



RESEARCH ARTICLE

VAT, Exchange Rate, and Non-Oil Imports: The Moderating Role of GDP

Putri Amelia Vega ^{1*} | Munawaroh ² | M. Djadjuli ³

^{1*,2,3} Accounting Study Program, Faculty of Economics and Business, Universitas Muhammadiyah Cirebon, Cirebon City, West Java Province, Indonesia.

Correspondence

¹ Accounting Study Program, Faculty of Economics and Business, Universitas Muhammadiyah Cirebon, Cirebon City, West Java Province, Indonesia.
Email. vegaputri497@gmail.com.

Funding information

Universitas Muhammadiyah Cirebon.

Abstract

Indonesia's non-oil and gas imports are influenced by fiscal and macroeconomic conditions, including Value Added Tax (VAT) policy and exchange rate movements. However, prior studies have reported inconsistent findings regarding their effects on import activity. This study examines the effects of the VAT rate and the Rupiah exchange rate on Indonesia's non-oil and gas import value, as well as the moderating role of Gross Domestic Product (GDP). GDP is included as a moderating variable because changes in domestic economic activity may alter import demand and may strengthen or weaken the effects of VAT and exchange rate movements. This study employs a quantitative explanatory approach using quarterly secondary data from the first quarter of 2016 to the fourth quarter of 2025, consisting of 40 observations. Data were obtained from Statistics Indonesia (BPS), Bank Indonesia, and the Ministry of Finance. The analysis uses Moderated Regression Analysis (MRA) with an AR(1) specification to address serial correlation. The results show that the VAT rate and the Rupiah exchange rate do not significantly affect Indonesia's non-oil and gas import value. GDP also does not significantly moderate the effects of either variable on non-oil and gas imports. These findings differ from several prior studies that report significant effects of tax policy and exchange rates on imports. This study provides empirical evidence regarding the role of GDP as a moderating variable in Indonesia's non-oil and gas import dynamics.

Keywords

Value Added Tax; Exchange Rate; Gross Domestic Product; Non-Oil and Gas Imports; Moderated Regression Analysis.

1 | INTRODUCTION

International trade has emerged as a key element in fostering economic growth, especially for developing countries such as Indonesia. Import activities provide access to essential raw materials, capital goods, and intermediate products required by domestic industries. Among various import categories, non-oil and gas imports play a vital role because they are closely associated with manufacturing, infrastructure projects, and domestic consumption. The performance of Indonesia's non-oil and gas imports is shaped by a range of economic factors, including tax regulations and exchange rate fluctuations. One significant fiscal policy affecting import activity is Value Added Tax (VAT). VAT is an indirect tax applied to the purchase of goods and services, including imported products. Changes in VAT rates can influence the final price of imported goods and affect purchasing decisions made by both businesses and consumers.

In Indonesia, VAT regulations have undergone several changes. VAT was initially set at 10%, increased to 11% in April 2022 under the Harmonization of Tax Regulations Law, and is scheduled to rise to 12% in 2025 (Menkeu, 2024). These changes reflect government efforts to increase state revenue while maintaining economic stability. In addition to tax policy, exchange rate fluctuations are an important factor influencing import performance. When the Rupiah depreciates against foreign currencies, particularly the US dollar, the domestic cost of imported goods tends to increase because international transactions are generally conducted in foreign currencies. Conversely, Rupiah appreciation may reduce import costs and encourage import activity. The importance of exchange rates in import demand is also supported by recent international literature, which shows that import demand responds differently to price and income conditions across countries and product categories (Grübler *et al.*, 2022).

Previous studies have shown that macroeconomic factors affect import activity in Indonesia. According to Kuswanto and Rosianawati (2016), both GDP and the exchange rate affect the country's non-oil and gas imports. In addition, Subiyanto *et al.* (2022) noted that fluctuations in exchange rates and tax regulations affect import activity by altering transaction costs. However, previous studies have generally focused on direct relationships and have rarely considered economic growth as a moderating factor. In this study, Gross Domestic Product (GDP) is included as a moderating variable because economic growth reflects the overall capacity of an economy to engage in international trade. An increase in GDP indicates higher economic activity, which may strengthen the relationship between tax policy, exchange rate fluctuations, and import demand. Based on this background, the purpose of this study is to examine how VAT rates and the Rupiah exchange rate influence the value of Indonesia's non-oil and gas imports, as well as to determine whether GDP plays a moderating role in these relationships.

