World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 58, May, 2026
ISSN: 2749-3628,

ECONOMETRIC ANALYSIS OF CUSTOMS FEES AND THE FACTORS INFLUENCING THEM

Jurayev Jonibek Javliyevich,
Independent researcher of Customs Institute of Customs Committee,
Tashkent, UZBEKISTAN
e-mail: jurayevjonibek1987@gmail.com

Article history:

Received: 10th March 2026
Accepted: 8th April 2026

Abstract:

This scientific article presents an econometric analysis of customs fees collected by customs authorities and the factors influencing them. Based on the results of the research, scientific proposals and practical recommendations are provided.

Keywords: customs fees, privileges, foreign trade turnover, import volume, trend model, econometric models, dependent variable, independent variables

INTRODUCTION

Customs fees are considered one of the important economic instruments for increasing state budget revenues. Their essence is primarily determined by their role in regulating foreign economic activity by the state, protecting the national market, and forming budget revenues. Through customs fees, a certain order and control are established in the process of carrying out foreign trade operations, which plays an important role in ensuring the economic interests of the country.

According to the Decree of the President of the Republic of Uzbekistan 16.02.2026 y. № DP-21 "On additional measures to consistently continue reforms and bring them to a new stage within the framework of priority directions of the country's development until 2030" was approved. In Section II of this strategy, entitled "Ensuring Public Welfare through Sustainable Economic Growth," Goal 46 — "Ensuring Fiscal Stability and Effective Management of State Obligations" — was identified as one of the key objectives. In particular, the task of "ensuring that the share of customs revenues in gross domestic product remains at no less than 4.4 percent through the improvement of customs administration" was established [1].

In this context, analyzing the factors affecting the efficiency of customs fee revenues is of great relevance not only for optimizing economic policy, but also from the perspective of modernizing customs services and adapting them to international trade processes.

LITERATURE REVIEW

It should be noted that B.Yu. Khodiev, T.Sh. Shodiev, and B.B. Berkinov, among the scientists of our country, conducted research on econometric modeling of economic development [3–4] and Yu. Mukhamedov's factors and econometric models of sustainable socio-economic growth [5].

According to the young economist scholar O. Sarmanov, "In Uzbekistan, the efficiency of customs revenue collection is mainly influenced by factors such as import volume, customs tariffs and exchange rates. In his opinion, the growth of import volume, in particular, is the decisive factor in increasing customs revenue collections. At the same time, the interrelationship between tariff rates and macroeconomic indicators is also of significant importance. The author substantiates the necessity of applying scientific approaches based on econometric analysis in order to improve the efficiency of the customs system" [6].

In a study conducted by O. Sarmanov together with co-authors, the economic essence of customs privileges and preferences, their impact on foreign economic activity and issues related to improving their effectiveness were analyzed. According to the author, "customs privileges are an important instrument for stimulating foreign trade volume, improving the investment climate and supporting entrepreneurship. However, if purposefulness and efficiency are not ensured in their application, they may negatively affect state budget revenues" [7].

In the research conducted by local economist scholars T. Pardaev and O. Sarmanov, the issues of improving the processes of calculating and collecting customs fees were extensively analyzed, and the necessity of optimizing them based on international standards was substantiated. According to the authors, "customs fees should be determined in accordance with the costs of the services provided, and it is important to increase transparency and efficiency through the introduction of digital technologies" [8].

RESEARCH METHODOLOGY

In the course of this study, methods such as scientific observation, tables and graphs, correlation analysis,

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 58, May, 2026
ISSN: 2749-3628,

regression analysis, statistical grouping, and comparison were employed.

ANALYSIS AND RESULTS

The use of econometric methods in studying customs fees collected for the state budget serves to enhance the quality of financial and economic analysis and to formulate scientifically grounded recommendations for improving customs policy. This article focuses specifically on the construction and analysis of an econometric model reflecting the dependence of customs fee volumes on key macroeconomic and foreign trade indicators.

In this dissertation, an econometric analysis of the customs activity indicators of the Republic of Uzbekistan (for the years 2010–2025) was conducted. Based on the methodology of econometric modeling, the following factors were selected to perform a multi-factor econometric analysis. The dependent variable is the amount of customs fees collected in million soums (Y), and the independent variables are the exemptions granted on customs fees in million soums (X_1), foreign trade turnover in million USD (X_2), the number of cargo customs declaration (CCD) in units (X_3), the number of foreign economic activity (FEA) participants in units (X_4), and the average exchange rate of foreign currencies in USD/UZS (X_5).

