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THE ROLE OF FOREIGN DEBT, EXPORTS, AND EXCHANGE RATES IN INCREASING INDONESIA'S FOREIGN EXCHANGE RESERVES

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Abstract

Indonesia's foreign exchange reserves fluctuate due to global and domestic economic dynamics. The problem lies in how key economic factors can maintain the stability and sustainability of national foreign exchange reserves. This study aims to determine the role of foreign debt, exports, and exchange rates in increasing Indonesia's foreign exchange reserves. This research uses secondary data obtained from the World Bank. The analysis method uses Ordinary Least Squares (OLS) with multiple linear regression. The results show that foreign debt, exports, and exchange rates have a positive effect on Indonesia's foreign exchange reserves. The implications of this research show that the government needs to strengthen the coordination of fiscal and monetary policies to maintain the stability of foreign exchange reserves. Foreign debt management must be directed toward productive financing that drives exports and economic growth. In addition, a stable and adaptive exchange rate policy is necessary to maintain foreign exchange reserves amid global economic changes.

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INTRODUCTION

Foreign exchange reserves are foreign currency assets held by central banks or governments, which serve to maintain exchange rate stability, finance imports of strategic goods and services, meet foreign debt obligations, and act as a buffer against external economic shocks. (Abdul Rahaman et al., 2022; Naima et al., 2024). In general, a country's foreign exchange reserve level reflects the fundamental strength of its economy and market confidence in its ability to withstand external pressures. International standards recommend that foreign exchange reserves should be sufficient to finance at least three months of imports, thereby maintaining economic stability. In Indonesia, foreign exchange reserves continue to fluctuate in line with global economic dynamics. Based on Bank Indonesia data, in December 2024, foreign exchange reserves were recorded at 155,7 billion, an increase from US$150.2 billion in the previous month. This increase was driven by commodity export revenues and government foreign debt withdrawals. Furthermore, in March 2025, foreign exchange reserves reached a record high of US$157.1 billion, before declining to 148,7 billion in September 2025. Despite this decline, the position remains strong, as it is equivalent to financing approximately six months of imports and government foreign debt payments. The decline was influenced by the payment of foreign debt obligations and Bank Indonesia's measures to stabilize the rupiah exchange rate amid global economic uncertainty.

Indonesia's foreign exchange reserves are currently under pressure due to a combination of internal and external factors that have weakened their position in recent months. According to Bank Indonesia data, foreign exchange reserves stood at US$148.7 billion in September 2025, down from US$150.7 billion in the previous month. This decline was caused by the government's foreign debt payments and Bank Indonesia's intervention to stabilize the rupiah exchange rate amid global economic turmoil. Although still above the international adequacy standard, this fluctuating trend indicates vulnerability to changes in global interest rates, capital outflows, and financial market volatility. In the context of macroeconomics, the relationship between foreign debt, exports, and exchange rates plays a crucial role in shaping the dynamics of foreign exchange reserves. Foreign debt, if managed productively, can increase the supply of foreign currency through the inflow of external funds to finance development projects that increase export capacity. However, if not balanced by foreign exchange earnings, interest and principal payments on debt will actually deplete foreign exchange reserves.

Foreign debt is an important instrument in financing economic development, especially for developing countries such as Indonesia. (Kurniasih, 2024). This debt can be used to cover budget deficits, finance infrastructure projects, and support foreign exchange reserves through additional foreign currency supplies. However, excessively high levels of foreign debt can place a heavy burden on the economy. The obligation to pay interest and principal on foreign currency debt can deplete foreign exchange reserves, put pressure on the exchange rate, and increase the risk of a debt crisis if not balanced by adequate export capacity and foreign exchange earnings.

Conversely, if foreign debt is too low, the country may lose the external financing needed to accelerate economic growth. Therefore, balance is crucial—foreign debt must be managed effectively so that it generates future foreign exchange earnings, rather than simply adding to the fiscal burden. In the context of foreign exchange reserves, foreign debt has a dual role: on the one hand, it can increase reserves through the inflow of external funds, but on the other hand, it can reduce them when foreign debt obligations are paid. With careful, transparent, and productivity-oriented debt management, foreign debt can be a strategic instrument in maintaining the stability and resilience of national foreign exchange reserves. Research by Rahim et al. (2019), Arwangsa & Suliswanto (2023), Rangkuty & Hidayat (2021), and Andriyani et al. (2020) shows that foreign debt has a significant positive impact on foreign exchange reserves. Unlike the research conducted by Fakhrurrazi & Juliansyah (2021),

which states that in the long term, foreign debt does not affect a country's foreign exchange reserves. This indicates a correlation between a country's foreign debt and its foreign exchange reserves.

