NST
Proceedings
🔒 OPEN ACCESS

Conference Paper

The Economic Determinants of Foreign Exchange Reserve Fluctuations in Indonesia

Dea Rustami*, Septriani Septriani

Department of Development Economics, University of Bengkulu, Indonesia

Corresponding author:
E-mail:
c1a021032.dearustami@mhs.unib.ac.id

ABSTRACT

This research examines the economic factors that drive fluctuations in Indonesia's foreign exchange reserves, concentrating on external debt, global trade activities (exports and imports), and the exchange rate of the Rupiah against the US Dollar. By utilizing secondary data obtained from the World Bank, the research applies multiple linear regression analysis through EViews 12 to assess the influence of these critical variables on foreign exchange reserves. The findings reveal a significant correlation between external debt, exports, and imports with changes in foreign exchange reserves, whereas the exchange rate shows no notable influence. The regression model accounts for 95.81% of the variation in Indonesia's foreign exchange reserves, underscoring external debt, exports, and imports as pivotal factors, while the exchange rate plays a relatively minor role. These insights are crucial for policymakers aiming to ensure economic stability.

Keywords: Foreign exchange reserves, economic determinants, external debt, exports, imports, exchange rate

Introduction

A country's economic development is inherently linked to global economic conditions, where globalization presents significant challenges due to the increasing openness of economies (Subandi et al., 2023). Indonesia, as a country with an open economic system, is increasingly interconnected with the global economy, which is closely related to international relations (Sayoga & Tan, 2017). The era of globalization encourages countries to actively engage in international trade. Within this framework, foreign exchange reserves hold a critical role as the financial backbone for facilitating international trade and advancing national development. Additionally, they are a key indicator reflecting a country's engagement in global trade and its overall economic strength (Uli, 2016).

The fluctuation of foreign exchange reserves significantly influences economic growth, global interest rates, and financial stability, making the availability of adequate reserves essential (Krušković, 2023). Foreign exchange reserves are viewed as a key element of a country's national savings, reflecting the credibility of its monetary policy and its ability to maintain credit trust in the eyes of international financial markets (Arwangsa & Suliswanto, 2023).

In general, foreign exchange reserves are considered safe if they can meet import needs for at least 3 months. If a country's foreign exchange reserves are inadequate to meet import needs during this period, it is deemed risky as it may result in economic challenges, especially the limitation of foreign currency supply (Kuswantoro, 2017). Bank Indonesia (BI) reported that Indonesia's foreign exchange reserves were approximately 146.4 billion USD as of December 2023, up from 138.1 billion USD at the end of November 2023. This increase was due to tax receipts, services, and foreign loans withdrawn by the government. With foreign exchange reserves sufficient to cover about 6.7 months of imports, or 6.5 months if, including government

foreign debt payments, this figure exceeds the international standard, Bank Indonesia suggests maintaining foreign exchange reserves equivalent to at least 3 months of imports. These reserves are considered sufficient to strengthen the external sector's resilience and uphold Indonesia's macroeconomic and financial system stability (Bank Indonesia, 2024).
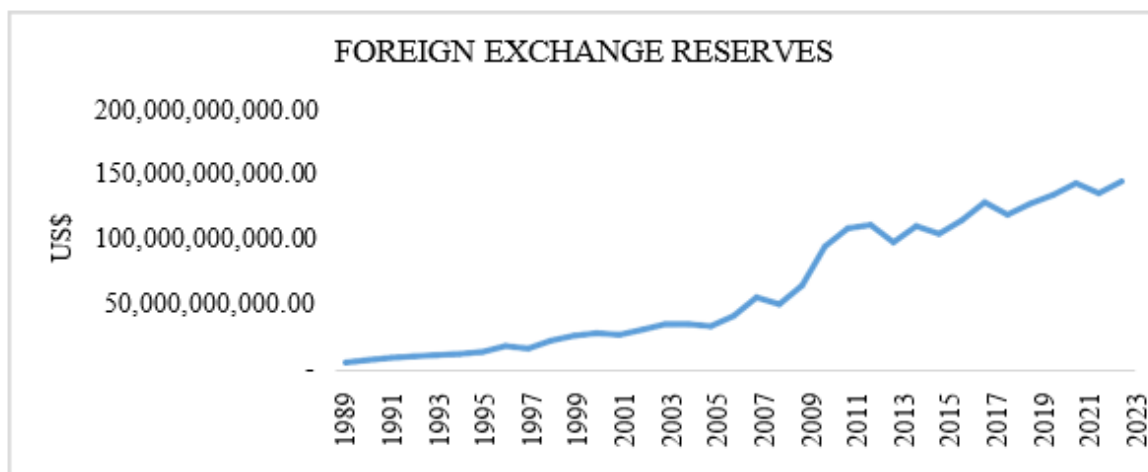

Figure 1. Indonesia's foreign exchange reserves position from 1989 to 2023 (Source: World bank)
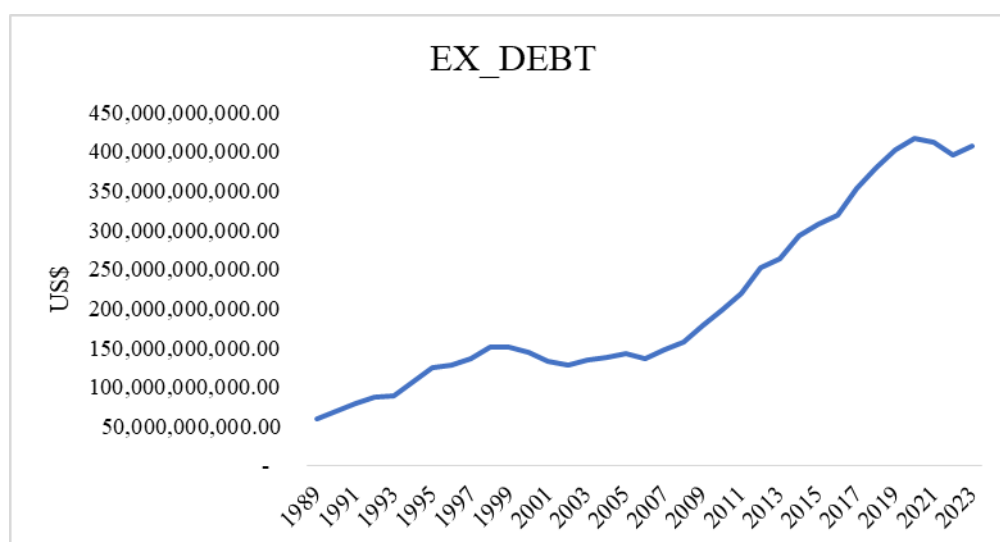