The Ordinary Least Squares (OLS) method was used to construct econometric models based on the factors influencing the customs fees (Y) collected in the Republic of Uzbekistan. To conduct econometric research using this method, descriptive statistics were performed for the selected factors.

In the initial stage, we perform descriptive statistics on the variables involved in the multi-factor econometric model. Table 1 below presents the calculated descriptive statistics results for the variables included in the multi-factor econometric model.

Table 1

Descriptive statistics results by factors[1]

	Y	*X1*	X_2	X_3	X_4	X_5
Mean	703354.0	8213.175	29049.99	618979.5	24004.50	6239.750
Median	417182.4	2976.238	24102.56	536364.5	20361.00	4173.000
Maximum	2193273.	27052.86	55411.51	1153536.	41834.00	12940.00
Minimum	84317.73	433.7915	17242.66	279522.0	10557.00	1511.000
Std. Dev.	668324.7	9415.357	12007.83	298633.8	12467.58	4550.826
Skewness	1.037377	0.918770	0.970067	0.412417	0.282994	0.313550
Kurtosis	2.776646	2.493919	2.656219	1.715865	1.391927	1.344230
Jarque-Bera	2.902992	2.421780	2.588206	1.552901	1.937494	2.089884
Probability	0.234220	0.297932	0.274144	0.460036	0.379558	0.351712
Sum	11253663	131410.8	464799.8	9903672.	384072.0	99836.00
Sum Sq. Dev.	6.70E+12	1.33E+09	2.16E+09	1.34E+12	2.33E+09	3.11E+08
Observations	16	16	16	16	16	16

The table data allows for the observation of the mean, median, maximum, and minimum values of each variable in the sample under study. For instance, the mean value of the dependent variable (collected customs fees, Y) is 703,354.0, the median is 417,182.4, the maximum value is 2,193,272.0, and the minimum value is 84,317.73.

Before deciding whether to include these factors in the multi-factor econometric model, it is necessary to calculate the correlations between them. Correlation coefficients are calculated to identify the relationships between the factors.

The values of the correlations between the factors are presented below. The values of the correlation coefficient matrix between the factors resulting from the correlation analysis are provided in Table 2.

Table 2

Calculated correlation matrix between factors[2]

Covariance Analysis: Ordinary
Date: 04/27/26 Time: 10:36

[1] Author's development
[2] Author's development

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 58, May, 2026
ISSN: 2749-3628,

Sample: 2010 2025
Included observations: 16
Correlation
t-Statistic

Probability	*Y*	*X1*	X_2	X_3	X_4	X_5
Y	1.000000					
X1	0.760193	1.000000				
	4.378008	-----				
	0.0006	-----				
X_2	0.916836	0.680636	1.000000			
	9.26109	4.02445	-----			
	0.0000	0.0074	-----			
X_3	0.906379	0.657976	0.552951	1.000000		
	9.24949	4.00946	2.83793	-----		
	0.0000	0.0081	0.0117	-----		
X_4	0.872300	0.615703	0.608468	0.581099	1.000000	
	8.029242	3.315075	3.253003	3.029365	-----	
	0.0000	0.0039	0.0044	0.0072	-----	
X_5	0.724616	0.582748	0.551033	0.664745	0.524327	1.000000
	6.463937	3.04402	2.98417	6.55199	2.612431	-----
	0.0021	0.0069	0.0084	0.0095	0.0176	-----

As seen from the data in Table 2 above, the correlation matrix—representing the density indicators of the relationships between the factors to be included in the multi-factor econometric model—is presented here. This correlation matrix contains the calculated values for two types of correlation coefficients.

1) Partial correlation coefficients, which reflect the relationships between the dependent variable (Y) and the independent variables (X_i).

2) Paired correlation coefficients, which reflect the relationships between the independent variables (X_i, X_j).

The correlation density between the collected customs fees (Y) and the customs fee priviliges granted (X_1) is 0.7602. This indicates a strong, positive correlation between these two factors. The correlation density between the collected customs fees (Y) and foreign trade turnover (X_2) is 0.9168, showing a dense, positive relationship between these factors. The correlation density between the collected customs fees (Y) and the number of cargo customs declaration (X_3) is 0.9064, which also demonstrates a dense, positive correlation. The correlation density between the collected customs fees (Y) and the number of foreign economic activity (FEA) participants (X_4) is 0.8723, indicating a dense, positive relationship between these factors. Additionally, the correlation density between the collected customs fees (Y) and the average exchange rate of foreign currencies is 0.7246, showing a strong, positive correlation between these variables.