These findings indicate that the relationship between macroeconomic variables and imports may depend on economic conditions and the analytical approach used. Meanwhile, international evidence suggests that import demand is closely associated with income conditions, although the magnitude of the relationship varies across countries and types of imported goods (El-Shagi *et al.*, 2022). Based on these findings, Gross Domestic Product (GDP) is included in this study as a moderating variable rather than solely as a direct determinant of imports. GDP reflects the scale of domestic economic activity and purchasing power, which may influence demand for imported raw materials, intermediate goods, and capital goods. Therefore, changes in GDP may strengthen or weaken the relationship between VAT policy, exchange rate movements, and non-oil and gas imports. This approach addresses a research gap because previous studies have predominantly examined the direct effects of GDP, exchange rates, or tax-related factors on imports, while limited attention has been given to the role of GDP as a moderator in the relationship between VAT, exchange rates, and non-oil and gas imports in Indonesia. The present study therefore examines the effects of the VAT rate and the Rupiah exchange rate on Indonesia's non-oil and gas import value and investigates whether GDP moderates these relationships.

This study contributes to the literature by providing empirical evidence on the moderating role of GDP in Indonesia's non-oil and gas import dynamics using quarterly data covering 2016Q1–2025Q4. The observation period includes important changes in VAT policy and major macroeconomic developments, thereby providing a relevant context for examining the interaction between fiscal policy, exchange rate movements, and domestic economic conditions. The findings are expected to provide additional empirical evidence for understanding Indonesia's import dynamics and offer considerations for policymakers in evaluating fiscal and macroeconomic policies related to non-oil and gas imports.

2 | BACKGROUND THEORY

2.1 International Trade Theory

International trade theory explains that nations engage in trade due to differences in resource endowments, production capabilities, and economic advantages that promote commerce among countries. Imports occur when domestic demand exceeds local production capacity. According to the principle of comparative advantage, global trade enables countries to obtain goods more efficiently by specializing in certain products. In Indonesia, the importation of non-oil and gas products is crucial because various industrial sectors rely on foreign raw materials,

equipment, and semi-finished goods. Therefore, fluctuations in economic conditions may affect import demand (Aulia *et al.*, 2025).

2.2 Import Demand Theory

Import demand theory explains that the demand for imported goods is primarily determined by domestic income and the relative price of imported goods. An increase in domestic income can raise purchasing power and production activity, thereby increasing demand for imported goods. Conversely, an increase in the relative price of imported goods tends to reduce import demand. The exchange rate is an important component of import prices because it determines the amount of domestic currency required to purchase foreign goods. Empirical studies support the importance of income and exchange rates in explaining import demand. Chakraborty and Maitra (2022) found that domestic income has a positive effect on import demand, while exchange rate depreciation reduces import demand. Similarly, El-Shagi *et al.* (2022), based on a meta-analysis of previous studies, show that income is an important determinant of import demand and that income elasticity varies across countries and economic conditions. In the context of this study, GDP represents domestic economic activity and purchasing capacity, while the Rupiah exchange rate represents an important factor determining the domestic cost of imported goods. Thus, changes in GDP and exchange rates are theoretically expected to influence Indonesia's non-oil and gas import value.

2.3 Elasticity Theory

Elasticity theory explains the extent to which quantity demanded responds to changes in its determining factors, such as price and income. In import demand, price elasticity indicates the responsiveness of imports to changes in the price of imported goods, while income elasticity indicates the responsiveness of imports to changes in domestic income. Therefore, changes in VAT and exchange rates do not necessarily produce the same magnitude of change in import demand. An increase in VAT may raise the final price of imported goods. If import demand is elastic, the increase in price may result in a relatively large decline in import demand. However, if imported goods are essential inputs for domestic production and have limited substitutes, import demand may be relatively inelastic. Grübler *et al.* (2022) demonstrate that import demand elasticities differ considerably across products and countries, with intermediate goods tending to exhibit greater price responsiveness than goods intended for final consumption. Exchange rate movements can also generate different responses in import demand. Rupiah depreciation increases the domestic-currency cost of imported goods and may reduce import demand, whereas appreciation may lower import costs. However, the magnitude of the response depends on the elasticity of import demand. Consequently, VAT and exchange rate changes may have either significant or insignificant effects on import value depending on the characteristics of imported goods and prevailing economic conditions.

2.4 VAT, Exchange Rate, and Non-Oil and Gas Import Value

Value Added Tax is a type of consumption tax levied on goods and services. In the context of imports, VAT contributes to the cost structure because imported goods are subject to taxation upon entry into the domestic market. As noted by Kharisma and Furqon (2021), changes in VAT regulations can affect economic behavior, as tax rate adjustments may influence both purchasing power and production costs. An increase in VAT rates may reduce demand for imports because of higher costs, although the extent of this effect may vary depending on the nature of the imported goods. Exchange rates indicate the value of domestic currency relative to foreign currencies. International trade theory suggests that when a currency depreciates, the cost of imports rises because importers require more domestic currency to purchase goods from abroad. Muryani and Hutajulu (2023) found that exchange rate fluctuations affect Indonesia's import performance, as exchange rate changes have a direct impact on the cost of international transactions. Gross Domestic Product (GDP) reflects a country's economic strength and its capacity to purchase goods and services. Economic growth can increase the need for imports, as expanding industries require more resources from international suppliers. According to Bangun and Afifuddin (2024), GDP plays a crucial role in import transactions, as economic expansion tends to increase demand for foreign goods. In this study, GDP is viewed as a moderating variable because improved economic conditions may influence the extent to which changes in VAT and exchange rates affect import activity.