Exports are a major component of the economy that plays a significant role in increasing a country's foreign exchange reserves. Through exports, countries earn foreign currency that can be used to finance imports, pay foreign debt obligations, and maintain exchange rate stability. (Dissanayake & Kethmi, 2021). An increase in exports will strengthen the trade balance and add to foreign exchange reserves, thereby stabilizing the country's external position. Conversely, if exports decline, foreign exchange earnings will decrease and may put pressure on the exchange rate and reduce economic resilience. Export proceeds can be used to pay interest and principal on debt without having to deplete foreign exchange reserves. When foreign debt is high but supported by strong exports, the risk to foreign exchange reserves can be minimized because there is sufficient inflow of foreign exchange. However, if foreign debt is high and exports are weak, pressure on foreign exchange reserves will increase significantly. Therefore, improving export performance, particularly in high-value-added and globally competitive sectors, is very important to strengthen the foreign exchange position, maintain economic stability, and reduce dependence on external financing.

Previous research conducted by Arwangsa & Suliswanto (2023), Guampe et al. (2023), Saleha et al. (2021), and Panggabean (2025) The export shows a positive and significant impact on foreign exchange reserves in Indonesia. However, unlike the research conducted by Tarmidi & Tri (2021) Show that exports do not have an impact on foreign exchange reserves. Suripto et al. (2023) Explain that exports in the long term do not have an impact on foreign exchange reserves. The differences in the research results show that the effect of exports on foreign exchange reserves has not been entirely consistent across different periods and methods of analysis. This indicates that other factors, such as exchange rate stability, export structure, and global economic conditions, also influence the relationship between exports and Indonesia's foreign exchange reserves.

Exchange rate fluctuations can affect foreign exchange inflows and outflows through exports, imports, and foreign debt payments. (Ramadhani et al., 2025). When the rupiah weakens, exports become more competitive because Indonesian goods become cheaper in the international market, thereby increasing foreign exchange earnings. However, on the other hand, the depreciation of the rupiah also increases the burden of foreign debt payments denominated in foreign currencies, which can deplete foreign exchange reserves if exports are unable to cover these foreign exchange needs. Conversely, when the exchange rate is too strong, exports become less competitive, while imports increase, which has the potential to put pressure on the trade balance and reduce foreign exchange reserves. In this context, exchange rate stability is crucial to maintaining external balance and supporting the resilience of foreign exchange reserves. A stable exchange rate provides certainty for economic actors, encourages investment, and keeps foreign capital flowing in. Therefore, appropriate monetary policy and foreign exchange market intervention are necessary to keep the exchange rate at a level that supports a balance between economic growth, foreign debt management, and the stability of national foreign exchange reserves.

Previous research conducted by Zulfikar & Syafira (2024), Jumman et al. (2025), Maghfiroh & Anggraeni (2024), and Sukarniati et al. (2025) The exchange rate shows a positive impact on foreign exchange reserves in Indonesia. Fakhrurrazi & Juliansyah (2021) Finding a short-term negative effect of the exchange rate on foreign exchange reserves, an increase in the exchange rate correlates with a decrease in reserves. Thabana & Fasanya (2024) State that some countries show a negative/insignificant relationship between exchange rates and reserves, depending on the exchange rate regime and economic structure.

This study aims to determine the effect of foreign debt, exports, and exchange rates on Indonesia's foreign exchange reserves. Indonesia was chosen for this study because it is a developing country with an open economic structure and high dependence on international trade and external financing. Fluctuations in foreign debt, exports, and exchange rates have a significant effect on Indonesia's macroeconomic stability, especially in maintaining foreign exchange reserves. In addition, Indonesia often faces external pressures such as changes in global interest rates, exchange rate volatility, and the dynamics of export commodity prices. Given these conditions, Indonesia is a relevant case study for understanding how the interaction between these external factors affects the resilience of foreign exchange reserves and national economic stability.

It is hoped that the results of this study can make a real contribution to the formulation of macroeconomic policy in Indonesia, particularly in the management of foreign debt, increasing exports, and stabilizing exchange rates. This research is expected to provide an in-depth understanding of the factors that affect foreign exchange reserves, so that the government and monetary authorities can devise effective strategies to maintain economic resilience. In addition, the results of this study are expected to serve as a reference for future researchers in examining the dynamics of Indonesia's external sector and strengthening sustainable and globally competitive economic development policies.