Table 2 also presents the paired correlation coefficients between the independent variables based on the calculated data. Multicollinearity between factors is identified through these coefficients. If the calculated value of the paired correlation coefficient between independent variables (X_i, X_j) is greater than 0.7, it is said that multicollinearity exists between the factors. As can be seen from Table 2, where the matrix of partial and paired correlation coefficients was calculated, the values of the paired correlation coefficients between the factors influencing collected customs fees (Y) are not greater than 0.7. This, in turn, satisfies the condition for including all selected factors in the multi-factor econometric model.

Table 2 also includes coefficients calculated to determine the reliability and probability of the correlation coefficients (the values in the rows located beneath the calculated correlation coefficients). Below each correlation coefficient, its calculated Student's t-statistic and probability (prob.) are provided. The condition is set that the calculated probability between factors should not exceed 0.05. For example, the partial correlation coefficient between collected customs fees (Y) and foreign trade turnover (X_2) has values of $r_{Y,X2} = 0{,}9168$ $t = 9{,}2611$ and $\text{prob.} = 0{,}0000$. This indicates a dense relationship between these two

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 58, May, 2026
ISSN: 2749-3628,

factors, confirms that the partial correlation coefficient is reliable, and demonstrates with 95% accuracy that a positive, dense correlation exists between the two factors.

The calculated multi-factor econometric model (2) indicates that if the exemptions granted on customs fees (X_1) increase by an average of one million soums, the collected customs fees (Y) increase by an average of 1.609 million soums. If the foreign trade turnover (X_2) in the Republic increases by an average of one million USD, the collected customs fees (Y) increase by an average of 36.564 million soums. An average increase of one unit in the number of cargo customs declaration (X_3) leads to an average increase of 2.361 million soums in collected customs fees (Y). An average increase of one unit in the number of foreign economic activity (FEA) participants (X_4) results in an average increase of 42.137 million soums in collected customs fees (Y). Finally, an average increase of one soum in the average exchange rate of foreign currencies (X_5) leads to an average increase of 6.157 million soums in the collected customs fees (Y).

The coefficient of determination is used to verify the quality of the multi-factor econometric model (2) constructed for collected customs fees (Y). The coefficient of determination indicates what percentage of the dependent variable (Y) is explained by the factors (X_i) included in the model. The calculated coefficient of determination (R^2 - R-squared, as seen in Table 5) is equal to 0.9879. This means that 98.79% of the variation in collected customs fees (Y) is accounted for by the factors included in the multi-factor econometric model (2). The remaining 1.21% (100.0 - 98.79) represents the influence of factors not accounted for in the model. This, in turn, demonstrates the high quality and explanatory power of the constructed multi-factor econometric model (2).

We will check the reliability of the parameters in the calculated multi-factor econometric model (2) using Student's t-test. The tabular value of the t-test is determined based on the selected significance level (α) and the degrees of freedom ($\text{d.f.} = n - m - 1$). In this context, n represents the number of observations and m represents the number of factors. When the significance level is $\alpha = 0{,}05$ and the degrees of freedom are $\text{d.f.} = 16 - 5 - 1 = 10$, the tabular value of the t-test is equal to $t_{\text{жадвал}} = 2{,}2281$.

It can be observed from the data (Table 5) that the calculated t-test values $\alpha = 0{,}05$ and $\alpha = 0{,}1$ for all factors included in the multi-factor econometric model are greater than the tabular values at the specified levels of significance and accuracy. This confirms that all variables are statistically significant and reliable, justifying their inclusion in the multi-factor econometric model.

We will use the Durbin-Watson (DW) criterion to check for the presence of autocorrelation in the residuals of the dependent variable (Y) for the multi-factor econometric model (2) constructed for collected customs fees.

The calculated DW value is compared with the tabular values DW_L and DW_U. If $DW_{calc} < DW_L$, autocorrelation is said to exist in the residuals. If $DW_{calc} > DW_U$, it indicates that there is no autocorrelation in the residuals. In this case, the lower bound of the Durbin-Watson criterion is $DW_L = 0.62$ and the upper bound is $DW_U = 2.15$. Since the calculated value is $DW_{calc} = 2.2257$, the condition $DW_{calc} > DW_U$ is met. Therefore, there is no autocorrelation in the residuals of the dependent variable (collected customs fees (Y)).