Figure 2. The trend of Indonesia's external debt 1989-2023 (Source: World Bank)

External debt acts as a tool to enhance the accumulation of foreign exchange reserves and reinforce domestic savings. Many developing countries often face various challenges in capitalizing on availableinvestment opportunities, particularly limited domestic savings and a shortage of foreign exchange, which hampers the import of capital goods and intermediate goods crucial for economic development (Natasha & Aminda, 2021). While substantial external debt can exert pressure on a country's foreign exchange reserves due to the need to meet debt obligations in foreign currencies, maintaining sufficient foreign exchange reserves is crucial as a liquidity buffer. These reserves help ensure financial stability, support export-driven economic growth, and serve as an important indicator of a nation's capacity to fulfill external debt obligations (Kebede et al., 2021). The growth in foreign exchange reserves arises not only from export surpluses but also from foreign loans obtained by the government. Most of these loans are

allocated to financing the current account deficit and servicing debt principal and interest payments, which indirectly supports the growth of foreign exchange reserves (Ridho, 2015).

Figure 3. Development of Indonesia's International Trade 1989-2023 (Source: World Bank)

Playing an active role in the global economy, particularly through the export sector, is an important step to increasing foreign exchange reserves. When a country strengthens its export activities, foreign exchange in the form of foreign currencies flows in, strengthening the country's foreign exchange reserves position. If export activities decline, foreign exchange reserves will also decrease. Therefore, the government strives to increase foreign exchange by exporting natural resources to other countries (Maesyaroh & Kundhani, 2024). Export revenue can be allocated to support development, subsequently increasing foreign exchange reserves and bolstering the nation's economy (Sayoga & Tan,2017).

On the other hand, import activities also affect a country's economy. Ekanada (2014) explains that to protect weak domestic producers, countries often restrict the quantity of imports through quotas. These restrictions not only protect domestic producers but also benefit the economy as a whole. The positive impacts of import restrictions include increased preference for local products, reduced foreign exchange expenditures, reduced dependence on imported goods, and strengthened balance of payments. Through exports, a country can obtain foreign currency, while payments for imports must be made in foreign currency. These transactions are recorded by the central bank, and their value is reflected in the balance of payments (Wijayanto & Luase, 2022).

In 2023, although Indonesia's trade balance decreased compared to 2022, it still recorded a surplus of USD 36.93 billion, reflecting the resilience of the national economy against external factors amid the global economic slowdown, commodity price fluctuations, and pressures from major trading partners such as China (KEMENKEU RI, 2023).

Foreign exchange reserves function not only as a medium for settling international transactions but also act as a tool for maintaining macroeconomic stability and financial systems. This function is considered crucial in supporting the national economic recovery post-Covid-19 (Haryono, 2023). The central bank utilizes foreign exchange reserves to influence the local currency's exchange rate. With these reserves, the central bank can regulate the worth of the domestic currency. Exchange rate stability can positively influence society, investment, and international trade. When the exchange rate remains stable, the domestic currency does not experience significant fluctuations, either in terms of appreciation or depreciation. This stability is highly beneficial for companies engaged in international trade (Rangkuty & Hidayat, 2021).

In global trade, especially exports, the exchange rate affects commodity prices. When the exchange rate appreciates, the volume of exports usually declines as domestic products become pricier relative to foreign goods, and the opposite occurs when the exchange rate depreciates (Setyorani, 2018). Fluctuating exchange rates can make products more expensive or more affordable, thus acting as a tool to enhance competitiveness and boost exports. Changes in export volumes are crucial for improving the trade balance. A country's trade balance is categorized as a deficit if exports are lower than imports, a surplus if exports exceed imports, and a balanced if both are equal. Imbalances in trade can be reduced by increasing export volume while decreasing imports (Udiyana & Setiyarti, 2017). Open economies like Indonesia may experience trade deficits; if this condition persists, it couldthreaten economic stability, as foreign exchange reserves are vital for national growth (Arifudin et al., 2024).
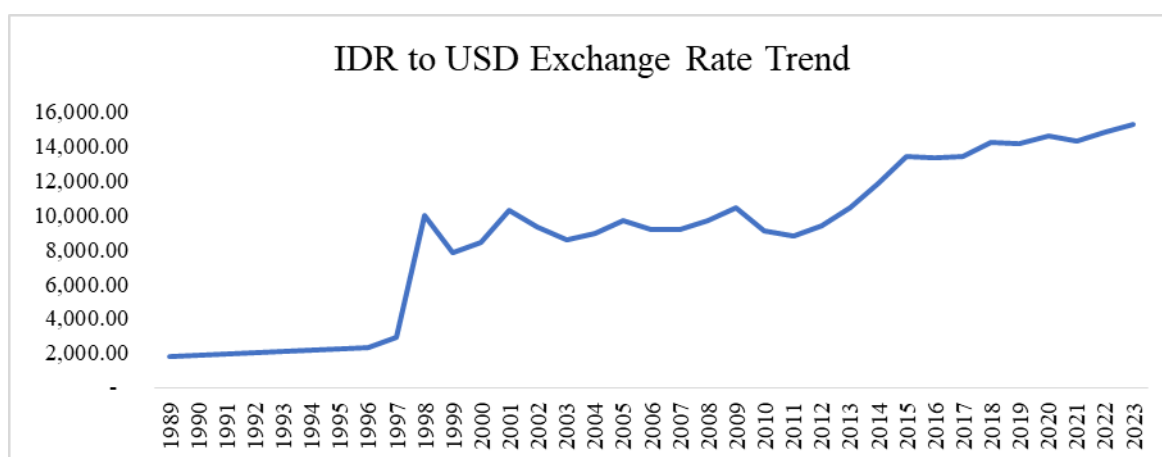

