

Determinant of Import in Indonesia

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Received: April 17, 2025; Accepted: August 28, 2025; Published: October 7, 2025

Permalink/DOI: <https://dx.doi.org/10.17977/um002v17i22025p073>

Abstract

Trade activities, particularly import, remain an interesting area of research. Therefore, this research aims to analyze the effect of inflation, Gross Domestic Product (GDP), Bank Indonesia interest rate (BI Rate), and exchange rates on Indonesian import. Quarterly time series data from 2010-2022 were obtained from Bank Indonesia and the Central Bureau of Statistics. Data was then analyzed using the Vector Error Correction Model (VECM) as the estimation tool. The results showed that GDP, interest rate, exchange rate, and inflation rate had a positive effect on import in the short and long term. A key contribution of this research was the use of interest rates (BI rate-BI7 Day Reverse Repo Rate (BI7DRR)) to predict import, which has not been widely used by researchers in Indonesia.

Keywords: import, inflation, exchange rate, Gross Domestic Product (GDP)

JEL Classification: E24, E220, I25, I140

INTRODUCTION

Import activities play a crucial role in shaping a country's trade balance. Discussion on exports and import remains highly relevant, with some research focusing on the use of technology to predict trade flows. For example, Zhu (2025) forecasted the total export-import volume of China's economic trade through machine learning using key indicators such as gross domestic product (GDP) and producer price index (PPI) from 2003 to 2022. However, the discussion in this research is not related to technology, but rather to commonly used macroeconomic and Bank Indonesia interest rate variables.

The growth of import requires careful management to avoid adverse effects on economic activity. In the era of globalization, a high import level can contribute to trade deficits when import activity exceeds exports. This may negatively affect economic activity as consumers tend to purchase products from other countries. Import made from large countries such as India to China has a significant effect. Raju (2024) reported that the effect of import from China on industrial output is positive and significant. Specifically, a 1% change in the share of China's global import was associated with a 0.31% increase in India's output.

Rising foreign exchange prices affect the cost of imported products. Maintaining an appropriate balance of import and exports is crucial for a country as these trading activities potentially affect GDP, exchange rate, as well as inflation

and interest rates (Kramer, 2023; Sahoo & Sethi, 2018; Kreuter & Riccaboni, 2023; Sumantri & Latifah, 2019).

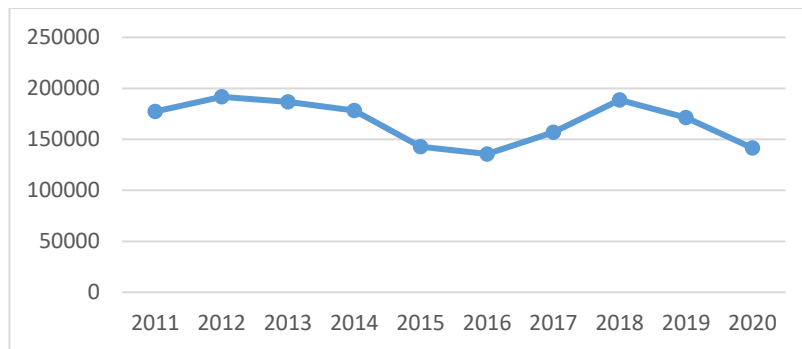


Figure 1. Indonesia Import 2011-2020 (millions of US\$).
Source: Badan Pusat Statistik (BPS)

Figure 1 shows that Indonesia's import fluctuated significantly between 2011-2020, thereby affecting economic activity. The lowest import levels occurred in 2016 at US \$135.652,8 million, followed by 2020 at US \$ 141.568,8 million. The decline in 2016 was due to international market conditions, which did not improve even after the decision to cut production by OPEC. Indonesian economy in 2020 faced an extraordinary crisis attributed to the COVID-19 pandemic, which originated from China and spread rapidly across the globe, subsequently causing significant health and humanitarian issues. The pandemic and the policy measures implemented to address rapid spread restricted social mobility and triggered waves of economic recession in many countries (Bank Indonesia, 2020). This unfavorable development in the global economy is inevitable due to the implementation of mobility restrictions to reduce the spread of COVID-19. Various indicators show that consumption, investment, and production activities in many countries have been severely depressed, resulting in a decline in international trade (Bank Indonesia, 2020).