RESEARCH METHODS

This study adopts a quantitative research approach with time series data obtained from the World Bank for the period 1994–2023. The independent variable in this study uses foreign exchange reserves, which are measured by the total equivalent value of all liquid external assets owned and controlled by a country's central bank. The independent variables include foreign debt, measured by the outstanding external debt position (government + private sector) at the end of the period; exports, measured by the total export volume in thousands of tons; and the exchange rate, measured by the nominal exchange rate of the rupiah per USD. Table 1 shows the measurement of the research variables.

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Table 1. Variable Measurement

Variable	Measurement
Foreign Exchange Reserves	The total equivalent value of all liquid (Current US$)
Foreign Debt	the outstanding external debt position (Current US$)
Export	the total export volume (thousands of tons)
Exchange Rate	The nominal exchange rate of the rupiah per USD

Source: processed by author (2025)

This study uses Ordinary Least Squares (OLS) analysis to estimate the linear relationship between dependent and independent variables by minimizing the sum of squares between observed values and predicted values. The goal is to obtain unbiased, efficient, and consistent coefficient estimates. OLS is often used in regression analysis to measure the effect of independent variables on dependent variables and to test the significance of these relationships using t-tests and F-tests. The formula for the multiple linear regression model equation is as follows.

$$\text{LogCDN} = \text{C} + 1\text{LogULN} + \beta 2\text{LogEXP} + \beta 3\text{LogKurs} \quad (1)$$

Where:

LogCDN : Foreign Change Reserves
LogULN : Foreign Debt
LogEXP : Export
LogKurs : Exchange Rate

RESULTS AND DISCUSSION

Result

The first one, Classical assumption testing on time series data, is performed to ensure that the regression model used produces valid, efficient, and unbiased

estimates. This test is important so that the analysis results can reflect the actual relationship between variables without being affected by problems such as autocorrelation, heteroscedasticity, multicollinearity, and normality. Thus, classical assumption testing ensures the reliability of the model and improves the accuracy of decision-making based on the estimation results.

The normality test results show that the residual data are normally distributed. This is based on the Jarque-Bera probability value of 0,413961, which is greater than the general significance level of 0.05. The multicollinearity test results show that the VIF values of all variables are below 10. The heteroscedasticity test results using the White test proxy show a Prob. Chi-squared(9) value above 5% with a value of 0.2507, and the results of the autocorrelation test with the LM Test passed the autocorrelation test with a Prob. Chi-squared(2) value of 0.1924. It can be concluded that the research data passed the classical assumption test.

Multiple Linear Regression

The t-test in the Ordinary Least Squares (OLS) regression model is used to test the partial or individual effect of each independent variable on the dependent variable. This test aims to determine whether the estimated regression coefficient is statistically significant in explaining the effect of the variable. A variable is considered to have a significant effect if its probability value (Sig. or p-value) is less than the significance level of 0.05, or if its t-value is greater than the t-table value.

Table 2. Multiple Linear Regression Result

	Coefficient	t-Statistic	Sig.
C	-5,957911	-7,586504	0,0000
LogULN	0,451925	3,585267	0,0014
LogEXP	0,767786	7,458485	0,0000
LogKurs	0,273073	3,301490	0,0028
R squared	0,965475		
Adjusted R-squared	0,961492		
F Statistic	242,3520		
Prob (F Statistic)	0,000000		

Source: processed by author (2025)

C is constant, LogCDN is foreign exchange reserves, LogULN is foreign debt, LogEXP is export, and LogKurs is the exchange rate. The regression equation results from the model are as follows:

$$\begin{aligned} \text{LogCDN} = {} & -5{,}957911 + \\ & 0{,}451925\text{LogULN} + \\ & 0{,}767786\text{LogEXP} + \\ & 0273073\text{LogKurs} \end{aligned} \quad (2)$$

The regression results show a very strong model in explaining the factors that influence foreign exchange reserves. An Adjusted R-squared value of 0,961492 implies that approximately 96.1% of the variation in foreign exchange reserves can be explained collectively by the variables of foreign debt, export volume, and exchange rate. The strength of this model is also supported by the Prob (F-Statistic) value of 0,000000, which confirms that simultaneously, all independent variables have a very significant effect on foreign exchange reserves, making this model suitable for use.