Figure 4. Rupiah exchange rate against the US Dollar from 1989 to 2023 (Source: World Bank)

Many studies have focused on the link between foreign exchange reserves and various economic factors, including external debt, global trade, and currency exchange rates, there remain research gaps that integrate these variables comprehensively within the context of Indonesia. Most research has focused on limited periods or has analyzed only one variable in isolation. For instance, previous studies often fail to explicitly depict how the dynamic relationship between these variables evolved amid significantstructural changes, Examples include the Asian financial crisis of 1997-1998, the global financial crisis of 2008, and the economic effects of the COVID-19 pandemic (KEMENKEU RI, 2023; Maesyaroh & Kundhani, 2024).

This research aims to address these gaps by providing an in-depth examination of the determinants influencing the foreign exchange reserves of Indonesia over the period 1989 to 2023. By covering various significant events in Indonesia's economy, this study seeks not only to understand long-term trends but also to assess structural changes and economic policies that have affected foreign exchange reserves. Focusing on variables such as foreign debt, exports and imports, also exchange rates contributes new insights to the literature on international and local economics, especially concerning Indonesia's economic stability amid global challenges.

Material and Methods

This research adopts a quantitative approach to analyze the impact of different economic variables on the changes in Indonesia's foreign exchange reserves. Secondary data from the World Bank, covering the period from 1989 to 2023, serves as the data source. The foreign exchange reserves are considered the dependent variable, while the independent variables include external debt, exports, imports, and the Rupiah-USD exchange rate.

A time series analysis is conducted to explore the interrelationships between these variables across the specified time frame. The data were retrieved from the World Bank database after

verifying the datasets. Multiple linear regression is employed as the analytical method, preceded by tests for classical assumptions. These assumptions include:

- Normality test to confirm that residuals follow a normal distribution.
- The multicollinearity test assessed the degree of correlation among independent variables.
- The heteroscedasticity test examined whether the variance of residuals was stable.
- Autocorrelation test to evaluate the presence of serial dependency in the dataset.

The multiple linear regression model used in this study is expressed as: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$

Where:
Y: Foreign Exchange Reserves
β_0 : Constant
$\beta_1 - \beta_4$: Multiple Regression Coefficients X1 : External Debt
X2 : Exports X3   : Imports
X4 : Exchange Rate e: Error Term

The t-test evaluated the impact of each independent variable individually, whereas the F-test examined their collective effect on foreign exchange reserves. Furthermore, the coefficient of determination (R^2) measured the extent to which the independent variables accounted for variations in the dependent variable.

The analysis was conducted using EViews 12 software. The findings aim to provide insights into the critical economic drivers behind changes in Indonesia's foreign exchange reserves from 1989 to 2023, forming the basis for evidence-based policy suggestions.

Results and Discussion
Classic assumption test
Normality test

Mutual liability (shared responsibility), which is better known in the field of the civil constitution, is a way in which a contract occurs with many actors. Within the scope of the civil constitution, it is known that there are 2 (two) forms of association and some liability, which are

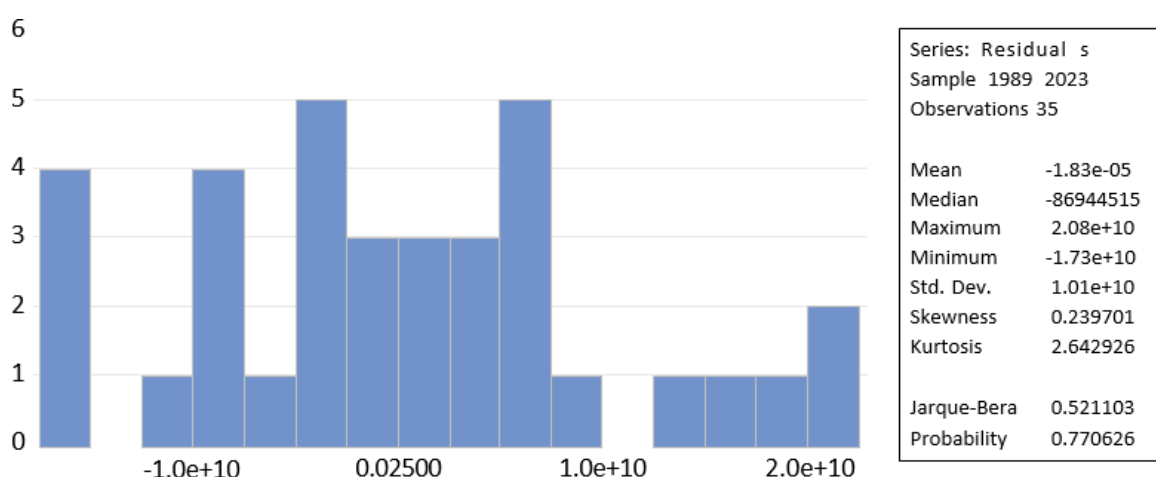| Series: Residual s	
Sample 1989 2023	
Observations	35
Mean	-1.83e-05
Median	-86944515
Maximum	2.08e+10
Minimum	-1.73e+10
Std. Dev.	1.01e+10
Skewness	0.239701
Kurtosis	2.642926
Jarque-Bera	0.521103
Probability	0.770626

Figure 5. Normality test results (Source: Processed Data, 2024)

The outcome of the normality test (Jarque-Bera) indicates that the model's residuals follow a normal distribution, as the p-value exceeds 0.05. This confirms that the normality assumption is met.

