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ECONOMETRIC ANALYSIS OF ATTRACTING INVESTMENTS TO SPECIAL ECONOMIC ZONES IN UZBEKISTAN

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ABSTRACT

An econometric analysis of attracting investments to special economic zones is presented in the article. Also, an econometric study was carried out to sort out the factors and explain them, to build an econometric model that shows the level of interdependence and the level of influence of the factors affecting the volume of investment in special economic zones.

KEYWORDS

Special economic zone, investment, GDP, tax benefits, customs benefits.

The improvement and development of any activity is influenced by various indirect and direct factors. In particular, many social, economic, financial, legal, administrative and other changes have a positive or negative effect on the flow of investments into special economic zones and their types were considered in the above chapters and paragraphs of the research. It has been proven in the world experience that special economic zones contribute to the economic development of regions, create jobs, increase the volume of production, and make a significant contribution to the economic development of the country. Taking this into account, the government has been taking measures to establish special economic zones in Uzbekistan in recent years, to support them through the fiscal policy of the state and to stimulate the activities of such areas. On the basis of such measures, of course, by giving special tax benefits, by applying special procedures of production, by attracting more investment to the economy and production activities, and by effectively directing idle funds to development revitalization lies.

Above, consideration was given to attracting investment to special economic zones in Uzbekistan, the facilities and opportunities created in this regard were changed, and theoretical evaluations and comments were given. In this part of the research, we will study the econometric assessment and forecasting of the prospects of the positive or negative impact of tax incentives and other factors on the volume of investments in special economic zones. In this regard, we will carry out an econometric study to sort out the factors and explain them, to build an econometric model that shows the degree of interdependence and the degree of influence of the factors affecting the volume of investment in special economic zones. We evaluate the degree of dependence and the reliability of the econometric model through statistical tests and make forecasts based on the model.

Analysis and discussion of results

We perform and analyze econometric modeling using the method of least squares. The abstract view of the model is as follows:

$$Y= k_1x_1+ k_2x_2+...+ k_nx_n+b+e \ (1)$$

b – initial value of the model;
$k_1, k_2, \ldots k_n$ – coefficients in front of independent variables;
$x_1, x_2, \ldots x_n$ – independent variables;
Y – involuntary variable;
e – uncertainty part of the modeling

From the point of view that econometric analyzes are mainly carried out on the basis of long-term time series data or comprehensive observations, in the research we mainly select a statistical indicator of several factors affecting the volume of investment in special economic zones. We obtain the indicators of tax and customs benefits from the point of view of the direct impact of the tax benefits on the flow of investments into special economic zones. We also include the indicator of the volume of money in circulation as an influencing element for study from the perspective of direct participation of the public and business entities as investors.

The more tax and customs benefits are given, The more postitive effect it will indirectly have on the growth of profits from direct activities, based on which the interest of investors in this area will increase and they can make more investments. Secondly, the larger the mass of money in circulation, the more its part can be directed to investment. These mentioned factors may have an indirect effect on the volume of investment in special economic zones.

First, we describe descriptive statistics of the data of these indicators for the years 2008-2021 using the data of Appendix 1 in Table 1 below.

Table 1 Descriptive statistics of investments attracted to special economic zones and factors affecting their volume change

Indicator	Average	Median	Minimum	Maximum
I	215,66	57,840	15,720	791,34
SI	103,89	78,850	0,0000	563,20
BI	169,84	81,000	5,9000	884,40
M_2	38188,0	30175,0	3093,1	92264,5
Indicator	**Standard deviation**	**Variation**	**Asymmetry**	**Excess**
I	283,58	1,3150	1,1742	-0,27097
SI	138,87	1,3367	2,8069	6,9735
BI	279,21	1,6439	2,0191	2,2421
M_2	31538,0	0,82587	0,56762	-1,0583

In 2008-2021, the volume of investment in the special economic zones of Uzbekistan (I) is listed in million US dollars, its average is 215.66 , the minimum is 15.72 (2012), the maximum is 791.34 (2018), the standard deviation between the indicators was equal to 283.58. In our country, it is planned to provide tax incentives (SI) for enterprises opened in special economic zones, their amounts are listed in billion soums, the average annual amount of tax incentives is equal to 103.89, in 2020, the pandemic and other the amount of tax credits used under the influence of factors is equal to 0, the maximum is equal to 563.2, the standard deviation between the amounts of tax credits is equal to 138.87. The law also provides for the use of special customs privileges (BI) for special economic zones, the amounts of which are presented in billion soums in our analysis, in particular, the average of customs privileges is

169.84, the minimum is 5.9 (2008 -year), the maximum is 884.4 (2018), the standard deviation between the amounts is 279.21. The amount of money in circulation (M_2) is presented in the analysis in billion soums, its average amount is 38188, the minimum is 3093.1 (2008), the maximum is 92264.5 (2021), the standard deviation between the amounts is 31538.