The regression model shows that all independent variables (LogULN, LogEXP, and LogKurs) have a significant effect on the dependent variable (LogCDN) because the probability value of each is < 0.05. LogULN (foreign debt) has a positive coefficient of 0,4519 with a p-value of 0,0014, meaning that an increase in foreign debt has a positive and significant effect on foreign exchange reserves. LogEXP (exports) has a coefficient of 0,7678 and is significant (p-value 0,0000), indicating that exports have the strongest and most positive effect on the increase in foreign exchange reserves. LogKurs (exchange rate) also has a positive and significant effect (coefficient 0,2731; p-value 0,0028), indicating that changes in the exchange rate also significantly affect foreign exchange reserves.

Discussion

The results of the study show that foreign debt (LogULN) has a positive and significant effect on foreign exchange reserves (LogCDN). This finding indicates that an increase in foreign debt contributes to an increase in Indonesia's foreign exchange reserves. Economically, this relationship is reasonable because loan funds from abroad are received in the form of foreign currency, which directly adds to the national foreign exchange reserves. The government often utilizes foreign debt to maintain exchange rate stability, finance current account deficits, and strengthen Bank Indonesia's ability to intervene in the foreign exchange market. This research is supported by Rahim et al. (2019), Arwangsa & Suliswanto (2023), Rangkuty & Hidayat (2021) and Andriyani et al. (2020) Show that foreign debt has a significant positive impact on foreign exchange reserves.

This positive relationship also shows that foreign debt remains an important source of external financing for Indonesia. However, its benefits are highly dependent on the purpose and use of the debt. If loans are used for productive activities such as infrastructure development, strengthening exports, and increasing industrial capacity, then the impact on foreign exchange reserves will be sustainable because it will encourage an increase in foreign exchange earnings in the future. Conversely, if the debt is used for consumptive spending or to cover budget deficits, the increase in reserves will only be temporary and may cause pressure when interest and principal payments fall due.

In addition, these findings illustrate the government's strategy in maintaining external stability and investor confidence. In unstable global conditions, foreign debt becomes an instrument to strengthen the position of foreign exchange reserves so that the economy remains resilient to external pressures. Thus, although foreign debt has a positive effect on foreign exchange reserves, debt management must be carried out carefully and purposefully. The government needs to ensure that loans are allocated to productive sectors and accompanied by sound risk management, so that this positive relationship is truly sustainable and supports long-term economic resilience.

In this research, export (LogEXP) has a positive and significant effect on foreign exchange reserves (LogCDN). This finding illustrates that an increase in exports contributes directly to an increase in Indonesia's foreign exchange reserves. Theoretically, this relationship is very logical because exports are one of the main sources of foreign exchange earnings for a country. Every time a transaction involving the export of goods and services occurs, the country receives payment in foreign currency, so that the greater the value of exports, the greater the accumulation of foreign exchange reserves held by the monetary authorities. This result was supported by Arwangsa & Suliswanto (2023), Guampe et al. (2023), Saleha et al. (2021), and Panggabean (2025) The export shows a positive and significant impact on foreign exchange reserves in Indonesia.

In the context of the Indonesian economy, exports play an important role in maintaining macroeconomic stability, especially in the external sector. Strong foreign exchange reserves enable Bank Indonesia to stabilize the rupiah

exchange rate, finance strategic imports, and meet foreign obligations. In other words, increasing exports not only strengthens the trade balance but also enhances the national economy's resilience to external shocks, such as commodity price fluctuations or global economic uncertainty. Structurally, Indonesia is a country with an export base dominated by primary commodities such as coal, palm oil (CPO), rubber, and mining products. Global commodity price spikes usually increase export values, which in turn increase foreign exchange reserves. However, dependence on commodities makes this relationship quite sensitive to price changes in the world market. Therefore, the sustainability of increasing foreign exchange reserves through exports is highly dependent on the diversification of export products and the strengthening of the manufacturing sector and high-value-added export-oriented industries.

The positive and significant relationship between exports and foreign exchange reserves can also be explained in terms of the external economic multiplier effect. When exports increase, there is an increase in foreign currency inflows that can be used to strengthen external liquidity, finance imports of raw materials, and grow investment. In the long term, increased exports also expand national production capacity, drive economic growth, and strengthen international competitiveness. Thus, the positive effect of exports on foreign exchange reserves is not only direct but also creates a sustainable economic cycle. However, this relationship also poses challenges. When export values increase due to high global demand, there is the potential for excessive exchange rate appreciation, which can reduce export competitiveness in the following period (the Dutch Disease phenomenon). Therefore, careful foreign exchange and exchange rate management policies are still necessary to ensure that increased exports do not cause structural imbalances.