Multicollinearity test

Table 1. Multicollinearity test results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	3.19E+19	9.667721	NA
EX_DEBT	0.001937	32.70706	7.507258
EXPT	9.79E-14	5.598870	3.281577
IMPT	0.008706	51.76300	8.682772
EX_RATE	6.87E+11	20.19876	4.070708

Source: Processed Data (2024)

The Centered VIF results reveal no notable multicollinearity in the model, as all VIF values remain below the 10 threshold. This suggests that the independent variables in the model are not strongly correlated with each other.

Autocorrelation test

Table 2. Autocorrelation test results

F-statistic	2.645498	Prob. F(2,28)	0.0886
Obs*R-squared	5.562611	Prob. Chi-Square(2)	0.0620

Source: Processed Data (2024)

At a 5% significance level, both the F-statistic and Obs*R-squared values from the Breusch-Godfrey test indicate no autocorrelation in the regression model as the probability values are greater than 0.05.

Heteroscedasticity test

Table 3. Heteroscedasticity test results

F-statistic	2.231433	Prob. F(14,20)	0.0494
Obs*R-squared	21.33882	Prob. Chi-Square(14)	0.0933
Scaled explained SS	12.87848	Prob. Chi-Square(14)	0.5361

Source: Processed Data (2024)

The p-value of 0.0933, as indicated by Prob. Chi-Square (14) on Obs*R-Squared, is greater than 0.05. This suggests that the regression model is homoscedastic, meaning there is no violation of the heteroscedasticity assumption.

Multiple linear regression analysis

Table 4. Multiple linear regression analysis results

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	-2.50E+10	5.65E+09	-4.419608	0.0001
EX-DEBT	0.217894	0.044009	4.951080	0.0000
EXPT	7.56E-07	3.13E-07	2.416371	0.0220
IMPT	0.249567	0.093304	2.674762	0.0120
EX_RATE	718964.8	829099.9	0.867163	0.3927
R-squared	0.958075			
Adjusted R-squared	0.952485			
S.E. of regression	1.07E+10			
To be continued...				

Sum squared resid	3.46E+21
Log likelihood	-855.3754
F-statistic	171.3922
Prob (F-statistic)	0.000000

Source: Processed Data (2024)

Parameter significance test
Partial test (t-Test)

The statistical analysis applies a one-tailed test with a significance level of $\alpha = 5\%$. When the t-statistic surpasses the critical value from the t-table, the null hypothesis (H0) is discarded, indicating that the independent variable has a significant effect on the dependent variable. Conversely, if the t-statistic falls below the t-table value, the null hypothesis is not rejected, suggesting that the independent variable does not significantly influence the dependent variable.

- External Debt (EX_DEBT): The t-statistic for external debt stands at 4.951080, exceeding the critical t-table value of 2.042. Additionally, the p-value is 0.0000, which is significantly below the 0.05 significance threshold. This indicates that external debt has a noteworthy impact on foreign exchange reserves, implying that shifts in external debt are strongly correlated with fluctuations in foreign exchange reserves.
- Exports (EXPT): With a t-statistic of 2.416371 and a probability value of 0.0220, which is under the 0.05 significance level, exports exhibit a meaningful association with Indonesia's foreign exchange reserves. This suggests that changes in export levels significantly affect the variation in foreign exchange reserves.
- Imports (IMPT): The t-statistic for imports is 2.674762, accompanied by a p-value of 0.0120, both of which are below the 0.05 significance level. This signifies that imports play a crucial role in determining foreign exchange reserves, with fluctuations in import activity having a marked effect on the reserves.
- Exchange Rate (EX_RATE): The t-statistic for the exchange rate is 0.867163, which is smaller than the t-table critical value of 2.042, and the p-value of 0.3927 exceeds the 0.05 significance level. This suggests that the exchange rate does not have a significant impact on foreign exchange reserves. In other words, the changes in the exchange rate do not meaningfully influence the reserves in this context.

Simultaneous test (F-Test)

The F-test plays a key role in assessing the overall validity of the regression model. In this context, the null hypothesis (H0) asserts that all regression coefficients, except for the constant, are equal to zero, indicating that the independent variables do not have a significant effect on the dependent variable. On the other hand, the alternative hypothesis (H1) suggests that at least one coefficient of the independent variables is non-zero, implying that at least one independent variable has a meaningful influence on the dependent variable.

The F-statistic is 171.3922, with a probability value of 0.000000, which is significantly lower than the 0.05 significance level. As a result, the null hypothesis is rejected, indicating that the regression model as a whole is statistically significant. This implies that at least one of the independent variables has a notable impact on the dependent variable (foreign exchange reserves). The results of the F-test underline the model's strong capability to explain the fluctuations in foreign exchange reserves, with the independent variables playing a crucial role in driving these variations.

Coefficient of determination (R^2 Test)

The R^2 test is used to assess how well the regression model accounts for the variation in the dependent variable based on the independent variables. The R^2 value ranges between 0 and 1,

with values closer to 1 indicating a better fit, as the model explains more of the variability in the dependent variable.

In this study, the R^2 value of 0.958075 implies that roughly 95.81% of the variation in foreign exchange reserves is explained by the independent variables in the regression model. This suggests a strong explanatory power of the model.

Additionally, the Adjusted R-squared value is 0.952485, which, although slightly lower than the R^2, is still high. This demonstrates that the model remains a reliable representation of the data even when the number of independent variables is taken into account. These results underscore the importance of including the independent variables in the model, as they significantly enhance the ability to explain the changes in the dependent variable.

