



Statistical Analysis of The Impact of Foreign Trade on The Economy on The Republic of Uzbekistan

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Abstract

The article analyzes the economic factors affecting the export and import of goods, gives a statistical assessment of the features of foreign trade and economic situations in Uzbekistan in modern conditions. The analysis and conclusions from the study carried out are important for drawing lessons for the future. Foreign economic activity, in particular the result of the foreign trade policy implemented in the country, will directly affect the growth of the country's economy.

Keywords: foreign economic activity; export, import; dynamics, structure; statistics; correlation and regression analysis.

1. Introduction

Foreign trade plays an important role in the economy of the republic. The successful development of foreign trade is an important source of capital inflow into the country, providing the population with the necessary goods, and the manufacturing sector with the necessary resources. Along with internal factors, external factors such as exports, imports, foreign direct investment, transfers, etc. are of great importance for ensuring economic growth. For small countries, such as Uzbekistan, limited domestic demand cannot be the basis for long-term economic growth, therefore external demand is of great importance for ensuring sustainable economic growth, that is, exports and imports become one of the main possible factors. Statistical analysis of Uzbekistan's foreign trade indicators makes it possible to determine the trends, structure and dynamics of foreign trade commodity flows in close connection with macroeconomic indicators and world market conditions.

2. Literature Review

The volume and intensity of export-import trade flows within this network can be considered as an indicator of the degree of involvement of countries in international trade relations. Therefore, the factors that determine the economic parameters of export-import flows are of considerable practical interest.

For empirical analysis of the influence of these factors on the parameters of trade flows, the so-called gravity model of trade is widely used. It is based on the assumption that the level of interaction between two countries, measured by the value of exports from one country to another, is proportional to the product of indicators characterizing the economic size of these countries and inversely proportional to the costs of trade between them [Anderson, Wincoop, 2003; Combes, Mayer, Thisse, 2008]. This model has received well-

deserved recognition due to its success in predicting bilateral trade flows of goods in various situations [Deardorff, 1984; Leamer and Levinsohn 1994].

Altomonte și Pennings (2005) analyze some characteristics of the foreign direct investments. Anghelache (2016), Dougherty (2007), Corbae, Durlauf and Hansen (2006), Anghelache, Anghel and Manole (2015) describe econometric, financial and IT instruments that can be used in economic analyses, Radu (2011) focuses on the use of econometric instruments in the financial management. Anghelache, Anghel and Sacală (2014) analyze the evolution of the Gross Domestic Product of Romania, Dumitrescu, Anghel, and Anghelache (2015) focus on the dependence of this macroeconomic indicator on structural variables. Zaman and Georgescu (coord., 2015) are preoccupied with the regional aspects of Romania's economic development.

DATA and Methodology

In the course of research, scientific methods of studying the processes of economic reality were used - experimental research, generalization, grouping, logical and comparative methods of analysis, abstract-logical thinking, comparative analysis, statistical analysis, perspective forecasting and accounting methods.

RESULTS AND DISCUSSION

Foreign economic activity, in particular the end result of the foreign trade policy implemented in the country, will directly affect the standard of living of the population.

Government reforms carried out in recent years and aimed at stimulating exports, optimizing imports and, in general, the policy implemented in the country in order to achieve a balance in foreign trade, ensured the growth of foreign trade turnover (hereinafter referred to as the FTT) of the republic (Fig. 1).

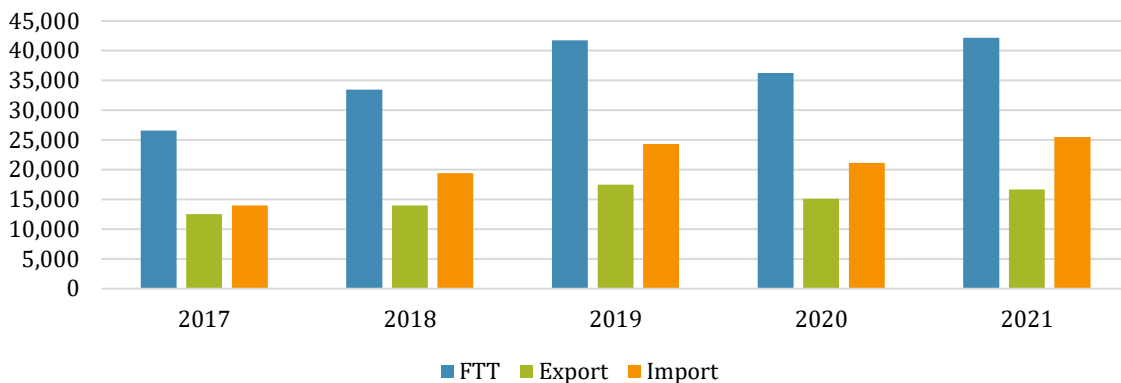


Figure 1: Foreign trade turnover of the Republic of Uzbekistan (million US dollars)

As can be seen from the diagram above, at the end of 2021, the foreign trade turnover of the republic amounted to 42.2 billion US dollars and increased by 15.6 billion US dollars, or 58.7% more than in 2017. Such a result in the history of the country is recorded as the highest figure. It is important to note that the ratio of foreign trade turnover to GDP is also growing significantly, which indicates the growth of the economy in terms of trade.