To forecast the dependent indicator for future periods using the calculated multi-factor econometric model (2), the MAPE (Mean Absolute Percentage Error) coefficient is calculated. If the calculated MAPE value is less than 15.0%, the model can be used for forecasting the dependent variable; otherwise, it is considered unsuitable. For the collected customs fees (Y) under study, the value of the MAPE coefficient is 2.1498% (Figure 1).

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 58, May, 2026
ISSN: 2749-3628,

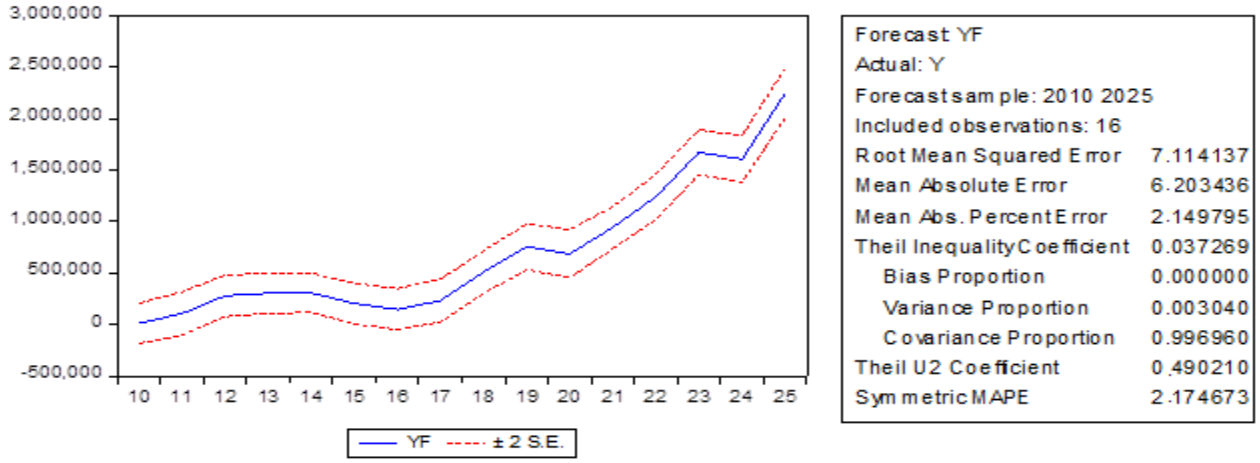

Figure 1. Indicators for using the calculated model in forecasting[3]

This value is significantly lower than 15.0% (MAPE = 2.1498%). Since it stands at only 2.1498%, we can conclude that the multi-factor econometric model (2) is highly reliable and can be effectively used for forecasting the collected customs fees (Y).

The absence of autocorrelation in the residuals of the dependent variable also demonstrates that the multi-factor econometric model (2) presented above can be effectively utilized for forecasting.

The fact that the standard errors of the factors in the multi-factor econometric model (2) have small values also indicates the high statistical significance of the calculated model.

As a result of the calculated multi-factor econometric model, we obtain the forecasted values of collected customs fees for the upcoming period (Figure 2).