As economic growth increases, domestic demand also rises, thereby increasing reliance on import to meet this demand. A high demand increases the need for foreign exchange, consequently weakening the domestic currency. Previous research observed a few independent variables of import performance. Hashim and Masih (2014) reported a bidirectional long-term relationship between economic growth and exports, economic growth and import, as well as exports and import. Agung, Ishak, Asngari, and Bashir (2019) examined the ASEAN (Association of Southeast Asian Nations)-Korea Free Trade Agreement, and found that GDP had a significant positive effect on Indonesia's import. Meanwhile, the exchange rate reportedly had no significant effect.

The logical bridge underlying the relationship between import, domestic prices, and inflation can be explained as follows: rising GDP drives an increase in domestic demand, which is partially fulfilled through import. This increase in import not only affects the trade balance, but also domestic price dynamics. Dependence on imported goods, specifically food and energy commodities, has made the economy more vulnerable to global price fluctuations and exchange rates. These conditions are ultimately reflected in the rate of domestic inflation.

Inflation, GDP, Bank Indonesia rate, and exchange rate as macroeconomic variables play an important role in the dynamics of import. In 2020, Consumer Price Index (CPI) inflation was low in line with weak domestic demand and stable supply (Bank Indonesia, 2020). Macroeconomic variables generally move in line with import growth. Inflation in Indonesia is often associated with the public consumption switching between products. Cheaper imported products will certainly attract more consumers (Kartikasari & Khoirudin, 2022). However, to reduce the increase in the inflation rate, a country must import goods to stabilize domestic prices. Inflation occurs when the prices of imported products increase (Richart & Meydianawati, 2014). Inflation caused by import can lead to stagflation, a condition experienced after an economic crisis. Stagflation reflects declining economic activity, resulting in greater unemployment and increased prices of goods. Given that imported goods affect domestic demand, changes in prices trigger inflation.

GDP is another crucial factor influencing import. As GDP increases, import also experience a rise (Sukirno, 2004) in nominal value. GDP reflects economic growth and the increased purchasing power of the people. Higher GDP suggests an improved level of income, which also leads to increased consumption. Import becomes necessary as some of the consumption cannot be met by domestic production. This pattern also reflects an improvement in living standards, as consumers often perceive imported goods to be essential for life.

Previous research has examined the role of macroeconomic variables in cross-border acquisition activities, which are closely connected to import. According to Ibrahim & Raji (2018), the most significant macroeconomic variables influencing the patterns of cross-border mergers and acquisitions outflows of ASEAN-6 countries include interest rate, exchange rate, money supply, and inflation rate. In particular, the currency and interest rate have a considerable negative influence on acquisition outflow, but GDP, money supply, and inflation rate have significantly favorable associations. Meanwhile, four important macroeconomic variables account for the inward acquisition tendencies, including GDP, money supply, inflation rate, and exchange rates. Increasing public consumption is often related to the ability of producers to make products, and import are often one of the alternatives in meeting consumer demand (Pamungkas, Indrawati, & Jalungono, 2018).

The relationship between export-import performance and Indonesia's current account balance has long been a concern for the government and the general public in every quarter of the current year, specifically when facing adverse economic conditions (Bagaskoro & Imansyah, 2019). In the context of globalization, international trade has become increasingly integrated, with national borders posing fewer restrictions on market activity. As an open economy, Indonesia conducts international relations with partner countries, and import plays a crucial role in this interaction. Gupta and Varshney (2021) analyzed the dynamic association between the import industry of India and real exchange volatility. The results showed that exchange rate volatility significantly discouraged import in the short term, while a negative effect was observed in agricultural & allied industries, but not in the manufacturing industry (chemical-related). In addition, the exchange rate volatility shows how India's import significantly affects the U.S.

Although extensive research has been conducted on the effects of the COVID-19 pandemic on trade, relatively few studies have directly investigated the

effect on import. Most existing research has focused on the effect of the COVID-19 pandemic on global trade and production. Empirical results show that the outbreak significantly affected production processes and exports in Europe and Turkey (Seker, 2022). Jaffu et al. (2022) reported that the COVID-19 epidemic had a statistically significant and detrimental effect on the export trade system in Mauritius.

Based on the description above, the questions formulated in this research include: what factors influence import in Indonesia? Does GDP influence import? Do inflation, exchange rates, and BI rate affect import in Indonesia? Therefore, this research aims to analyze the influence of GDP, inflation, exchange rates, and BI rate on import in Indonesia. The result will provide empirical evidence regarding the influence of macroeconomic variables, namely GDP, exchange rates, and inflation, on import. In addition, it can provide input for the government in formulating foreign trade policies, such as import quotas.

