

## **The importance of special economic zones in the Kashkadarya region**

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### **Abstract**

This article analyzes the investment activity of special economic zones (SEZs) in Kashkadarya. It details tax and customs privileges, a developed infrastructure system, a favorable business environment, regional specialization, export potential, attraction of foreign investments, development of innovative technologies and other features. The article also presents statistical indicators of SEZs in Kashkadarya region in recent years, analyzes their contribution to the country's economic development, and uses the Stata 17 program to determine the number of observations, average values, standard deviations and minimum-maximum limits, and conducts econometric analysis. The results and conclusions from the study indicate that the benefits of economic and industrial zones in this region will also be an effective mechanism for the economy of Uzbekistan.

Keywords: special economic zones (SEZs), infrastructure, Log-log model, econometric analysis, industry, bureaucracy.

### **Introduction**

It is worth noting that in recent years, targeted work has been carried out in our country to ensure the legality of the activities of special economic zones, as well as the use of tax and customs privileges to attract foreign and local investments.

In particular, taking the example of Kashkadarya, in accordance with the Resolution of the President of the Republic of Uzbekistan No. PQ-4853 of 2020 "On measures for the accelerated industrialization of territories" [1], several goals

were set to further improve the activities of special economic zones. Also, in accordance with the Presidential Resolution No. PQ-96 of March 13, 2026 “On the acceleration of measures aimed at the socio-economic development of the Kashkadarya region” [2], the special economic zone “Mubarak innovative industrial zone” was established on an area of 200 hectares in the Mubarak district of the Kashkadarya region. At the same time, attracting investments to the region and developing industrial infrastructure through the creation of new industrial zones has been identified as a priority. Such decisions serve as an important legal basis for increasing the efficiency of work in this area.

A special economic zone is a specially allocated territory with defined boundaries and a special legal regime in order to attract foreign and local investments, high technologies and management experience for the accelerated socio-economic development of the relevant territory. [3]

In this study, an econometric analysis was carried out on the development of special economic zones in the Kashkadarya region, and the factors affecting its effectiveness were studied using the Stata program. At the same time, it is advisable to use the log-log functional form of the OLS regression model when conducting econometric analysis in the study. The main reason for this is that most of the selected indicators, namely Y (GDP in the SEZ sector), X1 (number of employed people), X2 (volume of innovations) and X3 (volume of investment resources), are expressed in nominal values, which are sensitive to the impact of inflation and changes in price levels. X4 (export volume) is presented in real terms and is an indicator adjusted for price changes.

Therefore, it is necessary to use logarithmic transformation to analyze these indicators on a single methodological basis and more accurately assess their interrelationships. Using the log-log model, on the one hand, allows us to determine the relative changes (elasticities) between indicators, and on the other hand, it serves to stabilize data dispersion, reduce the problem of heteroscedasticity, and increase the statistical reliability of the model results.

In addition, the log-log model is also of great importance in terms of economic content, as it allows reflecting the functional dependence of the Cobb-Douglas type, which characterizes the production process. As a result, the impact of each factor on GRP is interpreted in the form of elasticity, which makes the results of the analysis more accurate and understandable from a scientific and practical point of view.

### **Review of relevant literature**

The issues of organizing and developing special economic zones in the Kashkadarya region have been widely studied by international and local researchers.

O.H. Amonullayev [4] in his article “Territorial aspects of improving the activities of free economic zones in the Kashkadarya region” studied the existing problems in organizing and improving special economic zones in the Kashkadarya region. At the same time, this article provides statistical data that 70.8% of investments are concentrated in only 4 districts, the profit level is 25–40%, and the return on capital is 3–3.5 years.

J. Usmanov [5] in his scientific work “Theoretical and methodological foundations of organizing special economic zones” analyzed new opportunities and prospects in the Kashkadarya region, as well as the industrial and resource potential of the region in terms of economy, industry, and production.

A. O. Azimov [6] in his article “Economic analysis of development of foreign investments in providing economic growth of Kashkadarya region” states that in recent years the volume of investments in Kashkadarya has increased by 4 times and that one of the main tasks of SEZs is to attract investment.

