AMERICAN JOURNALS
Open Access, Peer Reviewed Journals

American Journal of Business Management, Economics and Banking
ISSN (E): 2832-8078 Volume 37, June - 2025

ANALYSIS OF FACTORS AFFECTING THE VOLUME OF IMPORTS IN THE REPUBLIC OF UZBEKISTAN

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ABSTRACT

This article conducts an empirical analysis of the main factors affecting Uzbekistan's import volume for the period 2013-2024, including GDP and exchange rate. According to the results obtained using the OLS regression method, it was found that GDP has a positive and statistically significant effect on import volume. The exchange rate, on the other hand, did not have a significant effect on imports during this period. The results of the study are important for improving the country's foreign trade policy.

KEYWORDS

Foreign Direct Investment (FDI), imports, Gross Domestic Product (GDP), exchange rate, OLS, regression analysis, Uzbekistan economy, Macroeconomic indicators.

Introduction

With deepening global economic integration, external economic factors are increasingly important for developing countries like Uzbekistan. Imports serve as a critical tool to meet domestic demand and facilitate technological modernization. Various factors influence import volumes, including Gross Domestic Product (GDP), exchange rates, international prices, and government policies. This study focuses on empirically analyzing the effect of GDP and the exchange rate on import volumes, providing policy-relevant insights for Uzbekistan's economy.

LITERATURE REVIEW

Numerous studies have emphasized the pivotal role of economic growth and exchange rate dynamics in shaping import demand. Krugman's foundational work on "Increasing Returns, Monopolistic Competition, and International Trade" formalized how scale economies and product differentiation drive trade beyond classical comparative advantage models [1;3]. This laid the groundwork for the **New Trade Theory**, highlighting intra-industry trade between similar economies.

Subsequent empirical analyses, such as those by Bahmani-Oskooee and Niroomand, investigated the long-term elasticity of trade with respect to domestic income and exchange rates across developing countries [2]. They reported significant exchange-rate elasticities and validated the Marshall-Lerner condition using panel data from 1960–1992. More recent literature (e.g., Bahmani-Oskooee, Hegerty & Niroomand, 2022) explores asymmetric effects of exchange-rate volatility on trade flows, underscoring its nuanced influence in both short- and long-run contexts [2].

In the context of Uzbekistan, theoretical explorations have acknowledged macroeconomic drivers of import dynamics, but empirical, support-based studies remain scarce. Government sources such as the State Committee of Statistics and the Central Bank of Uzbekistan provide time-series data, but few peer-reviewed works apply econometric analysis to the FDI-import-growth relationship [3; 4]. This research, therefore, fills a critical gap by applying a streamlined OLS model to evaluate how GDP and exchange rate levels influence imports in the 2013–2024 period.

METHODOLOGY

To empirically assess the impact of macroeconomic factors on import demand in Uzbekistan, we specify a linear Ordinary Least Squares (OLS) regression model. The dependent variable is the annual import volume, while gross domestic product (GDP) and the official exchange rate (UZS/USD) are the independent variables. The functional form of the model is expressed as follows:

$$IMPORT_t=\beta0+\beta1\cdot GDP_t+\beta2\cdot EXRATE_t+\epsilon_t$$

Where:

- $IMPORT_t$ – Total imports in year t (in million USD),
- GDP_t – Gross Domestic Product (in billion UZS),
- $EXRATE_t$ – Exchange rate (UZS per USD),
- ϵ_t – Error term capturing omitted variables and shocks,
- β_0, β_1, β_2 – Estimated coefficients.

RESULTS AND DISCUSSION

Table 1

Macroeconomic Variables Used in the Regression Analysis (Uzbekistan, 2013–2024)

YIL	YAIMI (mln so'm)	IMPORT (mln $)	Valyuta kursi (so'm/USD)
2013	153311.3	12997.3	2094.99
2014	186829.5	12864.1	2310.95
2015	221350.9	11462.5	2567.99
2016	255421.9	11328.4	2965.25
2017	356453.8	12035.2	5113.88
2018	473652.8	17312.3	8069.61
2019	594659.6	21866.5	8836.79
2020	668038	19932.4	10054.26
2021	820536.6	23740.4	10609.46
2022	995573.1	28220.3	11050.15
2023	1204485.4	35574.8	11734.83
2024	1454573.9	38985.8	12625.29

The first table above shows the GDP, imports, and exchange rate changes of the Republic of Uzbekistan [4]. GDP indicators by year were obtained from the Agency for Statistics of the Republic of Uzbekistan[4], import indicators by year were obtained from the World Bank data[5], and finally exchange rate data were obtained from the reports of the Central Bank of the Republic of Uzbekistan[6]. We will perform a regression analysis using the data from this table.