THEORETICAL FRAMEWORK AND EMPIRICAL RESEARCH

This section describes the theory of each variable examined, supported by the results of previous research. Subsequently, the hypothesis was immediately formulated based on Sugiyono (2018), who stated that for exploratory research, the hypothesis formulated does not include a positive or negative direction.

Import

Import refers to the activity of purchasing and bringing foreign products into domestic economic activities. The volume of import is often determined by a country production capacity to compete with foreign goods. National income level also plays a role in shaping import value. Using an ADRL approach, Syzdykova et al. (2019) concluded that Kazakhstan's GDP increased with higher import and exports. A 1% rise in import led to a 0.42% increase in GDP over the long term, while a 1% increase in exports resulted in a 0.38% rise in GDP. The exchange rates of Southeast Asian nations were positively affected by import relative to the US dollar (Nurjanah & Mustika, 2021). Import represents the inflow of products from abroad into local public circulation, financed through foreign exchange and regulated by applicable government policies. As reported by Usman & Bashir (2022), import growth is one of the indices for economic growth. The import of products in large quantities usually requires the participation of customs, both in the sending and the receiving countries.

Inflation

Inflation refers to a general and sustained increase in product prices over a certain period (Sato et al., 2011). As inflation rises, the price of domestic products also increases. A price can be classified as inflation when it meets three criteria, namely (1) price increases in general and continuously, (2) persist over time, and (3) lead to a continuous upward trend in the overall price level. Inflation is typically measured monthly, as this period offers an accurate prediction about whether prices have risen in a general and sustained manner (Silitonga, 2021). Previous research has identified inflation as one of the indices for economic stability (Panjaitan & Wardoyo, 2016). It may arise due to an increase in total demand (demand pull inflation) or a decrease in total supply (cost push inflation). Demand-pull inflation

occurs when a business actor is unable to meet consumer demand, often under conditions of full labor use and economic growth. It may also occur during war or unstable political conditions. On the other hand, cost-push inflation arises from rising production costs, often when the economy faces a shortage of workers. This increase in prices and percentage of inflation makes goods from that country unable to compete in the world market. Based on the description of previous research, the hypothesis formulated is as follows:

H1a: Inflation has a significant effect on Indonesia's import in the short term.

H1b: Inflation has a significant effect on Indonesia's import in the long term.

Gross Domestic Product (GDP)

GDP refers to the total added value of all business fields in a country, or the total value of final products produced by all areas of the economy. GDP at current prices reflects the added value of products accumulated through prices prevailing in each year. In contrast, GDP at constant prices shows the added value of a product accumulated through prices from a fixed base year, and is often used to observe shifts and economic structure (Silitonga, 2021). Previous research has identified GDP as a crucial indicator of economic activity (Sulaksono, 2015). It offers insights into production in the form of goods and services. This measure also functions as a benchmark for assessing whether a country is capable of improving the prosperity of its citizens. Ad (2017) found that GDP has a significant effect on import, both in the short and long term. Based on the description of previous research, the hypothesis formulated is as follows:

H2a: GDP has significant effects on Indonesia's import in the short term.

H2b: GDP has significant effects on Indonesia's import in the long term.

Exchange rate

The exchange rate refers to the value of the Indonesian rupiah against the currencies of other countries. It shows the price of one country's currency when exchanged with another (Adeniran et al., 2014). Exchange rate influences activities in the stock market or Money market because investors are quite vigilant when carrying out portfolio investment. Adi (2017) found a negative correlation between import and the exchange rate with the US dollar, indicating that a rise in the exchange rate would lead to a decrease in import. Appreciation and depreciation occur in response to a free-floating exchange rate policy set by market mechanisms. In addition to changes in demand and supply, the exchange rate is also influenced by long-term and short-term capital flows. Using the Error Correction Model (ECM), Br. Purba et al. (2021) examined the effect of GDP, foreign exchange reserves, exchange rates, and inflation on import in Indonesia from 2000 to 2019. The estimation results showed that, although all the variables had a considerable effect on import over the long term, inflation, foreign exchange reserves, and GDP had a positive and significant effect in the short term. Based on the description of previous research, the hypothesis formulated is as follows:

H3a: The exchange rate has a significant effect on Indonesia's import in the short term.

H3b: The exchange rate has a significant effect on Indonesia's import in the long term.