The calculation and study of correlation coefficients, which show the degree of the connection between changes in factor sizes, is one of the earliest and most crucial steps in econometric analysis. It is known that the correlation coefficient evaluates the strength of the indirect relationship, and this relationship is in the range (-1;1). If the correlation coefficient between two factors is in the range (0;1), then there is a positive relationship between the factor quantities, if it is in the range (-1;0), then there is an inverse relationship.[2] The closer this indicator is to 1 or -1, the stronger the relationship, and the closer to 0, the weaker. The bond strength is conditionally very strong (|0.9;1|), strong (|0.7;0.9|), medium (|0.5;0.7|), weak (|0.3;0.5|), insignificant (|0.1;0.3|) are estimated at such levels.[3] In econometric modeling, it is advisable to choose factors with a correlation level greater than 0.7 and less than -0.7.

We describe the correlation coefficients between investments attracted to special economic zones and other factors in Table 2 below.

Table 2 Correlation coefficients between investments attracted to special economic zones and factors influencing it

I	SI	BI	M_2	Indicators
1,0000	0,2530	0,8106	0,8233	**I**
	1,0000	-0,1297	0,4788	**SI**
		1,0000	0,4689	**BI**
			1,0000	**M2**

Note: Calculations were made in Gretl software.

It can be seen from table 1 that the correlation coefficient between the volume of investments attracted to special economic zones (I) and tax benefits (SI) is equal to 0.253, which means that the relationship between the two factors is insignificant. The correlation coefficient between the volume of investments attracted to special economic zones (I) and customs benefits (BI) is equal to 0.8106, and the relationship between the two factors is strongly correlated. The correlation coefficient between the volume of investments attracted to special economic zones (I) and the mass of money in circulation (M_2) is equal to 0.8233, which indicates that there is a strong direct connection between the two factors. So, to build an econometric model, we take customs benefits (BI) and money supply (M_2) as influencing factors. The analysis of the correlation coefficients between the remaining factors shows that there is no problem of multicollinearity with the factors selected for our analysis.

At the next stage of the analysis, we will build an econometric model that shows the influence of customs preferences (BI) and money supply (M_2), which are strongly related to the volume of investments directly attracted to special economic zones (I). Based on the data of Appendix 1, we perform modeling analyzes in a special software package and present the optimal model obtained as a result of the analyzes in Table 3.

Table 3 The regression equation of the influence of factors on the volume of investments attracted to special economic zones in Uzbekistan

Factors	Coefficient	Standard error	t-statistics	P-value	Confidence level
const	−7,53710	1,74905	−4,309	0,0006	*
BI	0,962469	0,309559	3,109	0,0072	***
M_2	0,456435	0,221718	2,059	0,0573	***
The dependent variable's average		215,6579	Standard deviation		283,5821
sum of residuals' squares		95278,93	Standard error		93,06837
R-squared		0,908863	Adjusted R-squared		0,892292
F-statistics (4, 34)		54,84856	R-value (F)		1,90e-06
An indicator of logarithmic closeness to reality		−81,64369	Akaike criterion		169,2874
Schwarz criterion		171,2045	Hanna-Quinn criterion		169,1099
Parameter rho		0,314538	Darbin-Watson statistics		1,663127

Note: Calculations were calculated in the Gretl software complex.

In the econometric model:

Const – initial value of the model;

BI – customs benefits;

M_2 – money supply in circulation;

I – investments in special economic zones;

e – uncertainty part of the model.

Inductive analysis of the model: the indicator representing the statistical significance of the model (F-statistic) is less than 0.1 and is statistically significant with 99 percent accuracy, and the model is suitable for retention. The initial value of the model (const) is suitable for use with 90 percent accuracy according to Styudent's t-test. The coefficients indicating the influence of independent variables (BI and M_2) on the dependent variable are also less than 0.01 and they are also statistically significant with 99 percent certainty according to Styudent's t-test. So the model is suitable for use.

The coefficient of determination (adjusted R-squared) of the constructed model is equal to 0.8923, which means that the model can explain 89.23 percent of changes in the volume of investments (I) attracted to special economic zones. If the Darbin-Watson statistic, which assesses the absence of autocorrelation in the model, is in the range (1.5621; 2.4379), then autocorrelation does not exist. In our model, this indicator is equal to 1.6631 and gives the conclusion that there is no autocorrelation. When the residuals were checked for normal distribution, it was found that they were normally distributed.

Interpretive analysis of the model:

$$I = 0{,}9625BI + 0{,}4564M_2 + const + e \quad (2)$$

As we noted above, here Const is the initial value of the model, BI is customs benefits, M2 is the money supply in circulation, I is investments in special economic zones, e is the uncertainty part of the model. It was seen from the model that the correlation coefficients between independent variables (BI and M_2) and the volume of investments attracted to Special Economic Zones (I) and the connection in the model are mutually proportional.

The independent variable in the model is an increase (decrease) in the volume of customs benefits (BI) by 1 (one) billion soums, an increase (decrease) in the volume of investment (I) in special economic

zones by 0.9625 million US dollars, the mass of capital in circulation An increase (decrease) of (M_2) by 1 (one) billion soums leads to an increase (decrease) in the investment volume (I) in special economic zones by 0.4564 million US dollars.

CONCLUSIONS AND SUGGESTIONS

From this, the following conclusions can be drawn: it is desirable to encourage the increase of investment in special economic zones by applying customs benefits; The increase in the volume of money in circulation has a positive effect on the increase in the volume of investment in special economic zones.

Conclusion Each government determines its own definition of a special economic zone. Above all, companies may also be offered tax vacations, in which they are allowed a period of cheaper taxation after establishing themselves in a zone.

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