Uzbekistan has trade relations with more than 183 countries of the world. The largest volume of its foreign trade turnover among them was recorded with the Russian Federation (17.9%), China (17.7%), Kazakhstan (9.3%), Turkey (8.1%), the Republic of Korea (4.5%), Kyrgyzstan (2.3%) and Turkmenistan (2.1%).

In addition, there is a strengthening of relations with neighboring states, a lot of work is being done to develop relations in the socio-economic, commercial, industrial and cultural spheres with these countries.

In particular, in recent years there have been significant changes in the FTT with neighboring states, such as Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan. Thus, over the past five years, the FTT with Turkmenistan has increased 5.1 times, Kyrgyzstan - 3.8 times, Tajikistan - 2.5 times, and with Kazakhstan - 1.9 times.

One third of the FTT volume falls on the CIS countries and in recent years there has been a downward trend in this indicator. This, in turn, testifies to the expansion of foreign economic relations with other foreign partners (Fig. 2).

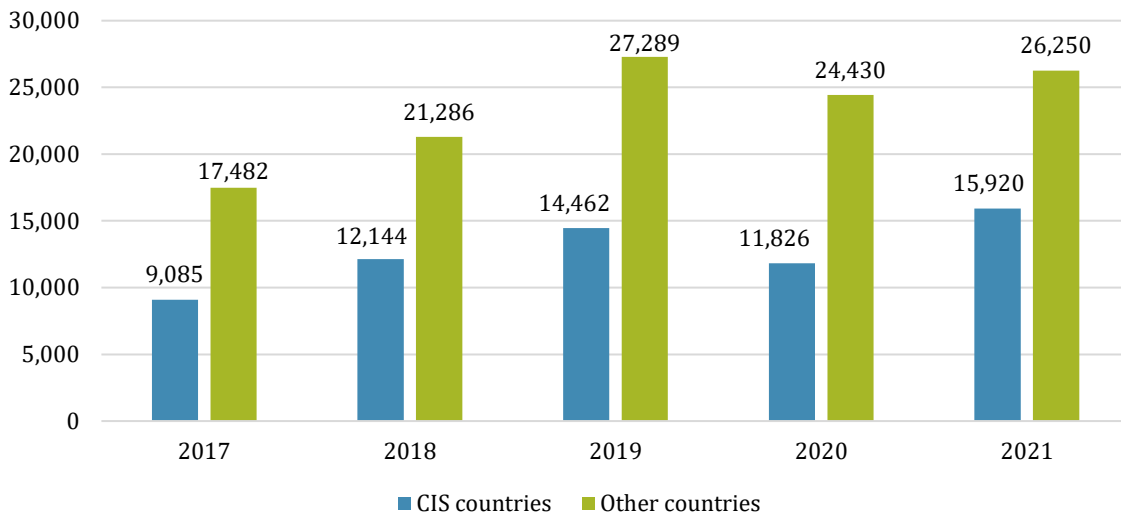


Figure 2: Dynamics of the volume of the CIS countries and other foreign countries in the foreign trade turnover of the Republic of Uzbekistan (million US dollars)

As a result of the measures taken by the government of the republic to strengthen cooperation with the CIS countries and comprehensive support for foreign trade, the growth rate of foreign trade turnover of the CIS countries, compared to 2017, increased by 1.7 times and their share in foreign trade turnover, at the end of 2021, amounted to 37.8%.

Export of goods and services

As you know, the development of international economic relations contributes to the sustainable economic growth of exports in order to achieve certain results. The reforms implemented to increase the country's export potential, state support for exporters and expansion of the range of export-oriented products, allowed to increase the number of exporters by more than 6.5 thousand units, and this ensured that the volume of exports reached 16.7 billion US dollars (growth, compared to 2020, reached 10.3%) (Fig. 3).

