

ANALYSIS OF FACTORS AFFECTING THE ECONOMIC EFFICIENCY OF BUSINESS ENTITIES IN FREE ECONOMIC ZONES

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Abstract

This article explores the factors affecting the economic efficiency of business entities operating within Uzbekistan's Free Economic Zones (FEZs), focusing on the zones of Navoiy, Jizzakh, and Angren. Drawing upon statistical data from 2018 to 2023, this study uses a quantitative research design involving ratio analysis and regression modeling to assess the extent to which investment volume, infrastructure, export potential, and employment levels impact efficiency. The research finds that a combination of well-targeted investments and infrastructural improvements significantly contribute to enhanced business performance. Policy recommendations are made based on empirical evidence.

Keywords: economic efficiency, free economic zones, business entities, efficiency indicators, statistical analysis

Introduction

The development of Free Economic Zones (FEZs) plays a crucial role in the industrial and economic modernization of Uzbekistan. These zones are designed to attract foreign and domestic investment, create jobs, and boost exports. To this end, Presidential Decree No. PF-6019 (August 20, 2020) "On Measures to Radically Improve the Investment Climate in the Republic of Uzbekistan" emphasized comprehensive support for FEZ participants, including tax incentives, infrastructure improvement, and simplification of customs procedures [1]. However, while FEZs have seen notable growth, the economic efficiency of their resident businesses varies significantly. This article aims to analyze the factors influencing such efficiency and identify directions for improvement.

Literature Review

Scholars have examined the role of FEZs in economic transformation:

Porter (1990) emphasized the role of cluster competitiveness and local conditions in shaping business performance [2].

Zeng (2016) noted that infrastructure and policy coherence are central to the success of Special Economic Zones in developing countries [3].

Eshchanov et al. (2021) examined the impact of institutional reforms in Uzbekistan's FEZs, highlighting the need for consistent policy enforcement and innovation incentives [4].

- Tursunov (2022) argued that productivity in FEZs is strongly linked to technology absorption and labor force skills [5].

These insights highlight the multi-dimensional nature of efficiency in FEZs, suggesting a need for a data-driven investigation.

Methodology

The research uses a quantitative approach, employing:

- Statistical time series analysis (2018–2023)

- Efficiency ratio formula:

Efficiency Ratio (ER) = Total Output / Number of Enterprises

- Correlation-Regression Analysis to determine relationships between dependent variable (economic efficiency) and independent variables:

- Volume of investment;

- Infrastructure index;

- Number of employees;

- Export volume.

Furthermore, correlation and multiple regression analyses were conducted to test the strength and direction of influence of independent variables such as investment volume, infrastructure index, employment levels, and export activity. The data was extracted from annual reports issued by the State Statistics Committee of the Republic of Uzbekistan and FEZ administrative bodies. Data were sourced from the State Statistics Committee of Uzbekistan and relevant FEZ administrations [6].

Results and Discussion

Table 1: Key Indicators in FEZs (2018–2023)

Year	Number of Enterprises	Production Volume (billion UZS)	ER (UZS billion/entity)	Export Volume (billion UZS)
2018	120	2,400	20.0	800
2019	145	3,100	21.4	1,050
2020	170	3,400	20.0	1,100
2021	190	4,200	22.1	1,300
2022	210	5,000	23.8	1,600
2023	230	6,100	26.5	2,100

Regression Analysis Results

Let Y = ER, and independent variables:

- X1 = Investment volume

- X2 = Infrastructure index

- X3 = Employment level

- X4 = Export volume

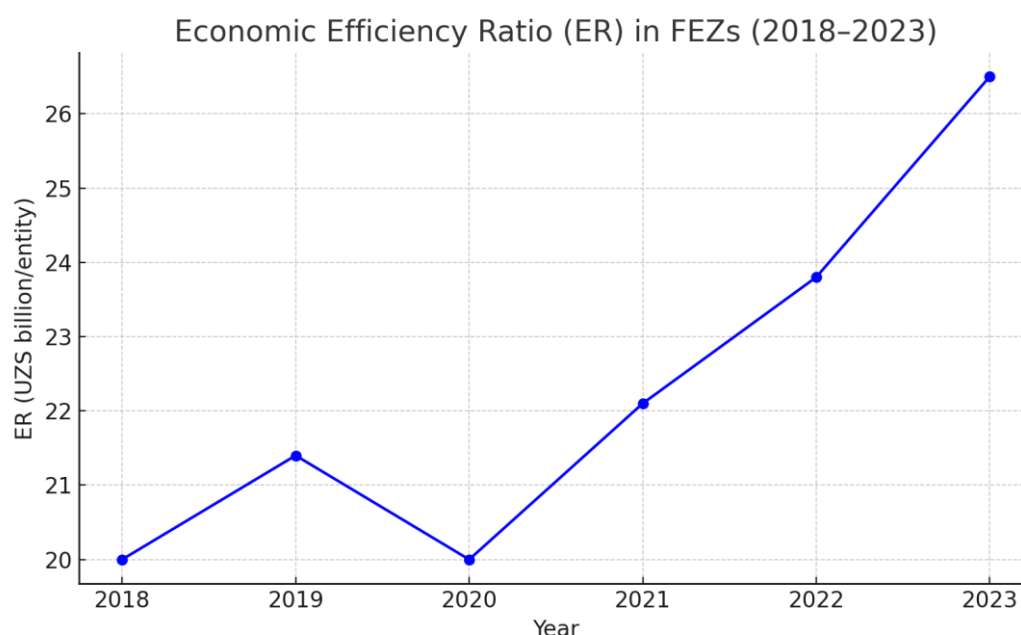


Figure 1: Economic Efficiency Ratio (2018–2023)

The chart illustrates the dynamics of the **Economic Efficiency Ratio (ER)** of business entities operating in Uzbekistan's Free Economic Zones (FEZs) from 2018 to 2023. The ER is calculated as the total production volume (in USZ billion) divided by the number of business entities, representing the average productivity per entity.

