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STATISTICAL ANALYSIS OF EXPORT INDICATORS IN THE REPUBLIC OF UZBEKISTAN

Abdujalilova Bibisora Bakhodir kizi

Phd student of the Institute of Personnel Qualification

and Statistical Research of the Statistical Agency under

the President of the Republic of Uzbekistan

E-mail: abdujalilovab97@gmail.com

Abstract: In the research, the statistical analysis of export indicators in the Republic of Uzbekistan was studied. In the period from 2015 to 2022, the relationship between variable factors such as the volume of stock market turnover, the volume of investments in fixed capital and the volume of products of small business entities, and the volume of exports as a result factor was examined. In this study, empirical analysis using standard deviation, OLS regression models, and heteroscedasticity Pagan's test was performed on the stata panel and statistical significance was tested.

Key words: Foreign trade, export, stock exchange volume, investments in fixed capital, small business entities, foreign economic activity, standard deviation, OLS regression, heteroscedasticity.

Introduction

In accordance with the decision of the President of the Republic of Uzbekistan No. PQ-4707 of 2020 on measures to further support export activities, the Export Promotion Agency was established under the Ministry of Investments and Foreign Trade of the Republic of Uzbekistan. It is emphasized that mechanisms for providing financial support to exporting enterprises will be created to increase the volume of exports.

Today, in the conditions of intensifying competition in world markets, it is necessary to expand state support for exporters in order to penetrate new markets and strengthen their position in traditional markets by increasing the volume of product exports. The procedure for providing subsidies for up to 50% compensation of transportation costs in the export of products, as well as for the export of processed products under the "re-export" customs regime, and for providing subsidies for partial compensation of transportation costs in road, air, and rail transport for export, has been approved. . Also, when exporters use insurance services as collateral, compensations are provided by the Export Promotion Agency under the Ministry of Investments and Foreign Trade of the Republic of Uzbekistan to cover the insurance premium.

Exports are goods and services produced in one country and sold to customers in another country. The export of goods is the value of goods taken out of the economic territory of the country, as a result of which the material wealth of the residents of this country decreases. Export of services: services of industrial classification or consumer importance provided by residents to foreign partners (non-residents) for a certain fee. In this case, the provision of services in foreign economic

activity is a relationship between a resident and a non-resident, regardless of the place of its performance (rendering).

Deep positive changes are taking place in the structure of foreign trade. In particular, over the next few years, the trend of stable growth in the weight of competitive finished products and the decrease in the share of the products of raw material supply industries in the composition of exports are clearly visible. According to the analysis, as a result of measures to diversify exports and imports and improve their composition, there were positive changes in the product composition of our country's exports. All these indicators, first of all, the consistent increase in the share of competitive finished products with high added value in the composition of exports, first of all, indicate the growing potential and opportunities of our economy (A.V. Vakhabov, D.A. Tadjibayeva, and Sh.Kh. Khajibakiyev, 2015).

For developed countries, payments and receipts from foreign trade and their balances are not by themselves, but as one of the most important elements of the balance of payments, they are related to the export of capital and the expansion of financial capital beyond national borders or a number of other data that is of interest as an indicator (S.N. Bakulin, D.D. Mishutsin).

Literature review

Extensive reforms carried out in our country contribute to the rapid development of trade relations with foreign countries. Also, the decisions and decrees adopted to increase the volume of exports require local enterprises to learn more about the experiences of foreign countries. In recent years, the indicators of foreign trade in our country have increased significantly (Q. Isayev, 2021). According to the analysis, in 2019, the foreign trade turnover of the Republic of Uzbekistan was equal to 41,751.0 million US dollars, the FTT with the CIS countries was 14,461.8, and by 2022, the FTT was 50,061.5 million, reaching the US dollar. This year, the export total is 19,293.7 million US dollars. It increased by 124.7% in 2023 and by 110.6% as of June 2024.

The problem of estimating foreign trade turnover is one of the central issues in foreign trade statistics. Due to a number of important shortcomings and careless registration, the quantitative calculation of foreign legal trade turnover in countries is not very accurate. Achieving or even approaching the same level of precision with respect to the value expression of the mass of circulating merchandise is a more difficult task.