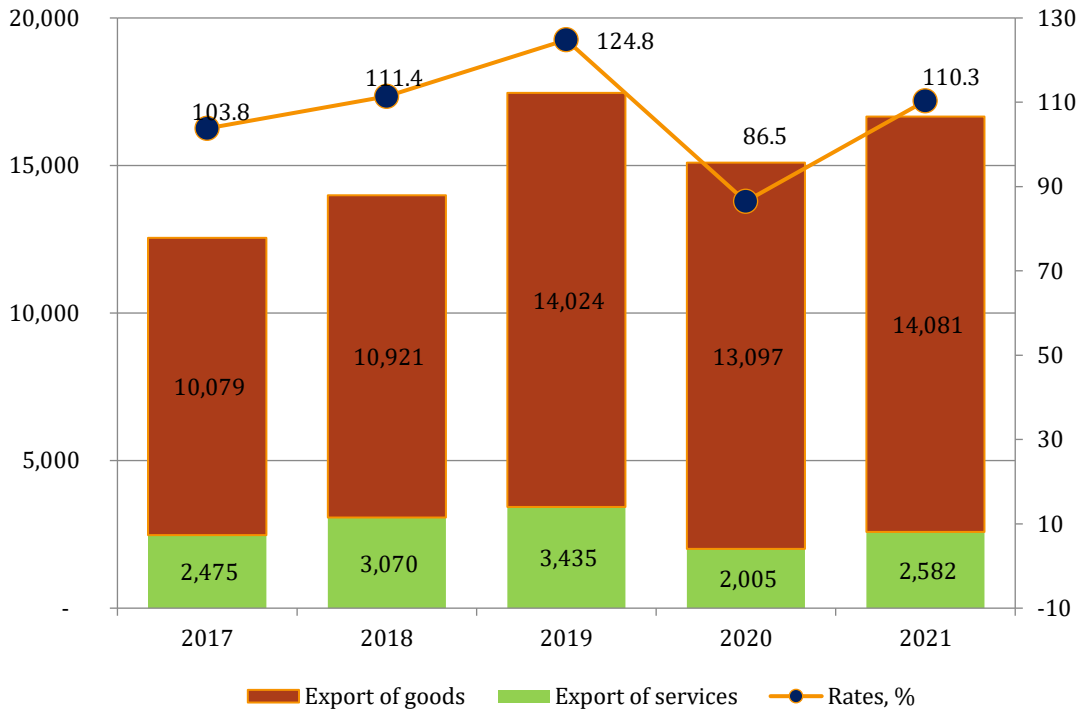


Figure 3: Dynamics of export volume of the Republic of Uzbekistan (million US dollars)

As you know, the main driver of growth is the export of goods, while the level of exports of services is more or less stable. In the structure of exports, goods account for more than 84.5% of its total volume (Fig.4).

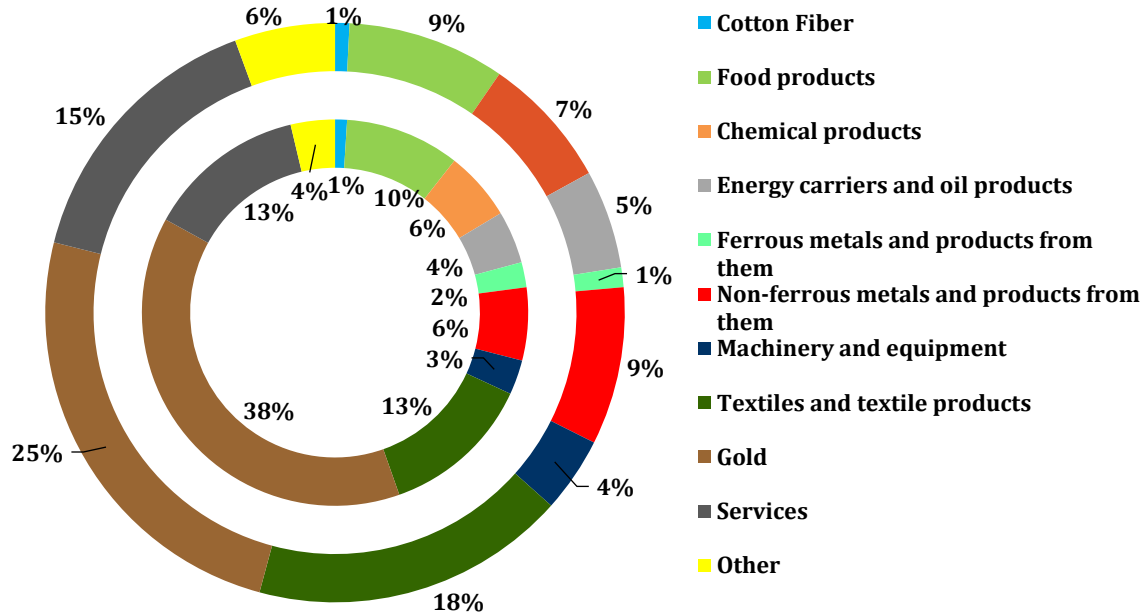


Figure 4: Export structure (2020 is the inner circle and 2021 is the outer circle)

In the structure of exports, 84.5% is occupied by goods that mainly fall on precious metals (including silver) (24.7%), textiles (17.6%), food products (8.8%) (mainly fruit and vegetable products (5.7%)), non-ferrous metals and products from them (8.8%), chemical products (7.4%), as well as energy carriers and oil products (5.5%).

Over the past five years, there has been a dynamic diversification of the export structure. Thus, the share of textiles and textile products increased by 10.0% - points, non-ferrous metals and products made from them - by 4.2% - points, food products - by 3.1% - points, machinery and equipment, including parts and accessories - by 2.4% - points.

Another trend is the decrease in the share of cotton in exports from 5.3% in 2016 to 0.8% in 2021. For comparison: in 2010, the share of cotton was 12.1%. This is the result of reforms in the production of finished products and value added, which, in turn, reduced the export of raw cotton as a raw material. In addition, the government pays special attention to the development of agriculture and horticulture, as a result of which the quality and volume of exported goods increase from year to year. This led to an increase in the share of fruit and vegetable exports from 4.6% in 2016 to 5.7% in 2021.

It should also be noted that over the past five years, the share of energy products in total exports has significantly decreased. Thus, if in 2016 the share of energy carriers was 14.2%, then over five years this indicator decreased by 8.7% points, i.e. up to 5.5%. This is due to the fact that the government is taking measures to reduce the export of natural gas and its full processing within the country, as well as to expand the production of value-added products.

Export of services

The volume of exports of services in 2021 amounted to 2.6 billion US dollars or 15.5% of the total volume of trade exports and increased by 28.8% compared to 2020. As part of the export of services, the highest share is occupied by transport services (67.6%), travel (tourism) (16.3%), telecommunications, computer and information services (7.0%), as well as insurance services (1.1%).

At the same time, other services (8.0%) account for the largest share, respectively, of other business services (5.2%), financial services (1.1%), maintenance and repair services (0.5%), etc.