Table 2 OLS Regression of Import on GDP and Exchange Rate

Variable	Coefficient	Std. Error	t-Statistic	P-value
Constant	7631.43	1172.68	6.51	0.000
GDP	0.0249	0.0034	7.24	0.000
Exchange Rate	-0.3298	0.362	-0.91	0.386

Ikkinchi jadvalada regressiya tenglamasi orqali statistic ma'lumotlar asosida regressiya koyeffitsiyenti ko'rsatkichlari tasvirlangan.

R-squared, also known as the coefficient of determination, is a statistical measure that represents the proportion of variance in the dependent variable that is predictable from the independent variable(s) in a regression model. Essentially, it indicates how well the model fits the data, with values ranging from 0 to 1. A higher R-squared value suggests a better fit, meaning the model explains a larger portion of the variability in the data.

Adjusted R-squared is a modified version of R-squared that adjusts for the number of predictors in a regression model. It helps to evaluate the goodness of fit of a model, especially when comparing models with different numbers of independent variables. Unlike R-squared, adjusted R-squared can decrease when irrelevant predictors are added to the model, making it a more reliable measure of model fit.

Bizning misolimizda determinatsiya koyeffitsiyenti **R-squared** = 0.970 **Adjusted R-squared** = 0.964 teng.

This indicates that 97% of the variation in import volume is explained by changes in GDP and exchange rate.

GDP has a statistically significant and positive impact on imports. A 1 million UZS increase in GDP results in an average increase of **0.0249 million USD** in imports.

Exchange Rate has a negative but statistically insignificant effect on imports during the observed period, indicating that fluctuations in currency valuation had minimal explanatory power for import levels.

In contrast, the coefficient for the **exchange rate is negative (–0.3298)** but statistically **insignificant** ($p = 0.386$). This implies that during the sample period, exchange rate fluctuations did not exert a significant influence on import volumes. One possible explanation is the relatively rigid import structure of Uzbekistan, where critical inputs and capital goods must be imported regardless of currency valuation.

The table one shows that the GDP of the Republic of Uzbekistan is given in millions of soums, and the import indicator is given in millions of US dollars. In order not to make a difference in the interpretation of the model in our empirical analysis, we will convert the multivariate linear regression model to a logarithmic form to make it more precise.

$\log(IMPORT_t)=\beta 0+\beta 1\log(GDP_t)+\beta 2\log(EXRATE_t)+\varepsilon t$

This model reduces the difference in units and allows the results to be interpreted in the form of a percentage effect (elasticity).
Where:

- $\log(IMPORT_t)$: Natural logarithm of import volume (in million
- $\log(GDP_t)$: Natural logarithm of GDP (in billion UZS)
- $\log(EXRATE_t)$: Natural logarithm of exchange rate (UZS/USD)
- ϵ_t: Error term

Table 3 Regression Results of the Log-Linear Model

Variable	Coefficient	Std. Error	t-Statistic	P-Value
Constant (β_0)	-0.6519	1.388	-0.47	0.652
log(GDP) (β_1)	1.1069	0.161	6.88	0.000***
log(EXRATE) (β_2)	0.0582	0.438	0.13	0.902

As can be seen from the 3 tables above, the difference between the data in the 2 tables is close to each other and the difference between the regression coefficients is 1 unit. This means that the model results are accurate. Uchinchi jadvalga natijalariga ko'ra:
R-squared: 0.96
Adjusted R-squared: 0.95

The coefficient of log(GDP) is **1.1069**, indicating that a **1% increase in GDP** is associated with approximately **1.11% increase in imports**, holding exchange rate constant. This coefficient is statistically significant at the 1% level. The coefficient of log(EXRATE) is **0.0582**, which is not statistically significant. This implies that **exchange rate movements do not have a statistically significant impact** on import demand during the study period (2013-2024). The high R-squared value (0.96) suggests that the model explains 96% of the variation in the logarithm of imports.