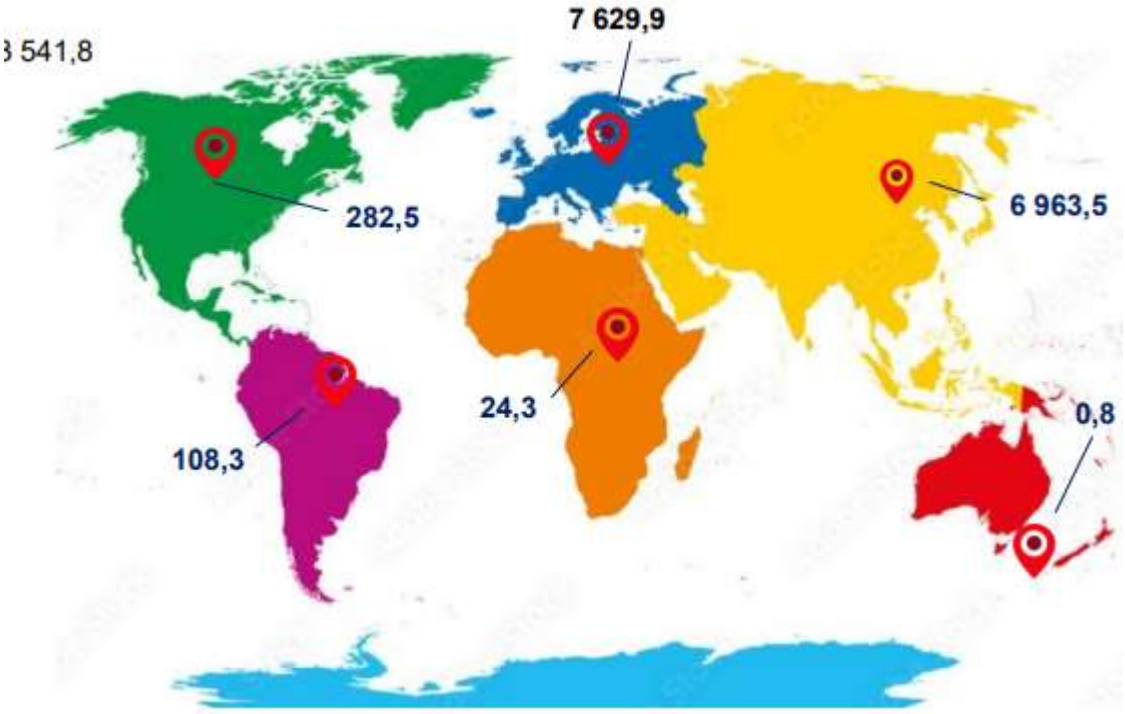
At the same time, the correct assessment of imports and exports, according to it, is of great practical importance for very understandable reasons because foreign trade turnover is one of the most important indicators of the state of the national economy in developed countries. Great importance is also attached to the ratio of import and export value, that is, the country's trade balance.

The greater the share of import and export transactions in the total mass of payments and receipts that make up the balance of payments, the greater the state of the trade balance for a given country. If exports exceed imports, the trade balance is active, and if import exceed export, it is passive. Trade surplus refers to the difference between the value of exports and imports. If there is an active part of the trade balance, the balance will be positive; otherwise, with a passive trade balance, the balance will be negative (S.N. Bakulin, D.D. Mishutsin).

The relationship between exports and the activity of firms has been widely studied in the literature. There are two competing (but not exclusive) hypotheses: the self-selection hypothesis and the learning-by-export hypothesis.

Although the former hypothesis has strong theoretical and empirical support (Bernard and Jensen, 1999; Melitz, 2003), studies using direct measures of knowledge flows and empirical evidence supporting the export hypothesis are still lacking (Atkin et al., 2017; Shu and Steinwender, 2019; Keller, 2021).

Foreign Trade Turnover in the section of the continents
(January -March 2024, million US dollars)



Europe FTT- 7629,9 mln.US dollar, Share-50,8%	Asia FTT- 6963,5 mln.US dollar, Share-46,4%	Africa FTT- 24,3 mln.US dollar, Share-0,2%
North America FTT- 282,5 mln.US dollar, Share-1,9%	South America FTT- 108,3 mln.US dollar, Share-0,7%	Australia FTT- 0,8 mln.US dollar, Share-0,01%

Figure 1.1. Intercontinental trade turnover.

Source. Stat.uz

Figure 1.1 shows the turnover of foreign trade between the Republic of Uzbekistan and the continents in January–March 2024. According to this, the FTT with Europe is equal to 7629.9 million US dollars, and its share is 50.8%. The share of foreign trade turnover with Asian countries is 46.4%, Africa's share is 0.2%, North America's share is 1.9%, South America's share is 0.7%, and Australia's share is 0.01%. Also, Australia FTT is equal to 0.8 million US dollars, Asia FTT is equal to 6963.5 million US dollars, and North American TSA is equal to 282.5 million US dollars. This shows a significant increase compared to last year.