Tourist services have increased due to active government measures to develop tourism, for example, citizens from 90 countries can travel to Uzbekistan without visas. This source of exports was 546.9 million US dollars in 2017 and peaked in 2019 at 1.3 billion US dollars. At the same time, in 2020, tourism services were negatively affected by the active spread of coronavirus infection (COVID-19) around the world, when borders were closed, and movement restrictions were introduced even within the country.

Against the background of the stabilization of the spread of coronavirus infection (COVID-19) and the gradual lifting of restrictive measures in 2021, the export of tourism services reached 422.1 million US dollars and increased by 65%, or 166.3 million US dollars, compared to 2020 (Fig. 5).

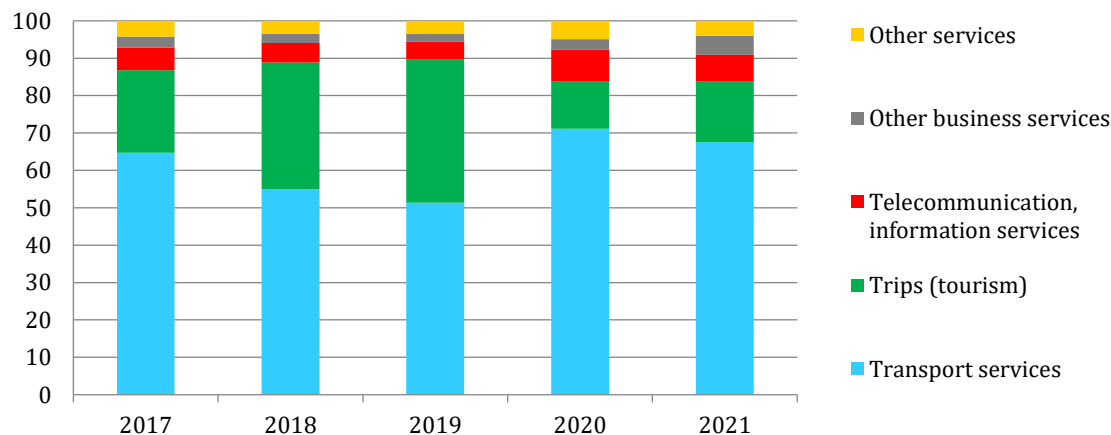


Figure 5: Dynamics of the structure of exports of services, %

Main export countries

Our main partners in the export of goods and services in foreign trade turnover are seven countries, whose share in 2021 in total exports amounted to 56.7%. Among the seven major partner countries for the export of

goods and services, such countries as China (15.2% of total exports), the Russian Federation (12.5%), Turkey (10.2%), Kazakhstan (7.1%), Kyrgyzstan (4.8%), Afghanistan (4.0%) and Tajikistan (3.0%). The largest volume in the composition of exported goods among large partner countries is textiles and textile products (26.3%), non-ferrous metals and products from them (13.6%), food products (13.1%), as well as energy carriers and oil products (9.4%) (Fig. 6).

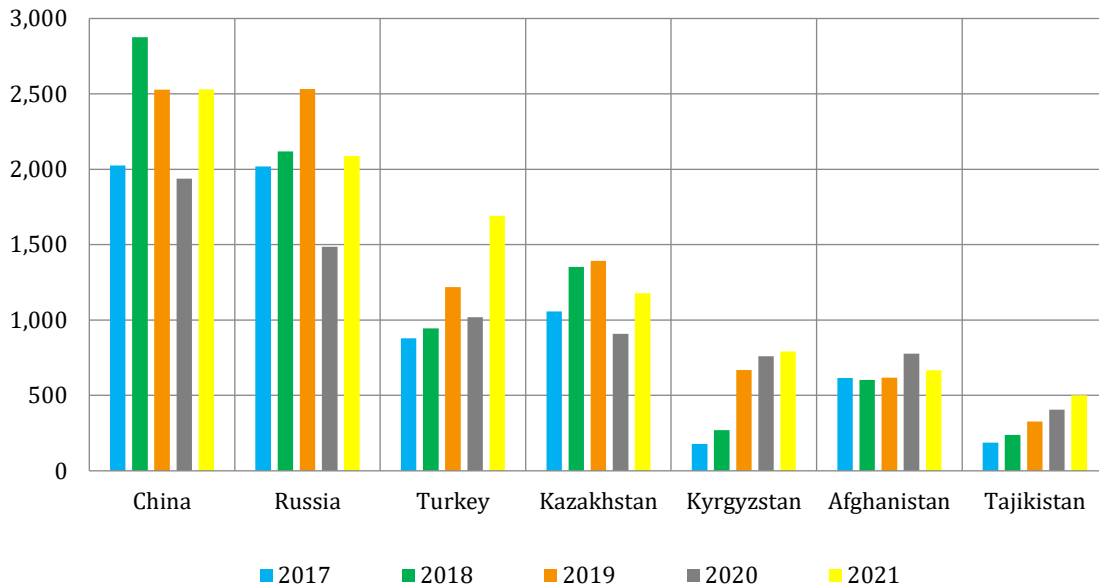


Figure 6: Top seven countries in the export of goods and services (million US dollars)

The geography of partner countries in the export of goods and services, compared to 2017, decreased from 174 to 183 countries. However, the commodity nomenclature increased by 1 416 units and, in general, amounted to 3 669 commodity items.

Import of goods and services

Despite the reforms implemented in the country in the field of stimulating import substitution and localization of production, in recent years there has been an increase in imports. For example, over this period it amounted to 25.5 billion US dollars (growth rates, compared to 2020, reached 120.5%) with a 1.8-fold increase compared to the year of national currency liberalization (Fig. 7).