Hypotheses

H1: The Value Added Tax rate affects Indonesia's non-oil and gas import value.

H2: The Rupiah exchange rate affects Indonesia's non-oil and gas import value.

H3: Gross Domestic Product (GDP) moderates the effect of the VAT rate on non-oil and gas import value.

H4: Gross Domestic Product (GDP) moderates the effect of the Rupiah exchange rate on non-oil and gas import value.

3 | METHOD

3.1 Data and Variables

Descriptive statistics were used to provide an overview of the characteristics of the variables observed during the study period. The study uses quarterly data covering the period from the first quarter of 2016 to the fourth quarter of 2025, resulting in 40 observations for each variable. The descriptive statistics show that the mean value of non-oil and gas import value (LN_Y) is 10.60664, with a minimum value of 10.24164 and a maximum value of 10.94222. The Rupiah exchange rate (LN_X2) has a mean value of 9.589200, ranging from 9.483030 to 9.721392. Meanwhile, GDP (LN_Z) has a mean value of 14.84839, with a minimum of 14.63296 and a maximum of 15.06095. The VAT rate (X1) has a mean value of 0.103750, with a minimum of 0.100000 and a maximum of 0.110000. The relatively small standard deviation of 0.004903 reflects the limited variation in the VAT rate during the observation period. Overall, the descriptive statistics indicate that the variables exhibit different levels of variation throughout the quarterly observation period.

Table 1. Measurement of Variables

Variable	Unit	Source
Non-oil and Gas Import Value (Y)	Total value of Indonesia's non-oil and gas imports (million USD)	Statistics Indonesia (BPS)
VAT Rate (X1)	Applicable VAT percentage (%)	Ministry of Finance
Exchange Rate (X2)	Rupiah exchange rate against USD	Bank Indonesia
Gross Domestic Product (Z)	Gross Domestic Product at constant prices (billion rupiah)	Statistics Indonesia (BPS)

To minimize discrepancies in measurement scales and improve the accuracy of model estimation, several variables are transformed using the natural logarithm (LN), particularly those expressed in monetary terms. This transformation helps reduce data dispersion, stabilize variance, and produce more reliable coefficient estimates in the regression analysis.

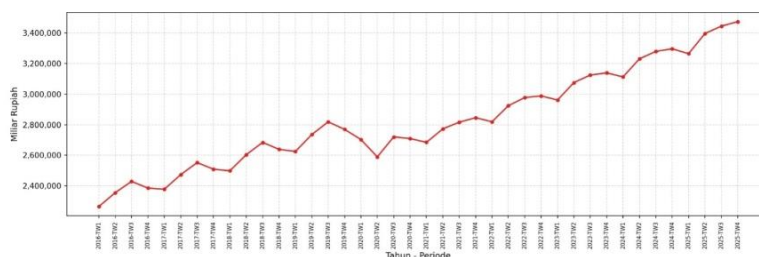


Figure 1. Graphic GDP

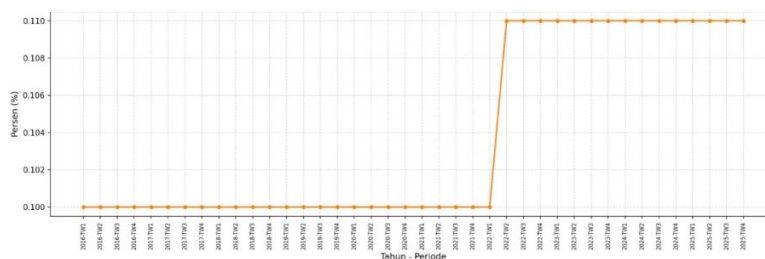


Figure 2. Graphic VAT

3.2 Stationarity Test

Because this study uses quarterly time-series data, a stationarity test was conducted to determine whether the variables contain a unit root. The Augmented Dickey-Fuller (ADF) test was employed to examine the stationarity of the variables. The null hypothesis (H_0) states that the variable contains a unit root, indicating that the series is non-stationary, while the alternative hypothesis (H_1) states that the variable is stationary. The decision criterion is based on a 5% significance level. A probability value below 0.05 indicates that the null hypothesis is rejected and the variable is considered stationary. If the variable is not stationary at the level form, the ADF test is continued at the first difference or subsequent differences until stationarity is achieved. The stationarity test was conducted for the dependent variable, independent variables, moderating variable, and interaction variables used in the regression model.