Based on the estimation results, the following equation can be derived:

RESERVES = -25,000,000,000 + 0.217894EX_DEBT + 0.000000756EXPT + 0.249567IMPT

From the multiple linear regression analysis, the interpretation is as follows:

- Intercept (C = -25,000,000,000): When all independent variables are zero, the foreign exchange reserves are estimated to be -25 billion. While it is unlikely that all independent variables would be zero, this negative value represents the model's baseline.
- External Debt (EX_DEBT): A coefficient of 0.217894 suggests that a 1% increase in external debt would lead to an increase of 0.217894 USD in foreign exchange reserves, holding other variables constant.
- Exports (EXPT): A coefficient of 0.000000756 suggests that a 1% increase in exports would lead to an increase of 0.000000756 USD in foreign exchange reserves, holding other variables constant.
- Imports (IMPT): A coefficient of 0.249567 indicates that a 1% increase in imports would lead to an increase of 0.249567 USD in foreign exchange reserves, holding other variables constant.

The effect of foreign debt on foreign exchange reserves

Statistical analysis shows that foreign debt has a notable effect on Indonesia's foreign exchange reserves. The increasing foreign debt has been consistently correlated with a rise in foreign exchange reserves, demonstrating a robust link between the two variables. This finding aligns with previous studies that reported a positive and significant relationship between foreign debt and foreign exchange reserves (Batubara et al., 2023; Susanti, 2019). Foreign debt can be leveraged to boost foreign exchange and savings, particularly in developing nations that often struggle with limited domestic savings and foreign exchange shortages, which constrain the import of essential capital goods and semi-finished products necessary for economic growth. While foreign debt can temporarily strengthen foreign exchange reserves via loans, each loan contributes to the accumulating debt that needs to be repaid. The repayment of this debt, relying on foreign exchange reserves, raises long-term financial obligations (Natasha & Aminda, 2021). In the short run, foreign debt enhances reserves, but over time, the need to settle principal and interest in foreign currencies depletes those reserves (Suripto et al., 2022).

In some cases, foreign exchange reserves can increase by taking foreign loans, although ultimately this debt must be repaid, potentially leading to a decrease in reserves. Initially, foreign borrowing has a positive impact. However, factors such as the lack of domestic savings affect the effectiveness of investments. Therefore, governments in developing countries often have to rely on foreign investment and loans to spur economic growth (Savira, 2024). Rasyidin et al. (2023) explain that foreign debt can positively impact Indonesia's foreign exchange reserves as foreign currency loans can be used to finance strategic projects and increase reserves. However, the country must ensure sufficient reserves to pay interest and principal on loans to maintain economic stability and reduce dependence on foreign debt.

According to the debt overhang theory, high debt accumulation can hinder economic growth. This is due to increasing interest payments, which in turn reduce investment levels, both domestic and foreign, and decrease foreign exchange reserves. Although foreign debt can be used to cover development funding gaps, poor management may burden the national budget and reduce the government's ability to meet public needs (Amalia & Titik, 2022). This study's findings are also consistent with Wahnidar's (2019) discovery of a positive and significant relationship between foreign debt and foreign exchange reserves. Citing the Three Gap Model theory, Wahnidar states that whena country faces a current account deficit, inflows of capital, including foreign debt, are needed to finance that deficit. Foreign debt serves to cover the current account deficit, repay debt, support the reserves held by monetary authorities, cover the government's budget deficit, and bridge the gap between savings and investment. However, the increase in foreign debt year after year can add to the long-term burden, as debt repayments and interest require large amounts of foreign exchange.

The effect of exports on foreign exchange reserves

Exports have a significant relationship with foreign exchange reserves, underscoring that export fluctuations substantially contribute to changes in the foreign exchange reserves of Indonesia. This finding highlights the importance of the export sector in maintaining the stability of foreign exchange reserves, making strategies to boost exports an effective measure to strengthen the nation's reserves. This aligns with Keynes' theory of the balance of payments, supported by studies by Dwinoviyanto et al. (2023) and Sayoga and Tan (2017). Exports generate income for the country through foreign exchange earnings from international transactions, where higher export volumes lead to greater foreign exchange earnings. This increase in foreign exchange becomes a key driver of economic growth, enabling the country to accelerate development and improve public welfare   (Natasa et al., 2023).

In 2023, Indonesia's total exports amounted to USD 258.77 billion, with the non-oil and gas sector contributing USD 242.85 billion and the oil and gas sector USD 15.92 billion. The non-oil and gas sector was dominated by the processing industry (76.84%), with palm oil as the main commodity, followed by the mining sector (21.35%) led by coal, and the agricultural sector (1.81%) with coffee as the primary commodity (BPS, 2023). Regular exports enable Indonesia to earn foreign exchange from importing countries, playing a crucial role in supporting economic development. Increased exports reflect high productivity, boost international trade activities, and strengthen foreign exchange as a primary source of national income (Rianda, 2020).

As exports rise, foreign exchange reserves increase through international transactions paid in foreign currencies. Exports play a significant role in the economy, particularly as they contribute to around 70% of Indonesia's total foreign exchange reserves (Anwar et al., 2019). This finding is consistent with prior studies by Arwangsa and Suliswanto (2023) and Jalunggono et al. (2020), which highlighted a positive and significant correlation between exports and foreign exchange reserves.

Furthermore, increased foreign exchange from exports supports funding for imports and infrastructure development, making exports a vital instrument for maintaining national economic stability. By continuously enhancing export competitiveness through commodity diversification, product quality improvement, and market expansion, Indonesia can optimize foreign exchange earnings. This emphasizes that the export sector is not only a driver of economic growth but also a primary pillar of foreign exchange reserve stability (Simamora & Widanta, 2021).

The effect of imports on foreign exchange reserves

Import demonstrates a significant impact on foreign exchange reserves, as indicated by the t-statistic exceeding the significance threshold. This underscores that fluctuations in import volumes have a tangible effect on Indonesia's foreign exchange reserves. An increase in imports, particularly luxury goods, contributes to foreign exchange reserves through luxury goods value-

added tax (PPnBM) payments, emphasizing the importance of import policy management in maintaining foreign exchange stability. This finding aligns with previous studies affirming the significant influence of imports on foreign exchange reserves (Ariyani & Hasanah, 2023).