Bank Indonesia Interest Rate (BI Rate)

One of the most significant macroeconomic variables is the interest rate, which essentially refers to a cost that connects the past, present, and future (Mankiw, 2015). The interest rate represents the opportunity cost of holding money in the form of lost opportunities to earn income from interest. In Indonesia, the interest rate set by Bank Indonesia is a signal of the monetary policy implemented by the government (Bank Indonesia, 2021). The policy rate, or BI rate, reflects the central bank's stance on monetary policy and is publicly communicated. Effective August 19, 2016, Bank Indonesia replaced BI rate with BI7 Day Reverse Repo Rate (BI7DRR), strengthening the framework for monetary operations. This adjustment is consistent with international best practices among central banks. To increase policy efficacy in hitting the inflation target, the monetary operations framework needs to be further improved. The BI7DRR instrument is used as the new policy rate due to its ability to quickly affect the money market, banking sector, and real sector (Bank Indonesia, 2022). Research using the BI rate as a predictor for import remains limited in Indonesia (Kurniasari & Monica, 2019). Based on the description of previous research, the hypothesis formulated is as follows:

H4a: BI interest rate has a significant effect on Indonesia's import in the short term

H4b: BI interest rate has a significant effect on Indonesia's import in the long term

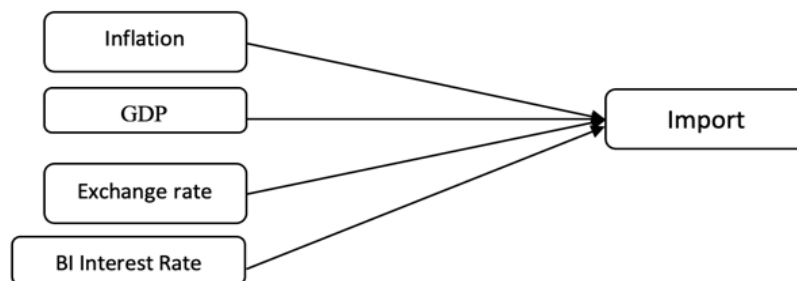


Figure 2. Conceptual Framework

Vacu da Odhiambo (2020) provided a review of theoretical and empirical literature on the main determinants of import demand in developing and developed countries. Factors influencing import demand vary from one country to another and across time, depending on the proxies used for the assessment. Furthermore, the results confirmed that income, whether as a single variable or divided into multiple components, plays a crucial role in determining the primary driver of import demand. Although the degree to which these factors influence import demand varies, most research suggests that relative income and prices are important drivers.

METHOD

The data used were obtained from the Central Statistics Agency (BPS) and Bank Indonesia Report. The period of 2010-2022 was selected to investigate how inflationary fluctuations, GDP, BI rate, and exchange rates influence import.

Due to the use of time series data, the most appropriate econometric model is Vector Autoregression (VAR). VAR model analyzes the interdependent relationship between time series variables and is classified as a system of simultaneous equations. Therefore, it is necessary to examine whether the VAR model can be estimated appropriately. VAR developed by Sims does not require differentiating between endogenous and exogenous variables. All interconnected variables, both endogenous and exogenous, are included in the model (Widarjono, 2007). VAR model equation can be written as follows:

$$\begin{aligned} \text{impor}_t &= \beta_1 + \sum_{i=1}^p \beta_{i1} \text{impor } t - i + \sum_{i=1}^p \alpha_{i1} \text{exch } t - i + \sum_{i=1}^p \gamma_{i1} \text{gdp } t - i \\ &\quad + \sum_{i=1}^p \delta_{i1} \text{infl } t - i + e_{1t} \\ \text{exch}_t &= \beta_2 + \sum_{i=1}^p \beta_{i2} \text{impor } t - i + \sum_{i=1}^p \alpha_{i2} \text{exch } t - i + \sum_{i=1}^p \gamma_{i2} \text{gdp } t - i \\ &\quad + \sum_{i=1}^p \delta_{i2} \text{infl } t - i + e_{2t} \\ \text{gdp}_t &= \beta_3 + \sum_{i=1}^p \beta_{i3} \text{impor } t - i + \sum_{i=1}^p \alpha_{i3} \text{exch } t - i + \sum_{i=1}^p \gamma_{i3} \text{gdp } t - i \\ &\quad + \sum_{i=1}^p \delta_{i3} \text{infl } t - i + e_{3t} \\ \text{birate}_t &= \beta_4 + \sum_{i=1}^p \beta_{i4} \text{impor } t - i + \sum_{i=1}^p \alpha_{i4} \text{exch } t - i + \sum_{i=1}^p \gamma_{i4} \text{gdp } t - i \\ &\quad + \sum_{i=1}^p \delta_{i4} \text{infl } t - i + e_{4t} \\ \text{infl}_t &= \beta_5 + \sum_{i=1}^p \beta_{i5} \text{impor } t - i + \sum_{i=1}^p \alpha_{i5} \text{exch } t - i + \sum_{i=1}^p \gamma_{i5} \text{gdp } t - i \\ &\quad + \sum_{i=1}^p \delta_{i5} \text{infl } t - i + e_{5t} \end{aligned}$$