3.3 Regression Model

The moderation model applied in this study follows the Moderated Regression Analysis (MRA) approach, which is used to examine both direct and interaction effects among the variables. Based on this approach, the regression equation is formulated to test whether GDP moderates the relationship between the independent variables and non-oil and gas import values.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 Z + \beta_4 (X_1 Z) + \beta_5 (X_2 Z) + \varepsilon$$

Where:

Y = non-oil and gas import value

α = constant

β = regression coefficient

X1 = VAT rate

X2 = Rupiah exchange rate

Z = Gross Domestic Product (GDP)

X1Z = interaction between VAT rate and GDP

X2Z = interaction between exchange rate and GDP

ε = error term

4 | RESULTS AND DISCUSSION

4.1 Results

4.1.1 Descriptive Statistics

Descriptive statistics were used to provide an overview of the characteristics of the variables observed during the study period. The study uses quarterly data covering the period from the first quarter of 2016 to the fourth quarter of 2025, resulting in 40 observations for each variable. The descriptive statistics show that the mean value of non-oil and gas import value (LN_Y) is 10.60664, with a minimum value of 10.24164 and a maximum value of 10.94222. The Rupiah exchange rate (LN_X2) has a mean value of 9.589200, ranging from 9.483030 to 9.721392. Meanwhile, GDP (LN_Z) has a mean value of 14.84839, with a minimum of 14.63296 and a maximum of 15.06095. The VAT rate (X1) has a mean value of 0.103750, with a minimum of 0.100000 and a maximum of 0.110000. The relatively small standard deviation of 0.004903 reflects the limited variation in the VAT rate during the observation period. Overall, the descriptive statistics indicate that the variables exhibit different levels of variation throughout the quarterly observation period.

4.1.2 Classical Assumption Test

Before regression analysis was conducted, classical assumption tests were carried out to verify that the regression model satisfied the necessary statistical requirements. These tests were important to ensure the reliability, validity, and accuracy of the estimation results. By confirming that the model met the basic assumptions, the analysis could proceed with greater confidence in the consistency of the findings.

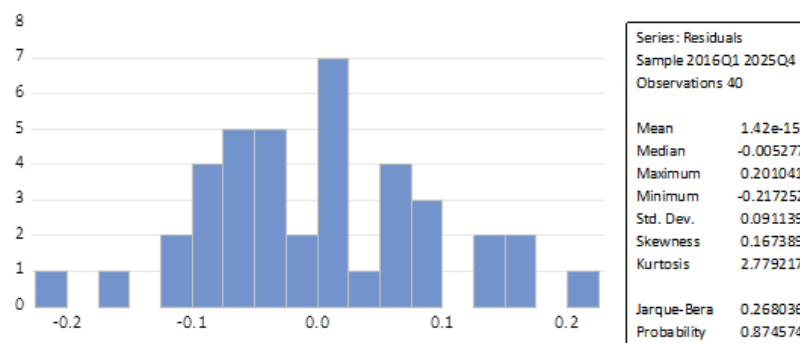


Figure 3. Normality Test Results

A normality test was performed to assess whether the residuals from the regression model followed a normal distribution. The Jarque-Bera method was used for the normality test. The decision criterion was based on the probability value from the Jarque-Bera test; if the value was greater than the 5% (0.05) significance level, the residuals were considered normally distributed. The test result showed a Jarque-Bera statistic of 0.268036 with a probability value of 0.874574. Since the probability value exceeds 0.05, the residuals in the regression model are normally distributed, indicating that the normality assumption is met.

Table 2. Multicollinearity Test Result

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	11.74190	52194.59	NA
X1	34.24673	1642.204	3.567940
LN_X2	0.399182	163171.3	8.020153
LN_Z	0.166632	163316.0	9.327909

According to the results of the test, the centered VIF values were 3.567940 for X1 (VAT rate), 8.020153 for LN_X2 (exchange rate), and 9.327909 for LN_Z (GDP). Each of these values is below the threshold of 10. Therefore, it can be concluded that there is no significant correlation among the independent variables in the regression model, indicating that multicollinearity does not exist.

Table 4. Heteroskedasticity Test Result

est Statistic	Value	Prob.
F-statistic	2.431880	0.0809
Obs*R-squared	6.740300	0.0807
Scaled explained SS	4.856944	0.1826

According to the findings of the heteroskedasticity test, an Obs*R-squared value of 6.740300 was recorded, along with a Chi-Square probability of 0.0807. Since this value exceeds 0.05 ($0.0807 > 0.05$), it can be inferred that the regression model utilized in the study is free from heteroskedasticity problems.