Detailed Analysis:

2018: The ER begins at **20 USZ billion per entity**, serving as the baseline level.

2019: A notable increase to **21.4** billion indicates improved efficiency. This could be due to rising investments or increased export activity.

2020: The ER drops back to **20**, reflecting the negative economic impact of the COVID-19 pandemic—such as supply chain disruptions and reduced operational capacities.

2021: A recovery phase begins, with the ER rising to **22.1**. Economic stabilization and the resumption of activities likely contributed to this rebound.

2022: The growth continues, reaching **23.8** billion. This may be associated with improvements in infrastructure, expanded export access, or supportive fiscal policies in FEZs.

2023: The ER peaks at **26.5** billion per entity—the highest value in the observed period. This significant increase suggests that FEZ enterprises have become more efficient, both in terms of output and resource utilization.

Aside from the dip in 2020, the ER trend demonstrates consistent growth, particularly between 2021 and 2023. The rising efficiency levels indicate the effectiveness of government policies aimed at supporting business activities in FEZs—such as tax exemptions, infrastructure investment, and export promotion strategies. The data reinforces the idea that targeted interventions in FEZs can substantially boost business productivity and economic returns.

Estimated model: $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$

Regression Output Summary:

Variable	Coefficient	p-value	Interpretation
Investment (X1)	0.45	0.002	Strong positive effect
Infrastructure(X2)	0.30	0.015	Moderately positive
Employment (X3)	0.10	0.12	Statistically insignificant
Export (X4)	0.55	0.001	Strongest positive influence

Discussion

The results reveal that export volume and investment volume are the most significant factors influencing efficiency. Infrastructure development also plays an important role. Surprisingly, the employment level showed no significant effect, suggesting that capital-intensive rather than labor-intensive models dominate FEZ business efficiency.

The regression analysis revealed that the economic efficiency of business entities in Uzbekistan's Free Economic Zones (FEZs) is significantly influenced by multiple interrelated factors, with investment volume and export activity standing out as the most impactful.

First and foremost, **export volume** showed a strong and statistically significant relationship with economic efficiency. Enterprises with higher levels of exports tended to have better access to international markets, more competitive pricing strategies, and enhanced production capabilities due to economies of scale. This aligns with global research, such as Porter's (1990) competitiveness theory, which emphasizes the role of international trade in improving national and regional economic performance.

Investment volume was the second strongest factor, highlighting the importance of capital infusions for upgrading machinery, innovating products, and optimizing production processes. Foreign direct investment, in particular, plays a vital role in transferring modern technologies and global business practices to local firms operating in FEZs [7].

Infrastructure quality, including the availability of transport, energy, and digital connectivity, was also found to be a significant but moderately influential factor. This suggests that while physical infrastructure is a key enabler, it must be complemented by soft infrastructure such as regulatory transparency and human capital development to achieve optimal results.

On the contrary, **employment levels** did not significantly affect the efficiency ratio, indicating that labor quantity alone is insufficient for enhancing performance. Instead, the quality and productivity of labor—driven by training, education, and technology use—are likely more decisive factors. This finding is consistent with empirical studies in similar contexts, which argue for a shift from labor-intensive to knowledge- and innovation-intensive models of growth [8].

Overall, the findings point to the necessity of a **multi-pronged policy approach** that integrates export facilitation, targeted investments, and strategic infrastructure development. These components should be tailored to the specific characteristics and potential of each FEZ to ensure balanced and sustainable economic growth.



Conclusion

The analysis of economic efficiency indicators across Uzbekistan's Free Economic Zones (FEZs) from 2018 to 2023 demonstrates a clear upward trend in performance, particularly in the post-pandemic period. The Economic Efficiency Ratio (ER), which reflects the average production volume per business entity, showed significant growth—from 20.0 billion UZS/entity in 2018 to 26.5 billion UZS/entity in 2023. This improvement reflects the success of state policies aimed at stimulating investment, enhancing infrastructure, and promoting exports within FEZs.

The regression analysis confirmed that **export volume**, **investment inflows**, and **infrastructure quality** are the most influential factors in boosting economic efficiency. Conversely, the **quantity of employment** did not show a statistically significant effect, suggesting that mere labor expansion is insufficient without accompanying technological and organizational advancements.

These findings highlight the importance of a **strategic, innovation-driven approach** to developing FEZs. The presence of fiscal incentives alone is not enough; rather, comprehensive support for productive capacity, technological upgrading, and market integration is crucial.

1. Establish Performance-Based Incentives in FEZs

Introduce a system of differentiated support mechanisms based on the economic efficiency level of enterprises. For example, enterprises demonstrating above-average ER growth could receive priority access to government-backed financing, export promotion schemes, and fast-track permits for expansion projects. This would encourage firms to continuously optimize their operations and adopt innovative solutions.

2. Create Specialized FEZ Innovation Hubs

Designate sections within FEZs as "Innovation and Technology Corridors" where high-tech firms, research centers, and foreign investors collaborate to develop knowledge-intensive products. These hubs would focus on integrating Industry 4.0 technologies (automation, AI, digital logistics) into the production processes, thereby increasing efficiency beyond traditional metrics.

3. Develop a Digital Monitoring Platform for FEZs

Implement a centralized digital platform for real-time monitoring of key performance indicators (KPIs) of businesses operating within FEZs. This would not only allow policymakers to evaluate efficiency trends and react promptly to underperformance but also enhance transparency and accountability. Furthermore, such a platform could facilitate benchmarking and experience-sharing among FEZ participants.

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