Based on the above information, the following goals and objectives are set in this article:

1. Theoretical study of the development of special economic zones in Kashkadarya region;

2. Empirical analysis of correlation and regression of factors affecting the improvement of SEZs in Kashkadarya;
3. Determination of the effectiveness of Uzbekistan in establishing such SEZs;
4. Development of strategic recommendations for the implementation of special and free economic zones in Kashkadarya region.

The article is structured as follows: The "Literature Analysis" section reviews scientific works on the topic; The "Methodology" section describes methodological approaches, measurement models, and data sources; the "Analysis and Results" section analyzes the existing SEZs in the Kashkadarya region, presents the results of econometric analysis, problems, and solutions; and the "Conclusions and Recommendations" section presents the results achieved, limitations, and practical recommendations.

### **Research methodology**

In this study, the importance of special economic zones in the Kashkadarya region was studied based on a systematic approach. Also, empirical methods were used in the analysis process through correlation and regression analysis, and data for the period 2010-2025 were analyzed and an econometric model was created. The following independent and dependent variables were used in the process of correlation analysis of data in the Stata 17 program. Here:

- Y- Gross domestic product, billion soums
- X1 Investments in fixed capital, billion soums soum
- X2 Economically active population, thousand people
- X3 Foreign trade turnover, billion soums
- X4 Inflation rate (%)

The study selected a simplified model with one logarithmic independent variable as the main model:

$$\ln Y = \beta_0 + \beta_1 \ln X + \varepsilon t$$

Where:

- $\ln Y$  — Gross domestic product, billion soums (independent variable)
- $\beta_0$  – constant (continuous term)
- $\beta_1$  – regression coefficient
- $\ln X$ – independent variable
- $\epsilon_t$  – margin of error in year  $t$

The information base of the study is the data of the National Statistics Committee of the Republic of Uzbekistan.

### Analysis and Results

This analysis and results analyze the important role of special economic zones in the economy of Uzbekistan in the Kashkadarya region, show how important these problems are, and also identify existing problems and propose acceptable solutions to them. In this study, the log-log functional form of the OLS regression model was used to conduct econometric analysis.

We begin the empirical analysis process with an analysis of general indicators.

Table 1 Descriptive statistics table [8]

Variable	Obs	Mean	Std. dev.	Min	Max
$\ln Y$	16	5.559937	.7347084	3.819908	6.269475
$\ln X_1$	16	7.39553	.5393659	6.075346	7.914618
$\ln X_2$	16	7.335626	.330567	6.483108	7.711907
$\ln X_3$	16	6.721713	.5599772	5.369708	7.267386
$\ln X_4$	16	2.664242	.9702836	1.199965	3.696352

According to the results of the descriptive statistics, the number of observations for all logarithmic variables ( $\ln Y$ ,  $\ln X_1$ ,  $\ln X_2$ ,  $\ln X_3$ ,  $\ln X_4$ ) is the same (16), which ensures the suitability of the data set for building the model. Analysis of the mean values and standard deviations shows that there are no sharp differences in dispersion between the variables, that is, the data are relatively stably distributed. In particular, the dispersion is slightly higher for the  $\ln X_4$  variable, which is explained by the significant variability of the export volume over time. The logically consistent expansion of the range of minimum and maximum values

confirms the growth trend of the indicators. In general, as a result of the logarithmic transformation, the data set has approached normality and is statistically suitable for conducting OLS regression analysis. In the next step, we will perform the process of correlation analysis between factors.