Table 5. Autocorrelation Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.81840	6.456314	-1.830519	0.0759
X1	-0.194025	13.72948	-0.014132	0.9888
LN_X2	-0.148960	0.472869	-0.315013	0.7547
LN_Z	1.607770	0.398012	4.039502	0.0003
AR(1)	0.682563	0.109967	6.206966	0.0000
SIGMASQ	0.004500	0.001421	3.166628	0.0032

As a result, the model underwent improvement through the application of a first-order autoregressive AR (1) technique. The results of the AR (1) estimation reveal an AR (1) coefficient of 0.682563, accompanied by a probability value of 0.0000, suggesting that the autoregressive component is significant in the model. After the AR (1) adjustment, the Durbin-Watson statistic of 1.734257 indicates that the autocorrelation problem in the model has been effectively addressed.

4.1.3 Moderated Regression Analysis Test

Moderated Regression Analysis was used to examine whether GDP moderates the relationship between the VAT rate, exchange rate, and non-oil and gas import value. This test helps determine whether the interaction terms between the independent variables and GDP significantly influence the dependent variable during the observation period.

Table 6. Moderated Regression Analysis Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-501.4633	556.8144	-0.900593	0.3745
X1	-1336.090	2583.699	-0.517123	0.6086
LN_X2	65.26010	63.04599	1.035119	0.3084
LN_Z	34.62802	37.49761	0.923473	0.3627
X1_Z	89.78325	172.3757	0.520858	0.6061
X2_Z	-4.407761	4.253347	-1.036304	0.3078
AR(1)	0.694732	0.114886	6.047141	0.0000
SIGMASQ	0.004406	0.001407	3.131111	0.0037

The results of the Moderated Regression Analysis (MRA) using the AR(1) method show that the interaction term between the VAT rate and GDP (X1_Z) has a probability value of 0.6061. This value exceeds the 5% significance threshold. Thus, GDP does not moderate the effect of the VAT rate on the value of non-oil and gas imports. In addition, the interaction

term between the exchange rate and GDP (X2_Z) has a probability value of 0.3078, indicating that GDP also does not moderate the effect of the exchange rate on the value of non-oil and gas imports.

1) Coefficient of Determination Test

The coefficient of determination is assessed using the adjusted R-squared value. Based on the MRA estimation, the model obtains an adjusted R-squared value of 0.871205. This indicates that the VAT rate, Rupiah exchange rate, GDP, and the interaction terms between GDP and the independent variables jointly explain 87.12% of the variation in Indonesia's non-oil and gas import value during the first quarter of 2016 to the fourth quarter of 2025. The remaining 12.88% is explained by other factors outside the variables included in the research model.

2) F-Test

The F-test was conducted to examine the simultaneous effect of the VAT rate, Rupiah exchange rate, GDP, and the interaction terms between the independent variables and GDP on Indonesia's non-oil and gas import value. Based on the estimation results, the model obtained an F-statistic of 38.68683 with a probability value of 0.000000. Since the probability value is lower than the 5% significance level, the null hypothesis is rejected. This indicates that the VAT rate, Rupiah exchange rate, GDP, and the interaction terms jointly have a statistically significant effect on Indonesia's non-oil and gas import value during the period from the first quarter of 2016 to the fourth quarter of 2025.

3) T-Test

The t-test was conducted to examine the partial effect of each independent variable, the moderating variable, and the interaction terms on the value of Indonesia's non-oil and gas imports. The results show that the VAT rate (X1) has a probability value of 0.6086, which is greater than 0.05. Therefore, the VAT rate does not have a statistically significant effect on the value of Indonesia's non-oil and gas imports. The Rupiah exchange rate (LN_X2) also has a probability value of 0.3084, which exceeds the 5% significance level, indicating that the Rupiah exchange rate does not have a statistically significant effect on non-oil and gas import value. Furthermore, GDP (LN_Z) has a probability value of 0.3627, indicating that GDP does not have a statistically significant direct effect on non-oil and gas import value. The interaction between the VAT rate and GDP (X1_Z) has a probability value of 0.6061, which is greater than 0.05. Thus, GDP does not moderate the effect of the VAT rate on Indonesia's non-oil and gas import value. Similarly, the interaction between the Rupiah exchange rate and GDP (X2_Z) has a probability value of 0.3078, indicating that GDP does not moderate the effect of the Rupiah exchange rate on non-oil and gas import value.

4.2 Discussion

The results of this study show that the VAT rate, Rupiah exchange rate, and Gross Domestic Product (GDP) do not have statistically significant effects on Indonesia's non-oil and gas import value during the 2016–2025 period. Furthermore, GDP does not significantly moderate the relationship between the VAT rate and non-oil and gas imports or the relationship between the exchange rate and non-oil and gas imports. The findings indicate that Indonesia's non-oil and gas import performance is relatively complex and cannot be explained solely by changes in domestic taxation, exchange-rate movements, or economic activity. The insignificant effect of the VAT rate suggests that changes in VAT policy did not generate a sufficiently strong statistical response in Indonesia's non-oil and gas imports. This finding can be explained through Import Demand Theory, which suggests that import demand is influenced by the prices of imported goods and domestic economic conditions. An increase in VAT may increase the cost of imported products and theoretically reduce import demand. However, based on Elasticity Theory, the magnitude of the response depends on the sensitivity of import demand to changes in prices. Non-oil and gas imports include raw materials, intermediate goods, and capital goods that may be essential for domestic production. When these goods have limited domestic substitutes, import demand may be relatively less responsive to changes in tax-related costs. Therefore, changes in the VAT rate may not necessarily result in an immediate or proportional change in aggregate import demand.