Individually, the coefficients in the VAR model are often difficult to interpret; hence, econometricians use impulse response analysis, which tracks the response of endogenous variables caused by shocks or changes in the disturbance Correction Model (Vector Error Correction Model (VECM)). The VECM analysis stage is carried out in different steps. The first step is to perform the unit root test, which aims to find out whether the data used is stationary or not. In the next stage, a cointegration test is conducted to determine the analysis. When the data is cointegrated, the analysis used is VECM (Figure 3) (Widarjono, 2007).

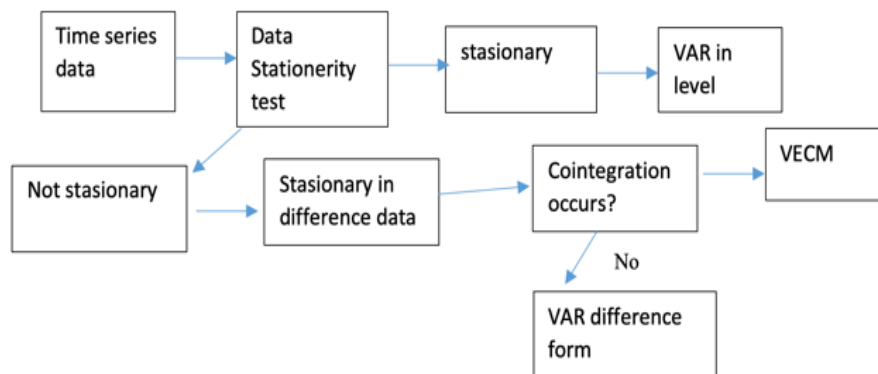


Figure 3. VAR and VECM formation process (Widarjono, 2007).

RESULTS AND DISCUSSION

Data Stationerity Test

Table 1 shows that the import variable is not stationary at the stage ‘level’. The procedure for determining stationarity of data is by comparing the value of the Dickey-Fuller (DF) statistic with the critical value, namely the statistical distribution of t.

Table 1. Stationarity Test Results

Variable	ADF t-statistic	McKinnon Critical Value 5%	Prob.	Information
Import	-2.428.303	-2.919.952	0.1392	Non-stationary
Inflation	-1.485.675	-2.919.952	0.5328	Non-stationary
Exch. rate	-0.867.018	-2.919.952	0.7907	Non-stationary
Birate	-2.265.996	-2.921.175	0.1867	Non-stationary
GDP	-1.427.177	-2.948.404	0.9887	Non-stationary

When the absolute value of the DF statistic exceeds the critical value, the data is considered stationary. Conversely, when the absolute value of the DF statistic is smaller than the critical value, the data is considered non-stationary. Based on the results, all variables in this research were non-stationary. In the next step, differentiation was carried out to find the difference between the data from one period to another in a sequential manner. The results are referred to as first-level differential data (first difference) (Widarjono, 2007).

Table 2. First Difference Data Stationery Test Result

Variable	ADF t-statistic	McKinnon Critical Value 5%	Prob.	Information
Import	-5.834.303	-2.919.952	0.0000	stationary
Inflation	-7.485.675	-2.919.952	0.0000	stationary
Exch. rate	-6.867.018	-2.919.952	0.0000	stationary
Birate	-3.265.996	-2.921.175	0.0000	stationary
GDP	-6.953.177	-2.948.404	0.0000	stationary

Based on the results of the ‘difference’ process in Table 2, all variables are considered stationary. Subsequently, the lag level was determined, and the results are shown in Table 3.

Table 3. Determination of Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1883.083	NA	4.34e+26	75.52330	75.71450	75.59611
1	-1682.122	353.6901*	3.83e+23*	68.48489*	69.63210*	68.92175*
2	-1659.633	35.08347	4.36e+23	68.58531	70.68854	69.38623

Lag length criteria serve to determine the optimal number of lags for VAR or VECM models. Selecting the appropriate lag length ensures that the model is stable, the residuals are not autocorrelated, and the test results are valid. Based on the results, the asterisk (*) in the AIC column, as well as other columns, appears at

lag 1. Table 3 shows the lag length determination used to observe the time taken for each variable to affect the past values.