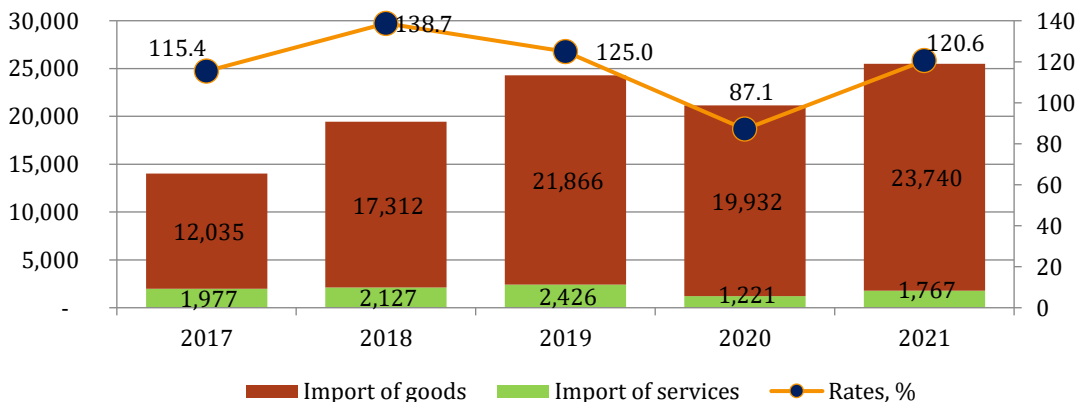


Figure 7: Dynamics of the volume of imports of the Republic of Uzbekistan (million US dollars)

Imports of goods reached 23.74 billion US dollars, services - 1.77 billion US dollars. The main driver of growth is the import of goods, while the level of imports of services is more or less stable.

The main share in its structure is occupied by machinery and equipment, including parts and components (37.1%), chemical products and products from it (16.7%), as well as food products (11.5%).

As the investment climate in the country improves and as a result of the reforms being implemented in this area, the growth of imports of machinery and equipment is natural. It is important to note that the increasing volume is a reflection of the government's policy of industrialization, as well as active reform to support foreign direct investment in the creation, modernization and expansion of production capacity (Fig. 8).

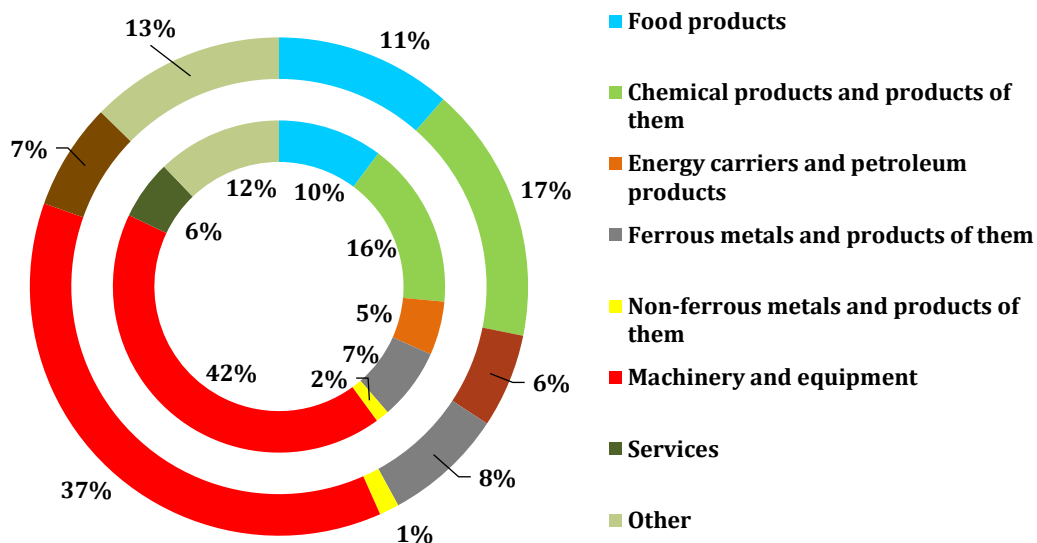


Figure 8: Import structure

(2020 is the inner circle and 2021 is the outer circle)

In general, despite the overall increase in the volume of imports of all goods, there is a decrease in the share of machinery and equipment and their parts in the total volume of imports. Despite the absolute growth over five years (1.8 times) in the volume of imports of services, in recent years there has been a decrease in their share from 14.1% in 2017 to 6.9% in 2021 (a decrease of 7.2% - points).

The main factor in the growth of imports is the demand for machinery and equipment, their share in total imports reached 37.1% (over the past five years, the growth of this share amounted to 1.0% points), which, in turn, is the most important component for investments attracted to the country.

Another significant part of imported products is chemical products and products from them, as well as food products, which account for a total of 28.2%.

Services import

The volume of imports of services for 2021 amounted to 1.8 billion US dollars, or 6.9% of its total volume, and increased by 44.7% compared to 2020.

As part of the import of services, the main share is occupied by travel (tourism - 50.2%), transport services (11.9%), other business services (10.3%) and telecommunications, computer and information services (8.1%). In addition, the share of other services accounted for about 19.5% of total imports of services, including a high share of other business services (10.3%), construction services (7.7%), fees for the use of intellectual property (4.6%), as well as maintenance and repair services (3.3%), etc (Fig. 9).