From a policy perspective, these results underscore the importance of strengthening the export sector as a key pillar of foreign exchange reserve resilience. The government needs to expand non-traditional export markets, encourage diversification into high-value-added products, and improve logistics efficiency and human resource quality in the international trade sector. In addition, maintaining stability in trade and exchange rate policies will help ensure that foreign exchange earnings from exports can be optimally utilized to strengthen the country's external position.

The last hypothesis shows that the exchange rate (LogKurs) has a positive and significant effect on foreign exchange reserves (LogCDN). This finding indicates that changes in the rupiah exchange rate against the US dollar play an important role in determining the size of Indonesia's foreign exchange reserves. This positive relationship shows that when the exchange rate increases, which means a depreciation of the rupiah, foreign exchange reserves also tend to increase. Economically, this result illustrates the close relationship between monetary stability, trade performance, and foreign exchange management policies. This finding was supported by Zulfikar & Syafira (2024), Jumman et al. (2025), Maghfiroh & Anggraeni (2024), and Sukarniati et al. (2025) The exchange rate shows a positive impact on foreign exchange reserves in Indonesia.

Theoretically, the positive relationship between exchange rates and foreign exchange reserves can be explained through the trade balance mechanism. When the rupiah weakens, the price of Indonesian exports becomes more competitive in the international market because they are cheaper in foreign currencies. As a result, exports increase and bring in additional foreign currency, which directly adds to foreign exchange reserves. Conversely, depreciation also makes imports more expensive, thereby encouraging a decline in import demand. This combination of increased exports and decreased imports improves the trade balance and increases foreign exchange accumulation at Bank Indonesia.

Exchange rate changes also affect capital flows. Controlled depreciation can increase the attractiveness of domestic assets to foreign investors, as the potential for profits in foreign

currency becomes greater. Increased capital inflows will increase foreign exchange reserves, especially if followed by monetary policies that consistently maintain inflation and interest rate stability. In this context, the positive relationship between exchange rates and foreign exchange reserves reflects Bank Indonesia's ability to manage external stability through exchange rate policies that are adaptive to global dynamics. However, this positive relationship cannot be interpreted simply as meaning that depreciation is always good for foreign exchange reserves. If depreciation occurs sharply and uncontrollably, it can have a negative effect on macroeconomic stability. An excessively weak exchange rate can increase the burden of foreign debt payments and put pressure on the raw material import sector, which ultimately erodes foreign exchange reserves. Therefore, exchange rate stability is a key factor in ensuring that this positive relationship remains sustainable and does not cause excessive inflationary pressure or external risks.

These findings confirm that stable and credible exchange rate management is crucial to maintaining the resilience of foreign exchange reserves. The government and Bank Indonesia need to continue strengthening fiscal and monetary policy coordination, keeping inflation low, and ensuring a smooth inflow of foreign exchange from exports, investment, and tourism. Foreign exchange market intervention policies also need to be implemented selectively to curb excessive volatility without hindering exchange rate flexibility in adjusting to external pressures. In addition, it is important to increase non-traditional sources of foreign exchange, such as remittances from Indonesian migrant workers (TKI), tourism, and foreign direct investment (FDI), so that foreign exchange reserves are not overly dependent on exchange rate fluctuations alone. Diversifying sources of foreign exchange will make the relationship between the exchange rate and foreign exchange reserves more stable and sustainable.

CONCLUSION

From the findings of the analysis and discussion, it can be concluded that the variables of foreign debt, exports, and exchange rates have a positive and significant effect on foreign exchange reserves in Indonesia. This shows that these three factors play an important role in strengthening the country's external position. Foreign debt contributes through additional foreign currency supply, exports increase foreign exchange earnings from international trade activities, and a well-managed exchange rate improves the trade balance and attracts foreign capital flows. These findings emphasize the importance of coordinated economic policy management, including debt control, strengthening the export sector, and stabilizing exchange rates. With effective and productivity-oriented management, these three factors can support the sustainability of Indonesia's foreign exchange reserves and strengthen national macroeconomic stability amid global economic dynamics.

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