Theoretically, increased imports tend to reduce foreign exchange reserves, as foreign currency is utilized to finance import transactions. However, imports also support exports, as many of Indonesia's export commodities rely on imported raw materials. The greater availability of raw materials supports manufacturing production to boost exports, indirectly contributing to foreign exchange reserves (Aceh et al., 2023).

From 1989 to 2023, Indonesia's import trends generally outpaced exports, creating trade deficits in many years. Although Indonesia's exports grew significantly, reaching USD 263.16 billion in 2023, reliance on imported goods, including raw materials and consumer goods, remains a challenge. In 2023, imports were dominated by intermediate goods (72.81%), followed by capital goods (17.62%) and consumer goods (9.58%). The main non-oil and gas imports included machinery, electrical equipment, iron and steel, plastics, and wheat (BPS, 2024).

The significant influence of imports on foreign exchange reserves is further supported by the findings of Amalia and Titik (2021), who noted that rupiah depreciation against the USD increases import prices. This reduces import volumes but raises import values due to inelastic demand. Currency depreciation also increases export volumes due to the elasticity of export demand, ultimately leading to higher foreign exchange reserves. Similar findings were presented by Hermawan (2019), Pujirahayu (2020), and Asmara et al. (2018), showing that imports do not alwaysnegatively impact foreign exchange reserves.

From a mercantilist perspective, a surplus of exports over imports is considered essential to boost foreign exchange reserves, and support economic growth. However, in Indonesia's case, high imports of raw materials and capital goods have supported foreign investment, particularly given the low labor costs (Apriadi & Setiawina, 2022). Nevertheless, excessive reliance on imports remains a structural challenge that must be carefully managed to ensure the stability of foreign exchange reserves and trade balance.

The effect of exchange rates on foreign exchange reserves

The results of the study indicate that the exchange rate does not exert a statistically significant influence on foreign exchange reserves. While there are hints of a positive relationship, the evidence is not strong enough to assert that exchange rate fluctuations significantly influence foreign exchange reserves. This implies that other factors likely play a more dominant role in determining the foreign exchange reserves of Indonesia. Exchange rate fluctuations, speculative activities in the market, and inconsistent foreign currency needs in international transactions further reinforce this conclusion (Herliani & Sukarniati, 2024). These findings align with the Marshall-Lerner elasticity theoryand various previous studies (Fortuna et al., 2021; Bake et al., 2024). According to this theory, currency depreciation should enhance export competitiveness and improve the current account balance. However, In Indonesia, foreign exchange reserves do not always show a significant response to exchange rate fluctuations, due to factors including low demand elasticity for both exports and imports, structural limitations, the predominance of monetary policy interventions, and external factors. The correlation between exchange rate fluctuations and foreign exchange reserves remains relevant since higher reserves strengthen a country's ability to engage in international transactions, reinforce currency stability, and reflect economic resilience. However, the study shows that exchange rate fluctuations do not significantly impact foreign exchange reserves. Structural barriers and lowvolumes of speculative transactions in the foreign exchange market contribute to the market's limitedresponse (Rozi, 2017). This finding is supported by other studies, which highlight thatexchange rate fluctuations, though present, are insufficiently significant in influencing short-term foreign currency needs (Oktariva & Sari, 2024).

Historical data on the rupiah-to-dollar exchange rate from 1989 to 2023 reveal a long-term depreciation trend with periods of sharp fluctuations, particularly during the 1998 economic crisis. In1989, the exchange rate stood at IDR 1,770 per USD, gradually increasing to IDR 2,909 in 1997. The1998 crisis caused a sharp depreciation to IDR 10,014, stabilizing at IDR 7,855 in 1999. Despite periods of stability, the exchange rate remained volatile and continued its gradual depreciation, reaching IDR 15,237 in 2023 (World Bank, 2024). This trend underscores the persistent depreciationof the rupiah against the USD, influenced by various external and domestic factors.

This research aligns with the findings by Permana and Faridatussalam (2022) and Mashita and Pangidoan (2020), This indicates that exchange rate fluctuations have a limited impact on Indonesia's foreign exchange reserves. The primary contributing factors are the small volume of speculative transactions and the temporary foreign currency needs in international business dealings. In conclusion, the foreign exchange reserves of Indonesia are more significantly influenced by other key factors, suchas monetary policy interventions and global economic conditions, rather than exchange rate fluctuations alone.

Conclusion

The analysis results indicate that external debt, exports, and imports significantly influence foreign exchange reserves, while the exchange rate does not have a significant impact, suggesting that exchange rate fluctuations do not directly affect foreign exchange reserves in this context. The regression model employed demonstrates strong explanatory power, as most of the variations inforeign exchange reserves can be explained by the independent variables used. To support better management of foreign exchange reserves, it is recommended to ensure sustainable external debt management, develop policies that promote the export sector, and monitor import policies to maintain reserve stability. Additionally, it is crucial to continue analyzing the impact of exchange rate fluctuations in a broader context to manage foreign exchange reserves optimally and support national economic stability.