Cointegration Test (Johansen Cointegration)

Table 4 shows the results of the cointegration test, which aimed to observe the correlation of each variable in the long term. VECM estimation is not used in the absence of correlation in the integration. However, when there is a correlation, the concept of VAR can be used.

Table 4. Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0,05 Critical Value	Prob.**
None*	0.488473	72.63108	69.81889	0.0293
At most 1	0.306956	39.11333	47.85613	0.2558
At most 2	0.202248	20.78026	29.79707	0.3715
At most 3	0.123646	9.482381	15.49471	0.3226
At most 4	0.056031	2.883114	3.841465	0.0895

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

Table 4 shows that at a significance of 5% (0.05), a rank variable correlates with the cointegration. This implies that the variables used have a long-term correlation (cointegration) with each other. Therefore, VECM estimation can be used on this observation.

Table 5. Lag 1 Granger Causality Test Results

Null Hypothesis	Obs	F-statistic	Prob.
DIHK does not Granger cause BIRATE	51	0.00541	0.0242
BIRATE does not Granger cause DIHK		0.75844	0.8555
GDP does not Granger cause EXCH	51	171.043	0.0001
EXCH does not Granger cause GDP		0.43229	0.5140
IMPOR does not Granger cause EXCH	51	171.043	0.0001
EXCH does not Granger cause IMPOR		0.43229	0.5140

Granger causality test results in Table 5 show a one-way relationship in the inflation to the BI rate, GDP to the exchange rate, and import to the exchange rate.

Model Stability Test

Model stability test results show root and modulus numbers ranging from 0.422392-0.974656. These values are required to validate Impulse Response Function (IRF) and Variance Decomposition (VDC) analyses. The stability test shows that the maximum number obtained from the root and modulus number is 0.974656 (less than 1), suggesting the model is stable. Therefore, the acquisition of IRF and VDC analysis is considered valid.

Impulse Response Function (IRF)

IRF contains a forecast of how one variable reacts to others in the future and is used to reflect the level of shock change. Figure 3 shows IRF analysis over the next 10 quarters. Based on the results, the import reaction to the shock of inflation,

exchange rate, GDP, and BI rate in the first to second quarter is positive. However, in the third and fourth quarters, import variables decline significantly, as shown by the downward movement of the response line toward the horizontal axis. The response of import variables to exchange rate shocks in the third and fourth quarters increased. In the fifth and sixth quarters, the response was negative, slowly moving down towards the horizontal axis.

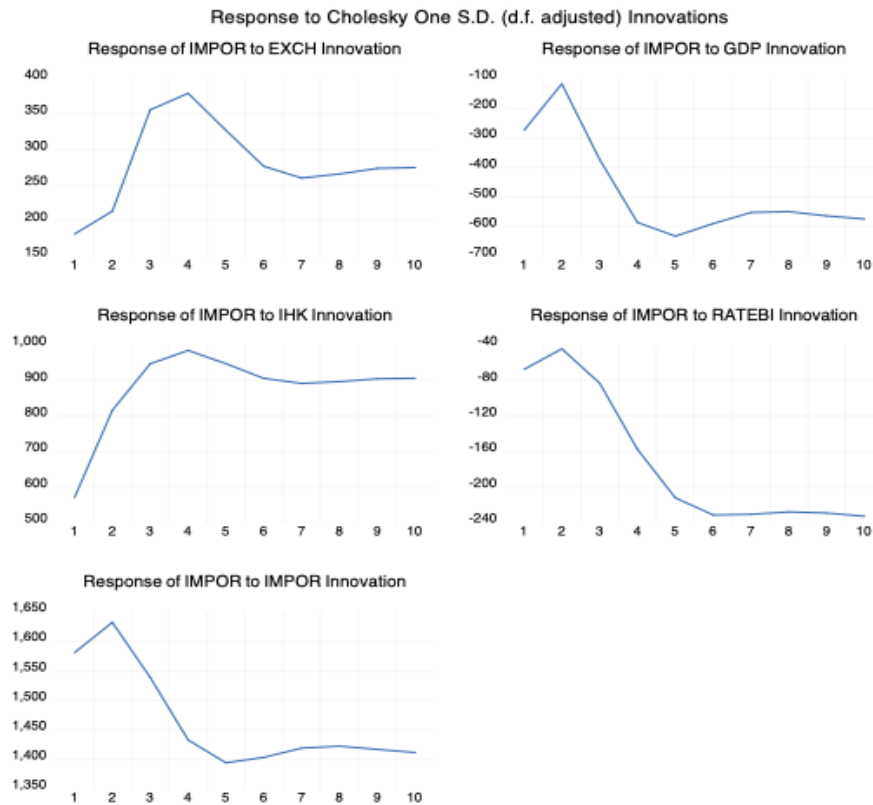


Figure 3. Result from Impulse Response Function (IRF)