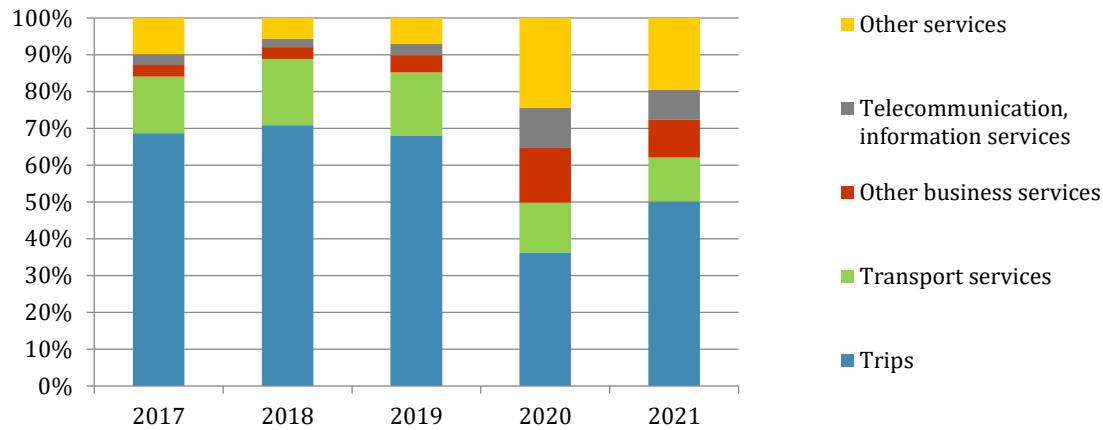


Figure 9: Dynamics of the structure of imports of services
 Along with this, quarantine restrictions imposed during the 2020 pandemic have significantly affected the service sector.

Thus, in 2020, as a result of restrictions on the transit of international transportation by countries of near and far abroad, the import of transport services decreased by 2.5 times and amounted to 165.6 million US dollars. At the same time, compared to 2017, the import of some services increased. In particular, the import of telecommunications services reached 142.5 million US dollars (2.4 times increase), as well as maintenance and repair services increased 2.8 times and amounted to 58.4 million US dollars.

Key importing countries in Uzbekistan

Imports to Uzbekistan are less concentrated than exports. Our main partners in the import of goods and services in foreign trade turnover are seven countries, whose share in total imports in 2021 amounted to more than 70.9 %.

Among the seven major partner countries for the import of goods and services are such countries as the Russian Federation (21.4% of total imports), China (19.3%), Kazakhstan (10.8%), the Republic of Korea (7.2%), Turkey (6.7%), Turkmenistan (2.8%) and Germany (2.7%). Over the past five years, in terms of imports of Uzbekistan, China and Russia are in the top seven, sometimes changing first and second positions. The largest volume in the composition of imported goods among large partner countries is machinery and equipment, including parts and accessories (39.0%), chemical products and products from them (13.9%), food products (10.7%), ferrous metals and products from them (9.3%), as well as energy carriers and oil products (8.0%) (Fig. 10).

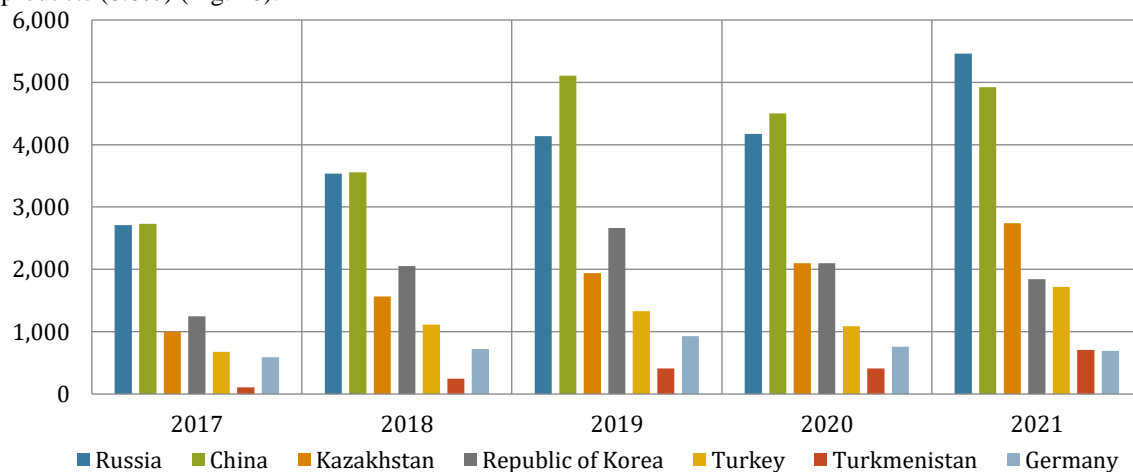


Figure 10: Top positions of seven countries in terms of imports to Uzbekistan (million US dollars)

The geography of partner countries for the import of goods and services, compared to 2017, increased from 147 to 157 countries, the product range - by 764 units and, in general, amounted to 7 390 commodity items. Thus, it becomes obvious that as a result of large-scale reforms in the foreign economic activity of the Republic of Uzbekistan and strong ties with the countries of the world, the export potential of our state is growing.