Acknowledgment

References

Aceh, A. Y., Rahim, M., & Ilyas, I. (2023). Analisis pengaruh ekspor, impor, nilai tukar, dan suku bunga terhadap cadangan devisa di Indonesia. *JEP (Jurnal Ekonomi Pembangunan (JEP), 13*(1), 850-860

Amalia, S., & Titik, C. S. (2022). Pengaruh impor, nilai tukar rupiah, dan utang luar negeri terhadap cadangan devisa Indonesia. *Buletin EkonomikaPembangunan, 2*(1), 1-36. https://doi.org/10.21107/bep.v2i1.13847

Anwar, A. I., Djamal, B. P., & Nurbayani, S. U. (2019). Effects of foreign loans, interest rate, and export for the foreign exchange reserves in Indonesia 2002-2016. *Hasanuddin Economicsand Business Review 3*(2), 59. https://doi.org/10.26487/hebr.v3i2.1942

Apriadi, G. N. S., & Setiawina, N. D. (2022). Pengaruh ekspor, impor, inflasi, dan kebijakan acfta terhadap cadangan devisa Asean-5 Periode 2005 – 2019. *E-Jurnal Ekonomi Dan Bisnis Universitas Udayana*, *11*(5), 535-536. https://doi.org/10.24843/eeb.2022.v11.i05.p03

Arifudin, N. A., Nurhidayah, N. S., Sintiya, N. S., Afifudin, N. A., & Nabih, N. a. N. (2024). Pengaruh ekspor dan impor terhadap neraca perdagangan di Indonesia. *Moneter, 2*(3), 01–08. https://doi.org/10.61132/moneter.v2i3.562

Ariyani, N. P., & Hasanah, N. (2023). Pengaruh impor, utang luar negeri, pajak impor terhadap cadangan devisa Indonesia. *Account: Jurnal Akuntansi, Keuangan dan Perbankan, 10*(1), 1874-1880.

Arwangsa, N. B. I., & Suliswanto, N. M. S. W. (2023). Analysis of the effect of exports, imports and foreign debt on Indonesian foreign exchange reserves in 2011-2021. *Conference on Economic and Business Innovation (CEBI),* 937–950. https://doi.org/10.31328/cebi.v3i1.423

Asmara, F., Citra, R., & Setyowati, E. (2018) Analisis pengaruh ekspor, impor, kurs, inflasi dan utang luar negeri terhadap cadangan devisa Indonesia Periode Januari 2014-September 2017. *Skripsi thesis.* Universitas Muhammadiyah Surakarta.

Bake, P. A., Hodijah, S., & Nurjanah, R. (2024). Analisis pengaruh ekspor, kurs dan utang luar negeri terhadap cadangan devisa Indonesia. *E-Journal Perdagangan Industri Dan Moneter, 12*(1), 36-50. https://doi.org/10.22437/pim.v12i1.35840

Bank Indonesia. (2024). Cadangan devisa Desember 2023 meningkat. https://www.bi.go.id/id/publikasi/ruang-media/news-release/Pages/sp_260324.aspx

Batubara, A. E., Marliyah, M., & Tambunan, K. (2023). Pengaruh utang luar negeri, al-sharf, dan ekspor terhadap cadangan devisa negara Indonesia. *Reslaj Religion Education Social Laa Roiba Journal, 6*(1), 530–541. https://doi.org/10.47467/reslaj.v6i1.4565

Dwinoviyanto, F. A., Rotinsulu, T. O., & Tumangkeng, S. Y. (2023). Analisis pengaruh ekspor, tingkat kurs, investasi dan utang luar negeri sektor ekonomi terhadap cadangan devisa di Indonesia Tahun Periode 2016: Q1-2022: Q4. *Jurnal Berkala Ilmiah Efisiensi, 23*(8), 25-36.

Ekananda, M. (2014). *Ekonomi Internasional.* Jakarta: Erlangga

Fortuna, A. M., Muljaningsih, S., & Asmara, K. (2021). Analisis pengaruh eskpor, nilai tukar rupiah, dan utang luar negeri terhadap cadangan devisa Indonesia. *Equilibrium Jurnal Ilmiah Ekonomi Manajemen Dan Akuntansi, 10*(2), 113-120. https://doi.org/10.35906/je001.v10i2.779

Haryono, E. (2023). *Cadangan Devisa September 2022* Tetap Tinggi. Departemen Komunikasi, Bank Indonesia.

Herliani, H., & Sukarniati, L. (2024). Analisis Pengaruh Ekspor, Foreign Direct Investment (FDI), Nilai Tukar, dan Inflasi Terhadap Cadangan Devisa di Negara Asean-6 Tahun 2011-2022. *Socius: Jurnal Penelitian Ilmu-Ilmu Sosial, 1*(11), 1-15.

Hermawan, M. H. (2019). Pengaruh inflasi, kurs, impor dan ekspor terhadap cadangan devisa Indonesia. *Diploma thesis*, Universitas Balikpapan. http://repository.uniba- bpn.ac.id/1385/

Jalunggono, G., Cahyani, Y. T., & Juliprijanto, W. (2020). Pengaruh Ekspor, Impor Dan Kurs Terhadap Cadangan Devisa Indonesia periode tahun 2004 – 2018. *Jurnal Ekonomi Bisnis dan Akuntansi, 22*(2), 171–181. https://doi.org/10.32424/jeba.v22i2.1593

Kebede, S., Zerihun, G., Berhanu, K., & Abebe, T. (2023). The role of foreign public debt on foreign exchange reserve in SSA countries: Does governance really matters? *Cogent Economics & Finance, 11*(2), 2223810. https://doi.org/10.1080/23322039.2023.2223810

Kemenkeu RI. (2023). https://www.kemenkeu.go.id/informasi-publik/publikasi/berita-utama/Surplus-Neraca-Perdagangan-Indonesia-Tahun-2023

Krušković, B. D. (2023). Econometric VAR analysis of the effect of the foreign exchange reserves on macroeconomic variables in emerging countries: the case of BRIC countries. *Journal of Central Banking Theory and Practice, 12*(3), 87–109. https://doi.org/10.2478/jcbtp-2023-0026

Kuswantoro, M. (2017). Analisis pengaruh inflasi, kurs, utang luar negeri dan ekspor terhadap cadangan devisa Indonesia. *Tirtayasa Ekonomika, 12*(1), 146. https://doi.org/10.35448/jte.v12i1.4442

Maesyaroh, N. W. U., & Kundhani, E. Y. (2024). Analisis faktor-faktor yang mempengaruhi cadangan devisa. *Jurnal Ilmu Ekonomi JIE, 8*(01), 92–109. https://doi.org/10.22219/jie.v8i01.29769

Masitha, I. P., & Pangidoan, E. (2020). Pengaruh suku bunga, nilai tukar rupiah, inflasi, ekspor dan impor terhadap cadangan devisa di Indonesia. *Jurnal Sains Ekonomi, 1*(1), 1-8.