Table 2 Correlation analysis matrix [8]

. cor lnY lnX1 lnX2 lnX3 lnX4 (obs=16)					
	lnY	lnX1	lnX2	lnX3	lnX4
lnY	<b>1.0000</b>				
lnX1	<b>0.9770</b>	<b>1.0000</b>			
lnX2	<b>0.9745</b>	<b>0.9689</b>	<b>1.0000</b>		
lnX3	<b>0.9661</b>	<b>0.9849</b>	<b>0.9864</b>	<b>1.0000</b>	
lnX4	<b>0.9206</b>	<b>0.8917</b>	<b>0.9197</b>	<b>0.9178</b>	<b>1.0000</b>

The results of the correlation analysis show that the volume of investments in fixed capital (X1) and the number of economically active population (X2) have a very strong positive correlation with the volume of GDP (Y). At the same time, there is a high correlation between other variables, since the variables (X3, X4, X5) are very close to each other in the correlation table. These correlations show that:

- The results of the study show that special economic zones in the Kashkadarya region play an important role in ensuring economic growth. In particular, they significantly contribute to the increase in the volume of gross domestic product by attracting investments, creating new jobs and developing foreign trade.
- According to the results of the correlation analysis, all the main factors (investments, employment, foreign trade and inflation) are highly correlated with GDP, which confirms the complex economic impact of special economic zones.

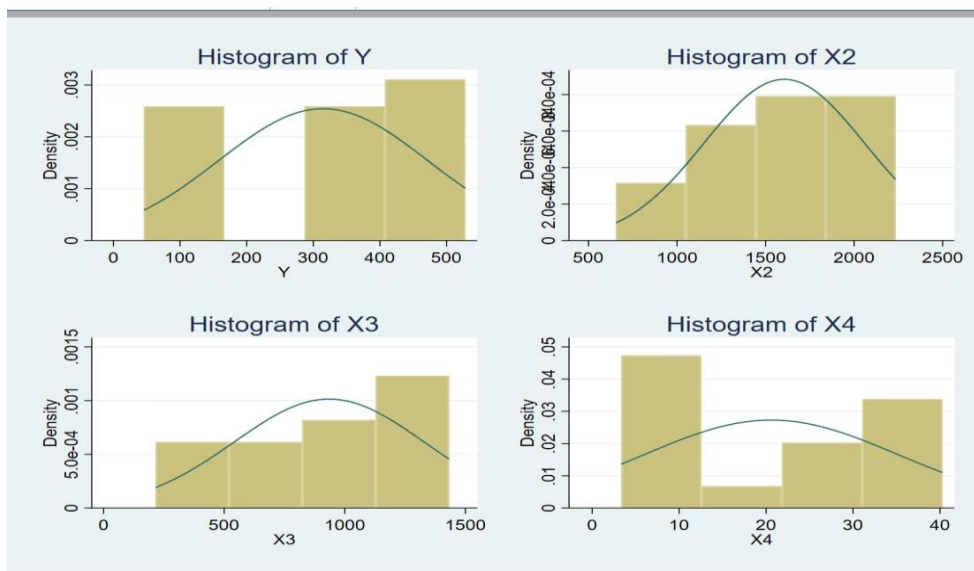
At the same time, maintaining the inflation rate within acceptable limits is an important factor for ensuring economic stability. In general, the development of

special economic zones and increasing their efficiency are of strategic importance in ensuring the long-term economic growth of the Kashkadarya region.

Regression analysis was not used in this study, since a high level of multicollinearity (in the range of 0.96–0.98) was observed between the independent variables. This situation reduces the reliability of the regression model. Therefore, a correlation approach was used in the analysis, assessing the degree of interdependence between economic indicators.

In the following, this process is considered with common histograms.

Table 3 Initial graphical analysis [8]



Histogram analysis shows that the main macroeconomic indicators in the Kashkadarya region have different distribution characteristics. The shift of GDP towards higher values indicates increased economic growth. While the economically active population has a relatively stable distribution, fluctuations are observed in foreign trade and inflation indicators. This situation indicates the need to ensure macroeconomic stability, along with an increase in investment, employment and trade volumes through special economic zones.

**Conclusions and recommendations**

The results of the study show that some problems may be encountered in improving special economic zones in the Kashkadarya region and increasing their

economic efficiency, such as infrastructure, bureaucracy and red tape, or investment. However, strong attention should be paid to such indicators as the volume of investments in fixed capital, the number of economically active population, foreign trade turnover, and inflation rate, since the above analysis shows that these variables are highly correlated with GDP, and therefore these factors lead to the effectiveness of special economic zones in Kashkadarya.

### **List of used literature**

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