Along with this, thanks to the creation of favorable conditions, the provision of a number of tax and customs benefits to manufacturers, exporters, as well as in connection with the modernization of industrial capacities and the production of competitive products, prerequisites arise for increasing the volume of exports of national products, which, in turn, allows domestic products to take strong positions in foreign markets.

RESULTS OF CORRELATION-REGRESSION ANALYSIS OF FOREIGN TRADE AND ITS IMPACT ON GDP

In addition to absolute economic and statistical indicators, relative ones are often used, so we calculate the import-export coverage ratio (export/import). This indicator belongs to the category of relative coordination values and answers the question to what extent the volume of exports exceeds the volume of imports or how many units of exported goods per unit of imported goods (Fig. 11).

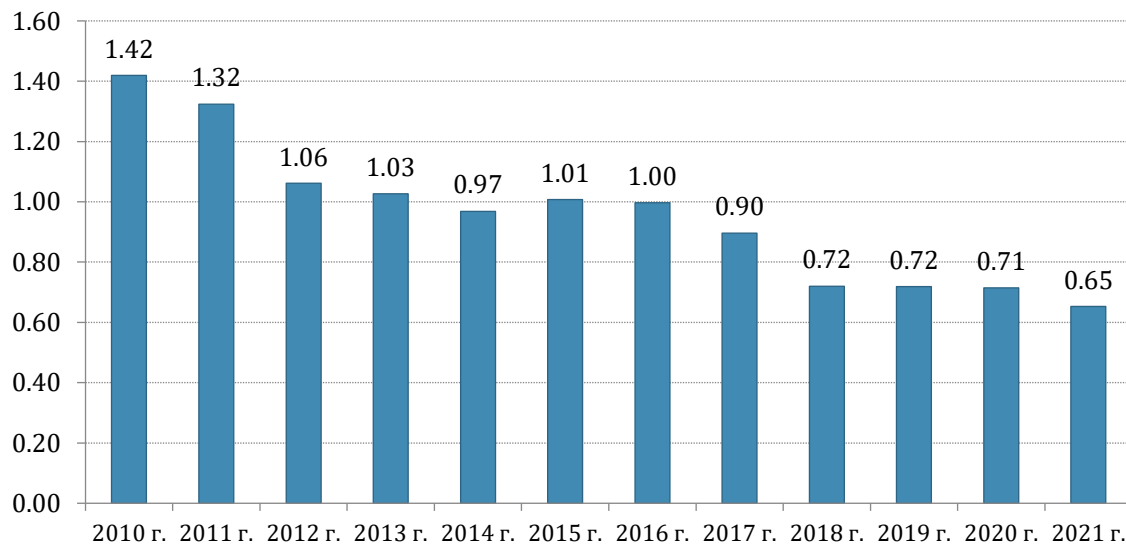


Figure 11: Dynamics of the coverage ratio of imports by exports to Uzbekistan, coefficient

According to the data presented, one can see a decrease in the dominance of exports over imports, while the gap has been narrowing in recent years. When exports exceed imports, the import-export coverage ratio will be greater than one. This indicates that the country has a trade surplus.

When exports are less than imports, the import-export coverage ratio will be less than one. This indicates that the country has a trade deficit.

Along with the selected coefficient, one can resort to a correlation-regression analysis and evaluate the impact of export-import on the GDP of Uzbekistan.

As a performance indicator (Y), we will take the gross domestic product, trillion soums for the period 2010-2021.

Factor signs are:

X1 — export of goods and services, mln. dollars;

X2 - import of goods and services, mln. dollars.

To do this, refer to Table. 1, which presents the values of the linear correlation coefficient.

Table 1: Matrix of paired correlation coefficients between GDP and export-import transactions

Indicators	GDP, trillion soums (Y)	Export of goods and services, mln. dollars (X1)	Import of goods and services, mln. dollars (X2)
GDP, trillion soums (Y)	1		
Export of goods and services, mln. dollars (X1)	0,641	1	
Import of goods and services, mln. dollars (X2)	0,946	0,804	1

According to the information presented, imports show a strong and exports show a medium direct relationship with the GDP of the analyzed country, which is expected, since the country's import activity has a high impact on its GDP, given that it is expressed in soums, exchange rates and inflation rates. The results of the regression analysis are presented in Table 2.

Table 2: Model Summary

Indicators	Values
Multiple R	0,967
R-square	0,934
Adjusted R-square	0,920
Standard error of the estimates	60794,62
Number of Observations	12
Durbin Watson test	1,263

ANOVA

Model	df	Sum of squares	Mean Square	F	Sig.
Regression	2	4,73696E+11	2,36848E+11	64,082	0,000
Residual	9	33263875518	3695986169	-	-
Total	11	5,0696E+11	-	-	-

Coefficients

	Coefficient	Std.error	t	Sig.	VIF

(Constant)	156043,006	198285,006	0,787	0,452	-
X ₁	-43,715	18,633	-2,346	0,044	2,855
X ₂	48,831	5,781	8,446	0,000	2,855

The model of the impact of exports and imports on GDP is as follows:

$$Y = 156043,006 - 43,715 \times X_1 + 48,831 \times X_2$$

The adequacy of the model is checked using the calculation Fisher's F-criterion. $F_{table}=4.26$, $F_{fact}=64.082$. Therefore, $F_{fact} > F_{table}$, the null hypothesis is rejected and the equation is statistically significant ($0.000 < 0.05$). The coefficients of the model, except for the Y-intersection, are significant: the value of their t-statistics (0.787 for b_0 ; -2.346 for b_1 ; 8.446 for b_2) have P-value, much less than the 0.05 level, and they are greater in modulus of the table value $t=2.26$.