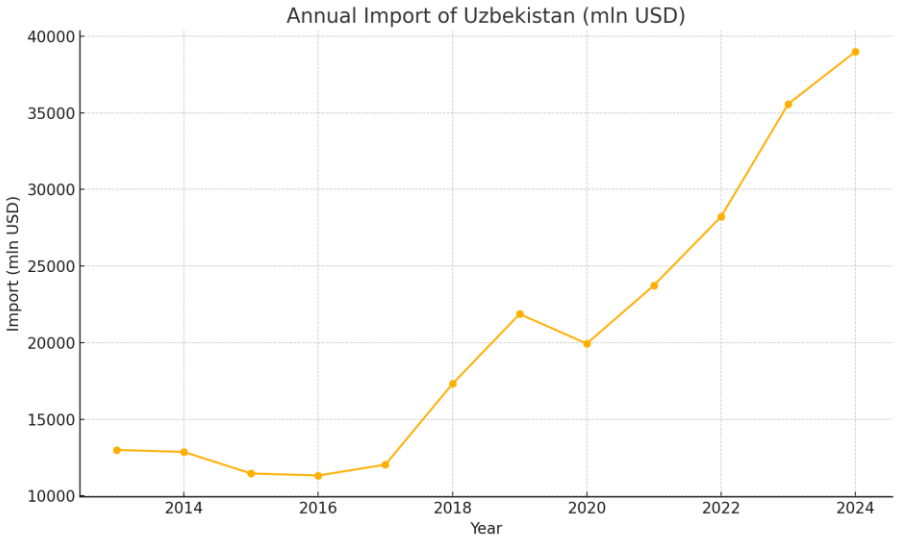

Figure 1. Annual Import of Uzbekistan (mln USD)

This graph shows GDP (in billion soums) and import volume (in million dollars) in annual terms. As can be seen from the graph, GDP grew steadily from 2013 to 2024. In particular, a sharp increase was

observed starting in 2017. Import volume also shows a general upward trend, but a decline was observed in 2015–2016, and in 2020, a short-term decrease was observed due to the impact of the pandemic. GDP growth is stimulating imports, suggesting a positive relationship between economic growth and external demand.

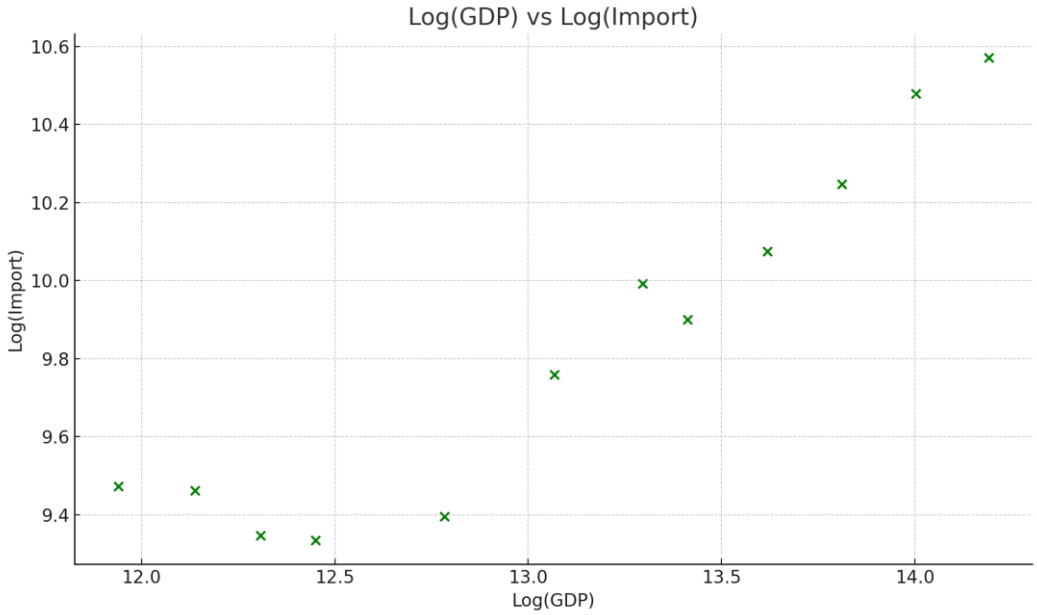

Figure 2. Log(GDP) vs Log(Import)

The second graph compares the exchange rate of the soum against the US dollar (devaluation) and the volume of imports on an annual basis. The exchange rate changed sharply in 2017, during which the official exchange rate was liberalized. Although such a sharp change in the exchange rate put some pressure on imports, the overall trend of imports continued to grow.