Natasha, V., & Aminda, R. S. (2021). Analisis determinasi cadangan devisa di Indonesia. *Prosiding Seminar Nasional & Call for Paper STIE AAS, 4*(1), 778–790.

Oktariva, W., & Sari, Y. P. (2024). Determinan cadangan devisa di Indonesia. *Media Riset Ekonomi Pembangunan (MedREP)*, *1*(2), 211–219.

Permana, D. A., & Faridatussalam, S. R. (2022). Analisis pengaruh ekspor, impor, nilai tukar, dan inflasi terhadap cadangan devisa Indonesia Tahun 1996-2020. *Ekonomikawan: Jurnal Ilmu Ekonomi dan Studi Pembangunan, 22*(1), 146-158.

Pujirahayu, A. (2020). Analisis pengaruh ekspor, impor, nilai tukar, dan inflasi terhadap cadangan devisa Indonesia Tahun 1994-2018. *Program Studi Ilmu Ekonomi Studi Pembangunan Fakultas Ekonomi Dan Bisnis Universitas Muhammadiyah Surakarta.*

Rangkuty, D. M., & Hidayat, M. (2021). Does foreign debt have an impact on Indonesia's Foreign Exchange Reserves? Ekuilibrium Jurnal Ilmiah Bidang Ilmu Ekonomi, 16(1), 85–93. https://doi.org/10.24269/ekuilibrium.v16i1.2021.pp85-93

Rasyidin, M., Saleh, M. S., & Rizkina, A. (2023). Pengaruh suku bunga, pinjaman luar negeri dan ekspor terhadap cadangan devisa di Indonesia. *TIN Terapan Informatika Nusantara, 3*(10), 405–413. https://doi.org/10.47065/tin.v3i10.4130

Rianda, N. C. N. (2020). Pengaruh ekspor impor terhadap cadangan devisa di Indonesia. *At-Tasyri Jurnal Ilmiah Prodi Muamalah,* 165–173. https://doi.org/10.47498/tasyri.v12i2.384

Ridho, M. (2017). Pengaruh ekspor, hutang luar negeri dan kurs terhadap cadangan devisa Indonesia. *e-Journal Perdagangan Industri dan Moneter, 3*(1), 1–9. https://doi.org/10.22437/pim.v3i1.3987

Rozi, F. (2017). *Pengujian kondisi Marshall-Lerner dan Fenomena J-curve pada neraca perdagangan Indonesia dengan 5 Negara Mitra Dagang Utama.* http://repository.unej.ac.id/handle/123456789/100787

Savira, M. (2024) Inklusi Keuangan dalam penguatan ekonomi domestik di tengah ketidakpastian ekonomi global: Higher for longer. *S2 thesis*. Universitas Andalas.

Sayoga, P., & Tan, S. (2017). Analisis cadangan devisa Indonesia dan faktor-faktor yang mempengaruhinya. *Jurnal Paradigma Ekonomika, 12*(1), 25–30. https://doi.org/10.22437/paradigma.v12i1.3931

Setyorani, B. (2018). Pengaruh nilai tukar terhadap ekspor dan jumlah uang beredar di indonesia. *Forum Ekonomi*, *20*(1), 1. https://doi.org/10.29264/jfor.v20i1.3307

Simamora, R. M. H., & Widanta, A. A. B. P. (2021). The effect of export value, exchange rate, and inflation on Indonesia's foreign exchange reserves. *International Journal of Innovative Science, Engineering & Technology, 8*(5), 494-499.

Subandi, A., Kasem, Akma, I. R., & Raya, F. (2023). Pengaruh perdagangan internasional terhadap pertumbuhan ekonomi Indonesia Periode 2020-2023. *Jurnal Ekonomi Manajemen Dan Bisnis (JEMB), 1*(2), 80-84.

Suripto, S., Setiawan, R. R., Istanti, I., & Mustofa, H. (2023). An analysis of factors affecting indonesia's foreign exchange reserve. *Optimum Jurnal Ekonomi Dan Pembangunan, 12*(2), 223–235. https://doi.org/10.12928/optimum.v12i2.6588

Susanti, T. (2020). Pengaruh utang luar negeri, ekspor, kurs, dan inflasi terhadapa cadangan devisa Indonesia tahun 2013-2017. *Institutional Repository UIN Sunan Kalijaga Yogyakarta. (n.d.).* http://digilib.uin-suka.ac.id/id/eprint/40367

Udiyana, I. B. G., & Setiyarti, T. (2017). Fluktuasi nilai kurs dan inflasi pengaruhnya terhadap ekspor impor dan neraca perdagangan Indonesia tahun 2007-2015. *Forum Manajemen, 15*(1), 76–86. https://doi.org/10.61938/fm.v15i1.156

Uli, L. B. (2016). Analisis cadangan devisa Indonesia. *Jurnal Perspektif Pembiayaan dan Pembangunan Daerah, 4*(1), 15–24. https://doi.org/10.22437/ppd.v4i1.3529

Wahnidar, W. (2019). Pengaruh ekspor, inflasi dan utang luar negeri terhadap cadangan devisa di Indonesia. *Doctoral dissertation.* Universitas Negeri Makassar

Wijayanto, A., & Luase, N. M. E. 2022. Analisis Pengaruh ekspor dan impor terhadap cadangan devisa Indonesia. *Yos Soedarso Economic Journal (YEJ)*. 4, 1 (Apr. 2022), 12–27.

World Bank. (2024). https://databank.worldbank.org/source/world-development-indicators/Series/PA.NUS.FCRF