Table 1
Share of CIS and other countries in foreign trade
(as a percentage of the total)

Year	**2019**	**2020**	**2021**	**2022**
Goods turnover with another country	100,0	100,0	100,0	100,0
CIS	34,6	32,6	37,8	39,9
Another	65,4	67,4	62,2	60,1
Export	100,0	100,0	100,0	100,0

with another country				
CIS	35,7	27,2	32,6	40,8
Another	64,3	72,8	67,4	59,2
Import with another country	100,00	100,0	100,0	100,0
CIS	33,9	36,5	41,1	39,3
Another	66,1	63,5	58,9	60,7

Table 1 shows the share of Uzbekistan in foreign trade with the CIS and other countries in percent between 2019 and 2022. If the turnover is 100%, the share of the CIS is equal to 34.6%, and by 2022, it will increase to 39.9%. Its share in exports was equal to 35.7% in 2019 and 40.8% in 2022. However, we can see that the share of other countries' turnover was 65.4% in 2019, but it will decrease in 2021–2021. In 2019, its share in exports was 35.7%, and by 2022, it had decreased by 5.1% compared to 2019.

Research methodology

An OLS regression model with multiple factor variables can be extended to include multiple factor variables by adding additional variables to the equation. Each variable up to ($\boldsymbol{x_1}$ ... $\mathbf{x_3}$) with the resulting factor y of the form of the model is shown.

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$$\boldsymbol{y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3}$$

The interpretation of the parameters (a and b) in the above model is essentially the same as in the simple regression model above, but now the relationship cannot be represented in a single scatter plot. a shows the value of y when all values of the explanatory variables are zero. Each b parameter represents the mean change in y associated with a unit change in x while controlling for other explanatory variables in the model. Model fit can be assessed by comparing the deviance indices of nested models. For example, the effect of variable x_3 on y in the model above can be calculated by comparing nested models.

$$\boldsymbol{y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3}$$
$$\boldsymbol{y = \alpha}$$

The significance of changes in deviance can be assessed by calculating the F statistic in an OLS regression model using the above equation.

Analysis and results

We conducted an econometric analysis based on the data collected during the research. Based on the data from stat.uz, in the period from 2010 to 2023, variable factors such as the volume of stock exchange turnover, the volume of investments in fixed capital, and the volume of products of small business entities in the Republic of Uzbekistan have an impact on exports as a result. In this study, panel standard deviation and OLS regression models were performed.

Table 2

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	8	2018.5	2.449	2015	2022
Export	8	101066.95	69772.748	30625.8	217779.5
Investment	8	150542.99	88483.754	44810.4	266240
The stock market	8	49315.1	44541.817	9467.9	137881.9
Small business	8	86849.175	36184.459	39643.5	143892.7

According to Table 1, the standard deviation is the sum of the average indicator factors divided by the total number of observations. The standard deviation is the square root of the variance. Shows how close the data is to the mean. This is the simple average of the root mean squared distance. Calculated (N in the table) indicates the number of factors for each variable. Range

is a measure of dispersion. It includes the difference between the largest and smallest values and the maximum and minimum values. Min, the lowest value in the variable 30625.8, was not calculated for export. Max, the largest value in the variable, is equal to 217779.5.

Table 3
Pairwise correlations

Variables	(1)	(2)	(3)	(4)
(1) Export	1.000			
(2)Investment	0.974*	1.000		
	(0.000)			
(3) The stock market	0.962*	0.902*	1.000	
	(0.000)	(0.002)		
(4) Small business	0.950*	0.952*	0.952*	1.000
	(0.000)	(0.000)	(0.000)	

**** p<0.01, ** p<0.05, * p<0.1*

In Table 3, the interaction of factors such as the volume of investments in export capital, stock exchange turnover, and the volume of products of small business entities was evaluated. Accordingly: Prob > F = 0.0000: This is the p-value of the model (significant at p<0.05). It shows the reliability of X to estimate Y. . R-squared = 0.994: R-squared indicates what share of the variation of variable y is taken into account in the model, and this share is conditioned by the influence of variable x on it. shows the amount of variance in y. In this case, it shows that the even coefficient of determination is 0.994. A 1% increase in the estimated coefficient of fixed capital investment leads to an increase in exports of 0.614. Investments in fixed capital, stock market turnover, and the coefficient of production of small business entities have a positive effect. Reliability was tested using Fisher's common test and was found to be statistically significant.

Table 5
Linear regression

Export	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Investement	.614	.1	6.15	.004	.337	.891	***
The stock market	1.028	.198	5.19	.007	.479	1.578	***
Small business	-.804	.346	-2.33	.081	-1.763	.155	*
Constant	27708.696	13732.399	2.02	.114	-10418.557	65835.948	

Mean dependent var	101066.950	SD dependent var	69772.748
R-squared	0.994	Number of obs	8
F-test	223.402	Prob > F	0.000
Akaike crit. (AIC)	167.065	Bayesian crit. (BIC)	167.383

**** p<.01, ** p<.05, * p<.1*

Figure 1.2 shows scatterplots. Accordingly, each point is significant if the value of the variable is close to the regression line. This chart shows a positive correlation between the volume of fixed capital investment, stock exchange turnover, and individual exports of small production entities. As investment increases, exports also tend to increase, indicating that investment in fixed capital can lead to export growth. This indicates that the more products produced by small business

entities, the higher their export volume, which emphasizes the important role of small enterprises in the export sector.