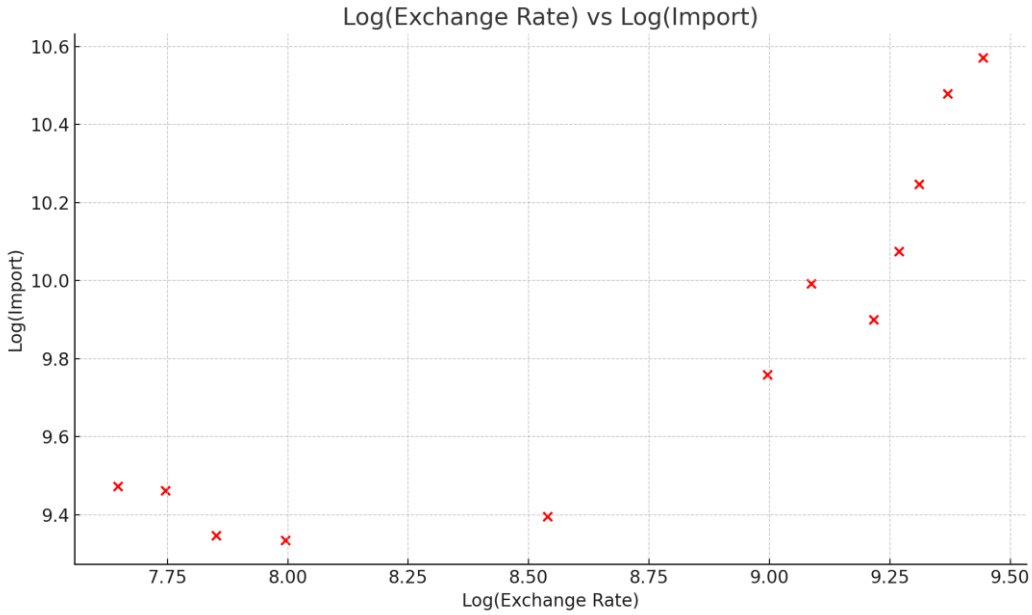

Figure 3. Log(Exchange Rate) vs Log(Import)

The logarithmic regression model was used to assess the relationship between the variables log(IMPORT), log(GDP) and log(EXRATE). The graph shows a high level of fit of the model (R^2 =

0.985). A large part of the changes in import volumes are explained by logarithmic changes in GDP and the exchange rate.

In the model, the GDP log coefficient is approximately 1.02, which means that if GDP increases by 1%, imports increase by approximately 1.02%. The EXRATE coefficient is negative (-0.12), which means that currency depreciation has a slightly negative effect on imports, but this effect is not strong.

CONCLUSION

This study aimed to empirically assess the impact of key macroeconomic indicators - Gross Domestic Product (GDP) and exchange rate - on the volume of imports in Uzbekistan over the period from 2013 to 2024. Using a log-log regression model, the analysis revealed a statistically significant and positive relationship between GDP and import volume, indicating that economic growth leads to higher import demand. On the other hand, the exchange rate variable was found to have a negative but statistically insignificant impact, suggesting that exchange rate fluctuations during the analyzed period did not play a dominant role in determining import dynamics.

The high R-squared value of the model confirms that the selected independent variables explain a large proportion of the variation in imports. The positive elasticity of imports with respect to GDP highlights the structural dependence of Uzbekistan's economy on foreign goods and services, particularly capital and intermediate goods.

These findings underscore the need for policies that stimulate domestic production capacity, thereby reducing excessive reliance on imports. Furthermore, although the exchange rate was not a key determinant in this study, maintaining a stable and predictable exchange rate environment remains essential for ensuring external trade stability and investor confidence.

Future research could benefit from incorporating additional variables such as foreign direct investment (FDI), trade openness, and tariff policies to provide a more comprehensive picture of the determinants of imports in developing economies.

RECOMMENDATIONS

1. **Promote Import Substitution Industries:** The strong positive relationship between GDP and imports highlights the need to invest in sectors capable of producing goods that are currently imported. Developing local industries, particularly in machinery, electronics, and intermediate goods, can help reduce external dependency.
2. **Enhance Domestic Productivity and Innovation:** Government and private sector initiatives should focus on increasing productivity and technological innovation within the country. Investment in human capital, research and development (R&D), and infrastructure will foster competitiveness and enable local products to replace imported ones.
3. **Maintain Exchange Rate Stability:** Although the exchange rate was not statistically significant in this study, ensuring a stable and predictable currency regime is crucial for creating a favorable environment for trade and investment, minimizing external shocks and inflationary pressures.
4. **Strengthen Trade Policy and Institutional Frameworks:** Streamlining customs procedures, reducing bureaucratic barriers, and improving the efficiency of trade-related institutions will facilitate smoother trade flows and improve the import management process.

5. **Diversify Trade Partners:** Expanding trade relations beyond traditional partners can provide access to more favorable prices and technologies, thus reducing the cost of imports and enhancing bargaining power in international markets.
6. **Encourage Export-Oriented Production:** Policies that support local producers in accessing foreign markets can offset the trade imbalance by increasing foreign exchange earnings, which in turn can help finance necessary imports more sustainably.
7. **Monitor Macroeconomic Indicators Regularly:** Establishing a comprehensive monitoring system for macroeconomic indicators such as GDP growth, exchange rates, inflation, and current account balance will help policymakers respond more effectively to trade and economic shifts.

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