The reaction of import to the inflation shock in the first and second quarters shows a positive reaction. This is evident from the upward trend in the first and second quarters, which continued until the fourth quarter. However, in the fifth and sixth quarters, there was a slight decline (leveling off), until finally the line appeared stable (neither rising nor falling) in the seventh to tenth quarters.

Variance Decomposition Analysis Using Cholesky (VDC)

Variance decomposition is used to prepare a forecast error variance of a variable, measuring the difference in variance before and after a shock. This shock might originate from the variable or others. Table 6 shows that in the first quarter, import were quite dependent on the inherent shock. However, in the first quarter, inflation, GDP, exchange rate, and BI rate affected import. From the second to the third quarter, the percentage of import gradually declined. VDC analysis in the second quarter showed that inflation has a 15.67% contribution to import, rising to 19.15% in the third quarter. The percentage continued to increase in the fourth quarter to 21.347%, and then remained stable at about 23% from the seventh to the tenth quarter.

Table 6. Variance Decomposition Analysis Using Cholesky (VDC)

<i>Variance decomposition of IM</i>						
Period	S.E	DIMPOR	DGDP	DEXCH	DIHK	DBIRATE
1	1713.773	85.09024	2.562155	1.111504	11.08189	0.154210
2	2515.310	81.58679	1.404360	1.233961	15.67278	0.102116
3	3141.064	76.31776	2.315294	2.077210	19.15453	0.135198
4	3661.146	71.49028	4.273241	2.604457	21.34737	0.284651
5	4098.744	68.60708	5.796125	2.716287	22.38466	0.495850
6	4479.868	67.24076	6.589735	2.654935	22.83184	0.682727
7	4827.574	66.54239	6.987702	2.576139	23.07683	0.816935
8	5153.581	66.00672	7.271440	2.526296	23.28261	0.912931
9	5461.889	65.49491	7.541946	2.499758	23.47381	0.989576
10	5753.938	65.03270	7.795664	2.480412	23.63520	1.056019

In the first and second quarters, the exchange rate had 1.11% and 1.23% contributions, respectively. The percentage increased up to the fifth quarter, reaching 2.72%. From the sixth to the tenth quarter, there was a gradual decline to 2.4%. For BI rate, the contribution was estimated at 0.154% in the first quarter, but in the second quarter, there was a decrease to 0.102% followed by a slight increase to 0.135%. The BI rate contribution to import slowly rose until the tenth quarter, reaching 1.05%.

Discussion

Interpretation of the Economy

In the short term, all variables had a positive and significant effect on import, hence, hypotheses 1, 2, 3, and 4 were accepted. Based on VDC, GDP, inflation, and BI rate had a positive and significant effect on import in the long term, while the exchange rate had a negative effect. As shown in Table 6, the percentage contribution of exchange rates declined from the ninth and tenth quarters. This result is reinforced by the actual situation in Indonesia, where the average exchange rate of the rupiah in the third quarter of 2021 was Rp14,313 per USD, representing a 1.87% decline (Kementerian PPN/Bappenas, 2021). According to VDC analysis, each variable, namely exchange rate, GDP, BI rate, and inflation, provided different shocks to Indonesian import. The biggest shock was provided by import, which provided support of 65.03% up to the tenth quarter. The performance of import increased by 30.1% (YoY), driven by improved performance in both goods and services. Non-oil and gas goods import increased by 32.9% (YoY), particularly in the commodities of machinery/mechanical equipment, iron and steel, and plastics and plastic goods. Meanwhile, oil and gas goods import rose by 13.3% (YoY) in line with the increase in the value (Kementerian PPN/Bappenas, 2021).

The Effect of Inflation on Import

In the short term, inflation had a positive effect on import as shown in Figure 3. As economic recovery progressed, public demand started to increase. However, due to global supply disruptions, production has been unable to meet demand, leading to inflation in several countries, including Indonesia. The improvement in global economic conditions has strengthened domestic demand from the industrial sector for various types of capital goods. The highest growth was in machinery and

equipment, which grew by 11.5% (YoY). This growth in capital goods occurred in almost all types of machinery, both domestic and imported products (Kementerian PPN/Bappenas, 2021).