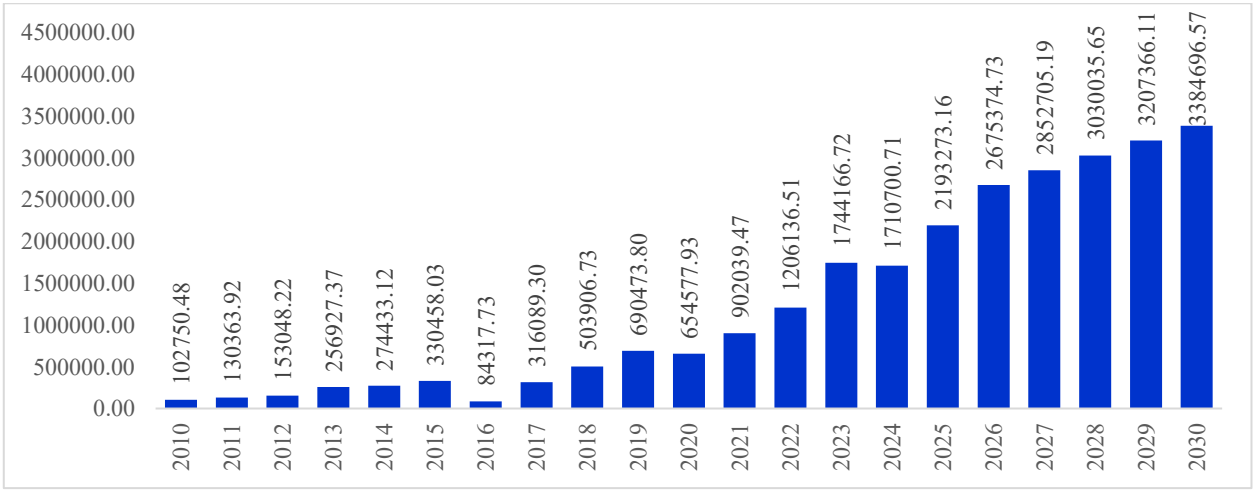

Figure 2. Dynamics of collected customs fees for 2010–2025 and forecast values for 2026–2030, in milli on soums[4]

The forecast results show that the amount of collected customs fees is expected to increase 1.5 times or by 1.2 trillion soums by 2030 compared to 2025.

Based on the research conducted above, it has been determined that a number of factors exert their influence on customs fees.

CONCLUSION AND RECOMMENDATIONS

[3] Author's development
[4] Author's development

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 58, May, 2026
ISSN: 2749-3628,

As a result of the econometric analysis carried out, the developed multi-factor econometric model shows the following:

- if the benefits provided for customs fees (X_1) increase by an average of one million soums, the collected customs fees (Y) are expected to increase by an average of 1.609 million soums;
- if the foreign trade turnover (X_2) increases by an average of one million US dollars, the collected customs fees (Y) are expected to increase by an average of 36.564 million soums;
- an average increase of one unit in the number of customs cargo declarations (CCD) (X_3) leads to an average increase in collected customs fees (Y) of 2.361 million soums;
- an average increase of one unit in the number of participants in foreign economic activity (FEA) (X_4) resulted in the probability of an average increase in collected customs fees (Y) of 42.137 million soums.

As a final conclusion, it can be stated that the rational and efficient management of factors influencing customs fees plays a crucial role in strengthening the country's economic security and ensuring the state's financial stability.

REFERENCE:

1. Decree of the President of the Republic of Uzbekistan 16.02.2026 y. "On additional measures to consistently continue reforms and bring them to a new stage within the framework of priority directions of the country's development until 2030" № DP-21. https://www.lex.uz/uz/docs/8052981
2. Maria-Carmen Guisan, "An econometric model of industry, foreign trade, and economic development in Philippines, 1990-2006". Journal of International Trade Studies, 2008.
3. Xodiyev B.Yu., Shodiyev T.Sh., Berkinov B.B. Ekonometrika. O'quv qo'llanma. – T.: TDIU, 2017. – 144 b.
4. Berkinov B.B. Ekonometrika. O'quv qo'llanma. – T.: Fan va texnologiya, 2015. – 184 bet.
5. Muxamedov Yu. Barqaror ijtimoiy-iqtisodiy o'sishning omillari va ekonometrik modellari (O'zbekiston Respublikasi misolida). /Diss. iqt.fan. dok. TDIU. – T., 2006-y.
6. Adiljonovich, S. O. (2025). O'ZBEKISTONDA BOJXONA TO'LOVLARI TUSHUMINING SAMARADORLIGIGA TA'SIR ETUVCHI OMILLAR TAHLILI. Scientific Journal of Actuarial Finance and Accounting, 5(03), 249-256.
7. Nosirovich, T. P., Rixsibayevich, A. S., & Adiljonovich, S. O. (2021). Prospects for increasing the effectiveness of the application of privileges and preferences from customs duties. ACADEMICIA: An International Multidisciplinary Research Journal, 11(7), 69-76.
8. САРМАНОВ, О. А., & ФАРХОДОВ, Ф. Ф. БОЖХОНА ЙИҒИМЛАРИНИ ҲИСОБЛАШ ВА УНДИРИШНИ ТАКОМИЛЛАШТИРИШ Тулкин Насирович ПАРДАЕВ.
9. O.A.Sarmanov. Customs payments received to the state budget and econometric analysis of factors affecting it. Asian Journal of Technology & Management Research (AJTMR) ISSN: 2249 –0892 Vol14 Issue–01, June — 2024, (p. 163-168).