3	7.3	6.3	0.10	2.04	1.77	0.189	0.194	0.184
Karakalpakstan	21.7	3.6	6.2	6.42	0.86	1.57	0.274	0.271	0.257
Qashqadaryo	11.2	11.6	11.5	1.17	1.55	1.43	0.267	0.278	0.255
Khorezm	0.7	2.0	1.8	0.16	0.46	0.41	0.194	0.169	0.164
Namangan	0.7	4.5	3.9	0.12	0.82	0.72	0.208	0.204	0.209
Navoiy	5.6	5.8	5.8	0.96	0.78	0.83	0.371	0.380	0.368
Samarqand	0.9	3.4	3.0	0.09	0.37	0.33	0.375	0.356	0.351
Surxondaryo	0.4	8.4	7.2	0.07	1.66	1.37	0.200	0.206	0.196
Syrdarya	0.4	3.1	2.7	0.15	1.21	1.04	0.141	0.109	0.111
Tashkent city	18.8	19.9	19.7	1.21	1.09	1.13	0.837	0.829	0.840
Tashkent region	6.3	6.9	6.8	0.54	0.59	0.58	0.547	0.560	0.543
Uzbekistan	100	100	100						

Source: Author's own calculation

2.2 Inward FDI Potential Index

Unlike the Performance Index, which relies on FDI inflows, Potential Index primarily considers long-lasting structural economic factors. This causes the index values for countries to remain relatively stable over time, and largely reflect their level of economic development. Computation of FDI Potential Index that encompass 12 macroeconomic indicators devised by UNCTAD (2007) is fairly challenging due to the unavailability of relevant data to capture all proposed indexes at the regional level. Therefore, the calculations on the Potential Index for regions in Uzbekistan were based on the 5 variables (the share on total Inward FDI stock, GDP growth rate, GDP per capita, the share of exports in GDP, the number of tertiary graduates) that were originally suggested by UNCTAD and other 7 different substitute variables (total population, share of manufacturing employment, labor cost, freight and passenger turnover, number of subscribers with Internet access and number of registered crimes).

Table 2. Matrix of inward FDI performance and potential

	High Performance	Low Performance
	FRONT-RUNNERS	BELOW POTENTIAL
High Potential	<i>Tashkent city Bukhara</i>	<i>Fergana Navoiy Samarqand Tashkent region</i>
	ABOVE POTENTIAL	UNDER-PERFORMERS
Low Potential	<i>Andijan Jizzakh Kashkadarya Surkhondarya Syrdarya The Republic of Karakalpakstan</i>	<i>Khorezm Namangan</i>

According to the Potential Index score, top performing regions are Tashkent city, Tashkent and Bukhara regions while Syrdarya, Khorezm, and Jizzakh showed the lowest potential scores at 0.111, 0.164 and 0.184 respectively during the last 10 years.

Based on the performing values of the Performance and Potential indices, the regions can be divided into 4 categories, such as ‘front-runners’, ‘above-potential’, ‘below-potential’ and ‘under-performer’ in accordance with the description of the UNCTAD (2002):

- “front-runner”: regions with high performance and high potential;
- “above-potential”: regions with high performance and low potential;
- “below-potential”: regions with low performance and high potential;
- “under-performer”: regions with low performance and low potential.

It is assumed that if the region’s performance score is higher than 1, it is regarded as having high potential, otherwise low potential. In addition, if a region has a potential index value that is higher than 0.351 (the mid-point of the ranking by the potential of all region), it is considered to have high potential. Otherwise it is regarded as a region with low potential.

Concluding Remarks

The study analyzed the investment potential of Uzbekistan's regions using benchmarking methods introduced by UNCTAD, including the Inward FDI Performance and Potential Index. The Performance Index is used to evaluate a region's FDI performance relative to others, while the Potential Index considers long-lasting structural economic factors. The regions are categorized into four groups based on their Performance and Potential Index values: front-runners, above-potential, below-potential, and under-performers.

Finding of the qualitative analysis indicated that Bukhara and Tashkent city are the only regions that are considered front-runners due to their high performance and potential values. On the other hand, Khorezm and Namangan are under-performers with the lowest performance and potential values. Additionally, some regions, including Fergana, Navoiy, Samarqand, and Tashkent region, are grouped as below-potential due to their low

performance index values despite having high potential index values. Finally, six regions, including Andijan, Jizzakh, Kashkadarya, Surkhondarya, Syrdarya, and The Republic of Karakalpakstan, have high performance but low potential values, making them a fourth group. Furthermore, the research study examined the relationship between foreign direct investment (FDI) and 13 independent variables that capture the various aspects of a region, including the market size, labor potential, infrastructure quality, economic openness, life quality and agglomeration variables. The regression analysis used two methods: fixed effect and random effect method. The fixed effects model was chosen due to the Hausman test results. The regression output provided the coefficients and t-statistics values for each independent variable, as well as their confidence levels for statistical significance. The R-squared value of the fixed effects model was 0.7052, indicating that the independent variables can explain a significant proportion of the variation in FDI. The F-test value was 23.37, indicating that the independent variables are jointly significant in predicting FDI. The random effects model generated an R-squared value of 0.6172, but the Hausman test showed that the fixed effects model was preferred. Overall, the analysis provides valuable insights into the factors that are associated with variations in foreign direct investment across different regions in Uzbekistan.

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