This interpretation is consistent with Benzarti and Tazhitdinova (2021), who found that changes in VAT rates had relatively limited effects on international trade flows, indicating that trade responses to VAT changes may be relatively small. From an economic perspective, the effect of taxation on imports may depend on the characteristics of imported goods and the extent to which taxes affect the final cost faced by importers and users. Some imported goods are consumed directly, whereas others are used as intermediate inputs or capital goods in domestic production. Consequently, firms may continue to import essential production inputs even when the tax burden changes because those goods cannot easily be substituted by domestic products. Therefore, changes in the VAT rate do not necessarily produce an immediate or proportional change in aggregate import demand. The relatively limited variation in the VAT rate during the observation period may also help explain the insignificant result. The VAT rate was maintained at 10% for most of the initial observation period and increased to 11% in April 2022. Thus, compared with other economic variables that fluctuated continuously, the variation in the VAT rate was relatively limited. This condition may reduce the statistical ability of the VAT variable to explain changes in quarterly import values. In addition, taxation represents only one component of the economic cost associated with imports. Therefore, import decisions may be more strongly affected by production requirements, international prices, domestic demand, and global supply-chain conditions.

The findings regarding the VAT rate are consistent with the broader argument that trade flows are determined by

multiple structural and economic factors. Budiman *et al.* (2026) found that Indonesia's manufacturing trade is strongly associated with structural variables such as economic similarity, economic distance, population, and GDP. Importantly, their findings also indicate that the immediate impact of the RCEP agreement and the global pandemic on export volumes was relatively limited, suggesting that international trade responses may involve adjustment lags rather than responding immediately to a single policy change. The exchange rate also does not have a statistically significant effect on Indonesia's non-oil and gas imports. Theoretically, a depreciation of the Rupiah increases the domestic-currency price of imported products and may consequently reduce import demand. However, the actual response of imports to exchange-rate movements depends on the characteristics of imported goods and the degree of dependence on foreign inputs. When imported goods are essential for production, importers may continue purchasing them despite exchange-rate depreciation. Consequently, the expected negative exchange-rate effect may become weaker at the aggregate level.

This finding differs from Swara *et al.* (2012), who found that the U.S. dollar exchange rate had a negative and significant effect on Indonesia's non-oil and gas imports. Their research examined the 1985–2012 period and found that GDP had a positive and significant effect, while the exchange rate had a negative and significant effect on non-oil and gas imports. The difference between their findings and the present study may be associated with differences in the observation period, economic structure, import composition, and external economic conditions. The current study covers 2016–2025, including the COVID-19 pandemic, global supply-chain disruptions, and the subsequent recovery period. These events may have altered the responsiveness of import demand to exchange-rate fluctuations. The insignificant exchange-rate result should therefore not be interpreted as evidence that exchange-rate movements have no economic implications for imports. Instead, it indicates that exchange-rate fluctuations were not sufficiently strong, after accounting for the other variables in the model, to produce a statistically significant effect on aggregate non-oil and gas imports during the observed period. This interpretation is also consistent with the findings of Budiman *et al.* (2026), which demonstrate that international trade flows are influenced by several structural factors rather than by one macroeconomic variable alone.

GDP also does not have a statistically significant effect on non-oil and gas imports. In theory, higher GDP reflects stronger economic activity and may increase import demand through greater household consumption, business investment, and production. Nevertheless, economic growth does not necessarily translate into a proportional increase in imports. Economic expansion may occur alongside increases in domestic production capacity, changes in consumption patterns, import substitution, or changes in the composition of imported goods. Consequently, GDP growth may not automatically generate a statistically significant increase in aggregate non-oil and gas imports.

The finding differs from Swara *et al.* (2012), who found a positive and significant effect of GDP on Indonesia's non-oil and gas imports. This difference reinforces the importance of considering the research period when interpreting the relationship between economic growth and imports. The present study focuses on 2016–2025, a period characterized by significant economic disruptions and structural changes in international trade. Therefore, the relationship between GDP and import demand may not remain constant across different periods. The results of Budiman *et al.* (2026) provide further evidence that GDP is relevant to international trade but does not operate independently of other structural factors. Their study identifies GDP as one of the significant determinants of Indonesia's manufacturing trade, while also emphasizing economic similarity, economic distance, and population. The difference between their findings and the present study may arise because their dependent variable is manufacturing exports to RCEP countries, whereas this study examines Indonesia's aggregate non-oil and gas imports. The different direction of trade, commodity composition, trading partners, and model specifications may therefore produce different empirical results.