The coefficient of multiple correlation $R=0.967$, which indicates a direct close relationship of features. Determination coefficient $R^2=0.934$. It shows that 93.4% of the variation in gross domestic product in Uzbekistan for 2010-2021. due to the variation of factors X_1 and X_2 .

Let's compare graphs of actual observations and theoretical ones (Fig. 12).

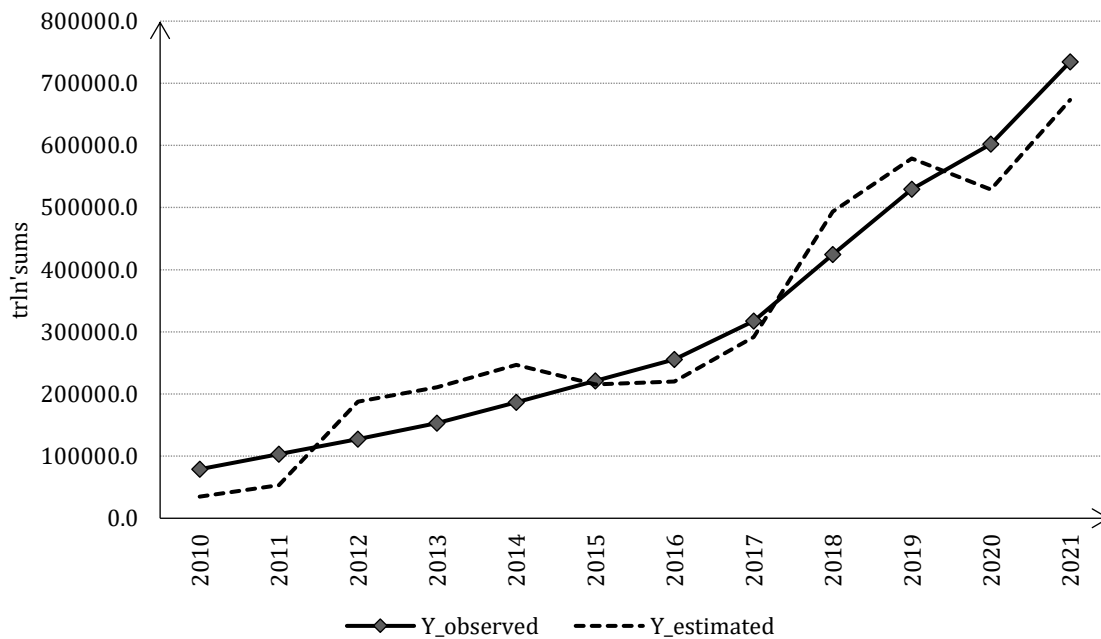


Figure 12: Comparison of actual observations and theoretical data of GDP

The coefficients for the factors in the model indicate a significant role of foreign trade in GDP in Uzbekistan:

- an increase in X_1 by 1 million dollars is accompanied by a decrease in GDP by 43.715 trillion soums,
- an increase in X_2 by 1 million dollars is accompanied by an increase in GDP by 48.831 trillion soums.

Calculate the average coefficients of elasticity to determine relative strength of X_1 , X_2 influence on Y .

$$\overline{E_{YX_j}} = b_i \frac{\overline{X_i}}{\overline{Y}}$$

$$\overline{E_{YX_1}} = b_1 \frac{\overline{X_1}}{\overline{Y}} = -43,715 * \frac{14156,9412}{311254,1838} = -1,988312822$$

$$\overline{E_{YX_2}} = b_2 \frac{\overline{X_2}}{\overline{Y}} = 48,831 * \frac{15852,3102}{311254,1838} = 2,48698395$$

With an increase in exports of goods and services by 1% of its average level, the average level of GDP decreases by 1.99%, with an increase in imports of goods and services by 1%, the level of GDP increases by 2.49%.

Conclusion

According to the results of analyzes carried out during 2010-2021, we can observe that in the case of the Republic of Uzbekistan, exports are inversely related to the country's GDP, while imports are positive. We can explain this situation in the following way. It is known that Uzbekistan has been exporting a large amount of raw materials such as cotton, oil, natural gas for many years. As mentioned above, due to the effectiveness of government measures aimed at reducing the export of products such as cotton, natural gas, energy products and increasing their full processing within the country, as well as the production of value-added products, these reductions in the volume of exports have a positive impact on the economy. countries. It can be noted that the main factor in the growth of imports is the increase in imports of machinery and equipment, which is one of the most important components for attracting investments, as well as for processing raw materials and developing production. And this situation has a positive effect on the growth of the country's GDP.

It should be noted that the impact of high inflation is also present, given that the country's GDP is expressed in national currency (trillion soums), and the volume of imports and exports is in dollars (million dollars). Countries with high levels of imports should increase their foreign exchange reserves.

It is known that, in general, an increase in exports in a country causes an increase in its GDP, and an increase in imports, on the contrary, leads to a decrease in GDP. But for some countries, especially if it is a commodity exporting country, an increase in its size can have a negative impact on the country's economy. Targeted imports, on the other hand, lead to an increase in production in that country, which in turn increases the possibility of exporting finished products. These results require a deep analysis of the impact of exports and imports on the country's economy and the development of research in this area.

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