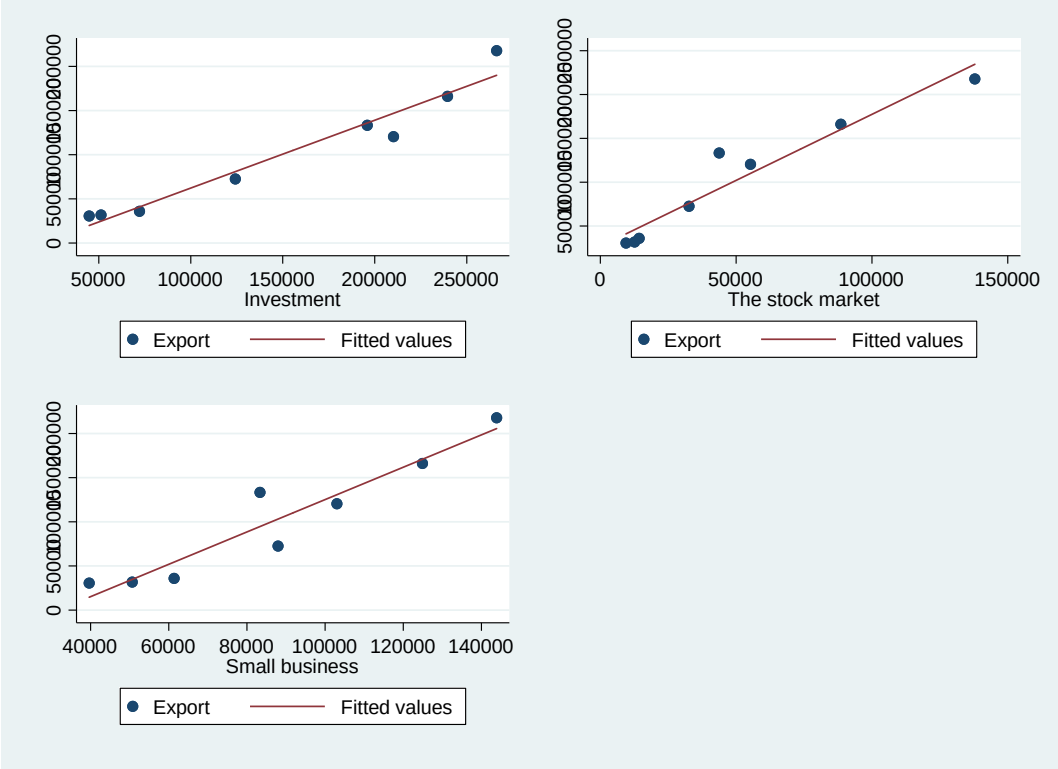

Figure 1.2 Twoway scatterplot

Table 5

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of Export

chi2(1) = 0.20

Prob > chi2 = 0.6573

The null hypothesis H for the heteroscedasticity test in Table 5 is that there is constant variance in the random errors (no heteroskedasticity). The chi-square statistic is 0.20, and the p-value is 0.6573. Since this p-value is not less than 0.05, there is no statistical evidence to reject the null hypothesis H. This indicates that the residuals have a constant variance, indicating that heteroskedasticity does not exist.

Conclusion and recommendation

In conclusion, the analysis of export indicators for the specified period shows a delicate picture of the dynamics of international trade for the region. First, consistent growth in export volume indicates strong production capabilities and successful entry into new markets. This increase has a positive effect on the economic status of exported goods. In this research work, the influence of variable factors such as the volume of stock exchange turnover, the volume of investments in fixed capital, and the volume of products of small business enterprises in the Republic of Uzbekistan on export was expressed and its reliability was checked. In particular, the diversification of product

types and expansion into new geographic markets contributed significantly to increasing the stability of the export sector. It is noteworthy that while some industries have shown significant growth, others remain stagnant. Moreover, compared to other regions, our analysis shows competitive or superior performance, suggesting effective use of regional advantages and trade agreements. Despite these positive aspects, a detailed examination of growth rates and market dependencies also reveals areas of weakness. A heavy dependence on certain markets or types of goods can be a risk if those markets suffer an economic downturn or trade barriers arise. Continuous monitoring of global economic trends, competitor activities, and technological advances will be critical to maintaining competitive advantage and ensuring long-term sustainability.

Investments are being made in research and development to improve the quality of export goods and develop new products that meet the changing preferences of global consumers. The simplification of logistics and customs processes is desirable to increase the efficiency of export operations, reduce costs, and improve delivery times.

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