The moderation analysis provides an additional contribution of this study. GDP does not significantly moderate the relationship between the VAT rate and non-oil and gas imports. This result indicates that the level of economic activity does not significantly alter the relationship between VAT and import demand. Although stronger economic activity could theoretically increase firms' demand for imported inputs and potentially change their response to taxation, the empirical evidence does not support this mechanism during the 2016–2025 period. The absence of a significant moderation effect may be explained by the relatively small variation in the VAT rate and the fact that import decisions are influenced by numerous factors beyond taxation. Therefore, changes in GDP may not be sufficient to change the effect of the VAT rate on imports. This finding is important because it demonstrates that the presence of GDP as a moderator in a theoretical model does not necessarily guarantee a significant interaction effect. The same conclusion applies to the interaction between the Rupiah exchange rate and GDP. The results show that GDP does not significantly moderate the relationship between the exchange rate and non-oil and gas imports. In other words, the effect of exchange-rate movements on import demand does not statistically differ according to the level of GDP during the observation period.

This finding can be interpreted in light of recent evidence from Kirana (2026) in the Indonesian Journal of Economic Review. Their study explicitly examines GDP as a moderating variable and demonstrates that the moderating role of GDP is not necessarily significant for every relationship tested. This supports the argument that the moderating function of GDP is context-specific. GDP may strengthen or weaken a particular economic relationship under certain circumstances but may have no significant moderating effect in another relationship. The difference between the present findings and studies reporting significant moderation does not necessarily indicate a contradiction. Instead, it may reflect differences

in the dependent variable, observation period, theoretical mechanism, and economic environment. GDP may be more capable of modifying relationships in financial markets or other economic sectors than in aggregate import demand. In the case of Indonesia's non-oil and gas imports, structural factors such as import dependence, domestic production capacity, international commodity prices, and global supply conditions may dominate the potential moderating role of GDP.

The results demonstrate that the absence of statistically significant effects does not mean that VAT, exchange rates, or GDP are economically irrelevant. Rather, the findings indicate that these variables, individually and through their interaction with GDP, did not provide sufficient statistical evidence to explain variations in Indonesia's non-oil and gas imports during the 2016–2025 period. This interpretation is consistent with the broader trade literature, which emphasizes that international trade is determined by a combination of economic size, market characteristics, production structures, and international conditions. Budiman *et al.* (2026), for example, demonstrate that Indonesia's trade flows are shaped by multiple structural determinants rather than by a single macroeconomic variable. Therefore, the findings of this study should be interpreted as evidence that the determinants of Indonesia's non-oil and gas imports are multidimensional. Future research could incorporate variables such as industrial production, domestic consumption, interest rates, trade openness, international commodity prices, foreign exchange reserves, import prices, and global supply-chain conditions. The use of dynamic econometric methods and longer observation periods may also provide additional insights into the short-run and long-run relationships between fiscal policy, exchange rates, economic activity, and Indonesia's non-oil and gas imports.

5 | CONCLUSIONS AND FUTURE WORK

This study examined the effects of the VAT rate and the Rupiah exchange rate on Indonesia's non-oil and gas import value during 2016–2025, while also investigating the role of GDP as a moderating variable. The results demonstrate that the VAT rate does not have a statistically significant effect on Indonesia's non-oil and gas imports. This finding indicates that changes in the VAT rate alone were insufficient to explain variations in aggregate non-oil and gas import values. Import activity is likely influenced by a broader combination of production requirements, imported-input dependence, international prices, domestic demand, and global trade conditions. The Rupiah exchange rate also does not have a statistically significant effect on non-oil and gas imports. Although exchange-rate depreciation theoretically increases the domestic price of imported goods, the empirical results suggest that exchange-rate movements were not sufficient to significantly explain variations in aggregate imports during the study period. This finding differs from previous evidence reported by Swara *et al.* (2012), who found a significant negative effect of the exchange rate on Indonesian non-oil and gas imports. Furthermore, GDP does not have a statistically significant direct effect on non-oil and gas imports. This result indicates that changes in domestic economic activity did not automatically generate significant changes in import demand during 2016–2025. The finding differs from studies that identify GDP as a significant determinant of Indonesian imports, suggesting that the relationship between economic activity and imports may vary according to the observation period and economic conditions.