The adoption of health regulations aimed at curbing the spread of COVID-19 has disrupted the financial system and the economy. The different health protocols and rules that restricted movement within and between nations have led to a significant decline in investment, productivity, and consumption. Disruptions in global manufacturing chains also resulted in a decline in international trade operations (Bank Indonesia, 2021). Based on Figure 3 (IRF graph), inflationary shocks initially had a positive effect on import, causing a significant rise, but in the long term, the effect became negative. These results are in accordance with research conducted by Pamungkas et.al (2018), who concluded that inflation has a negative effect on import. The rationale is that inflation weakens the domestic currency and raises commodity prices. Therefore, to minimize expenditure, the number of commodities to be imported will also decrease. In the long term, the reaction of import to inflation shows stagnation, neither rising nor falling significantly.

The Effect of GDP on Import

The short-term estimation through the IRF graph shows that GDP affects import, with a significant decline in the second to fourth quarters, followed by a subsequent positive movement. In the long term, shocks to GDP showed a positive response to import. This is supported by VDC results, where the percentage contribution of GDP to import continued to increase to 7.79% in the tenth quarter. In some cases, GDP can affect the import of certain commodities, such as rice, in a direct proportion to public consumption. To meet population demand, the government will have to import rice. Kurniyawan (2014) stated that GDP in the short term did not affect Indonesian rice import, but had a positive and significant effect in the long term. Sartika et al. (2018) also mentioned that GDP influenced sugar import from Thailand. According to Putri & Sentosa (2021), GDP can be interpreted as an economic indicator of national welfare. This metric simultaneously measures two aspects, namely the total expenditure on purchasing goods or services produced in the economy, and the total income of all participants.

The Effect of Exchange Rates on Import

In the short term, the exchange rate shock had a positive effect on import, as shown in the IRF graph (Figure 3). Long-term estimates also showed that the exchange rate significantly affected import. Similarly, previous research conducted by Putri and Sentosa (2021) found that the exchange rate had a positive and significant effect on sugar import in Indonesia. This indicates that sugar import is determined by the value of the rupiah exchange rate against the US Dollar, assuming other factors remain constant. Exchange rates play a critical role in international trade by allowing costs from different countries to be expressed in a common currency. A country's import become more expensive when the currency depreciates versus all other currencies, provided certain other requirements are met.

Effect of BI Rate on Import

In the short-term estimation, the BI rate shock had a positive effect on import, even though a significant decrease occurred in the third quarter, as evidenced by the declining IRF graph line. In the sixth to tenth quarters, interest rate fluctuations caused instability in import. Long-term estimates also showed that BI rate continued to affect imports. This can be explained by Bank Indonesia's policy of maintaining a low interest rate policy and liquidity injection to foster economic recovery. After lowering BI7DRR five times since 2020, Bank Indonesia lowered the rate in February 2021 to 3.50%, the lowest in history (Bank Indonesia, 2021). Declining interest rates reduce the cost of borrowing, thereby making it easier for businesses (importers) to obtain credit for working capital. In addition, a decline in interest rates will also cause domestic demand to rise. Increased consumption and investment raise demand for imported goods, specifically when domestic production is insufficient. According to VDC shown in Table 6, the percentage contribution of BI rate increased continuously until the tenth quarter. This result is in line with Kurniasari and Monica (2019), who stated that interest rates affect import. In general, interest rates affect the volume of export and import in Indonesia. High interest rates will limit public consumption on credit, which in turn reduces loans made by importers, causing a decrease in the value and volume of import.

CONCLUSION

In conclusion, GDP, inflation, BI rate, and exchange rates were found to have a positive and significant effect on import in the short term. Similarly, in the long term, all research variables continued to affect import, as indicated by the varying VDC percentages in each quarter. The data analysis showed that the highest percentage contribution was demonstrated by the inflation variable, suggesting the need for the government to keep domestic prices stable. This is important to ensure that the price of products in the country can compete with imported commodities. Based on the results, domestic business firms should improve the quality of their products to prevent people from purchasing imported goods. A limitation of this research is that it does not include dummy variables as a control, which generally mark the period before and after the COVID-19 pandemic. This is because the research period between 2010 to 2022 did not allow for post-pandemic analysis, as Indonesia declared the pandemic to be over in accordance with Presidential Decree (Keppres) No. 17 of 2023, effective from June 21, 2023.

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