The moderation analysis shows that GDP does not significantly moderate the relationship between the VAT rate and non-oil and gas imports, nor does it significantly moderate the relationship between the Rupiah exchange rate and non-oil and gas imports. These findings indicate that the level of economic activity did not significantly alter the effects of taxation or exchange-rate movements on import demand. The result is consistent with the view that the moderating role of GDP is context-dependent rather than universal, as demonstrated by Kirana (2026), whose study found that GDP's moderating effect differed across the relationships examined. Overall, this study contributes to the literature by providing empirical evidence that VAT, the Rupiah exchange rate, GDP, and the interaction between GDP and the two independent variables did not significantly explain Indonesia's non-oil and gas import values during 2016–2025. Rather than indicating that these variables are economically irrelevant, the findings highlight the multidimensional nature of Indonesia's import activity and the importance of considering structural, domestic, fiscal, and international factors simultaneously. Future studies may therefore extend the model by incorporating additional determinants of imports and applying dynamic approaches to capture possible short-run and long-run effects.

REFERENCES

- Aulia, R. D., Putri, I. R., & Arianthony, S. (2025). Konsep dasar ekonomi internasional dan teori perdagangan internasional. 2(May), 116–122. <https://doi.org/10.5281/zenodo.15387779>
- Bangun, M. I. H., & Afifuddin, S. (2024). Analysis of effect of real gross domestic product (GDP), exchange rates, inflation, and foreign exchange reserves on the oil and gas and the non-oil and gas imports in Indonesia. 11(February), 467–489. <https://doi.org/10.52403/ijrr.20240250>
- Benzarti, Y., & Tazhitdinova, A. (2021). Do value-added taxes affect international trade flows? Evidence from 30 years of tax reforms. *American Economic Journal: Economic Policy*, 13(4), 469–489. <https://doi.org/10.1257/pol.20190492>
- Budiman, I. F., Monintja, R. J., & Asia, E. (2026). Predicting Indonesia's manufacturing exports in the RCEP region: A machine learning approach to the gravity model of trade. 6(2), 311–327. <https://doi.org/10.59431/ijer.v6i2.763>
- Chakraborty, M., & Maitra, B. (2022). Import demand function in India under the liberalised trade regime. *The Indian Economic Journal*, 70(1), 53–70. <https://doi.org/10.1177/00194662211063563>
- El-Shagi, M., Sawyer, W. C., & Tochkov, K. (2022). The income elasticity of import demand: A meta-survey. *Pacific Economic Review*, 27(1), 18–41. <https://doi.org/10.1111/1468-0106.12357>
- Grübler, J., Ghodsi, M., & Stehrer, R. (2022). Import demand elasticities revisited. *The Journal of International Trade & Economic Development*, 31(1), 46–74. <https://doi.org/10.1080/09638199.2021.1951820>
- Kementerian Keuangan Republik Indonesia. (2024). *Perlakuan pajak pertambahan nilai atas impor barang kena pajak, penyerahan barang kena pajak, penyerahan jasa kena pajak, pemanfaatan barang kena pajak tidak berwujud dari luar daerah pabean di dalam daerah pabean, dan pemanfaatan jasa kena pajak dari luar daerah pabean di dalam daerah pabean*.
- Kharisma, N., & Furqon, I. K. (2021). Analisis dampak kenaikan tarif pajak pertambahan nilai (PPN). 2, 295–303. <https://doi.org/10.61722/jrme.v1i5.3045>
- Kirana, R. (2026). The impact of inflation and government expenditure on economic growth moderated by gross domestic product. 6(2), 423–430. <https://doi.org/10.59431/ijer.v6i2.779>
- Kuswantoro, & Rosianawati, G. (2016). Analisis pengaruh PDB riil, cadangan devisa dan nilai tukar rupiah terhadap impor nonmigas di Indonesia. 6(2), 166–190. <https://doi.org/10.35448/jequ.v6i2.4342>
- Muryani, S., & Hutajulu, D. M. (2023). Analisis pengaruh inflasi, produk domestik bruto dan kurs bagi impor Indonesia. 28(39), 210–224. <https://doi.org/10.35760/eb.2023.v28i2.7290>
- Subiyanto, B., Pradani, T., Digidowiseiso, K., & Virgita, N. (2022). The effects of inflation, exchange rate, and import on value added tax and sales tax of luxury goods. 338–345. <https://doi.org/10.33258/birci.v5i1.3611>
- Sugiyono. (2017). *Metode penelitian*.
- Swara, I. W. Y., Ekonomi, F., & Unud, U. U. (2012). Faktor-faktor yang mempengaruhi impor non-migas Indonesia kurun waktu tahun 1985–2012. 1018–1047. <https://ojs.unud.ac.id/index.php/eep/article/view/14855>

How to cite this article: Vega, P. A., Munawaroh, M., & Djadjuli, M. (2026). VAT, Exchange Rate, and Non-Oil Imports: The Moderating Role of GDP. *Indonesian Journal Economic Review (IJER)*, 6(3), 1420–1429. <https://doi.org/10.59431/ijer.v6i3.971>.