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Determinant Of Foreign Exchange Reserves In Indonesia For The Year 2000-2023

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ABSTRACT

The study aims to analyze the effect of exchange rates, GDP, inflation, interest rates and state budget deficits on foreign exchange reserves in Indonesia from 2000-2023. The research uses secondary and Ordinary Least Squares to answer the goal. The results show that exchange rate and GDP partially have a positive and significant effect on foreign exchange reserves in Indonesia. Meanwhile inflation, interest rates, state budget deficits have no effect. Government policy implications include maintaining exchange rates to maintain currency value stability, enhancing exports to increase foreign exchange earnings, offering export incentives like subsidies and technological support, and advancing economic development through increased investment, productivity improvements, and infrastructure development. These strategies can help boost foreign exchange reserves, expand international operations, and ensure the stability of the country's economy.

Keywords: foreign exchange reserves; exchange rate; GDP; inflation; interest rate and state budget deficit.

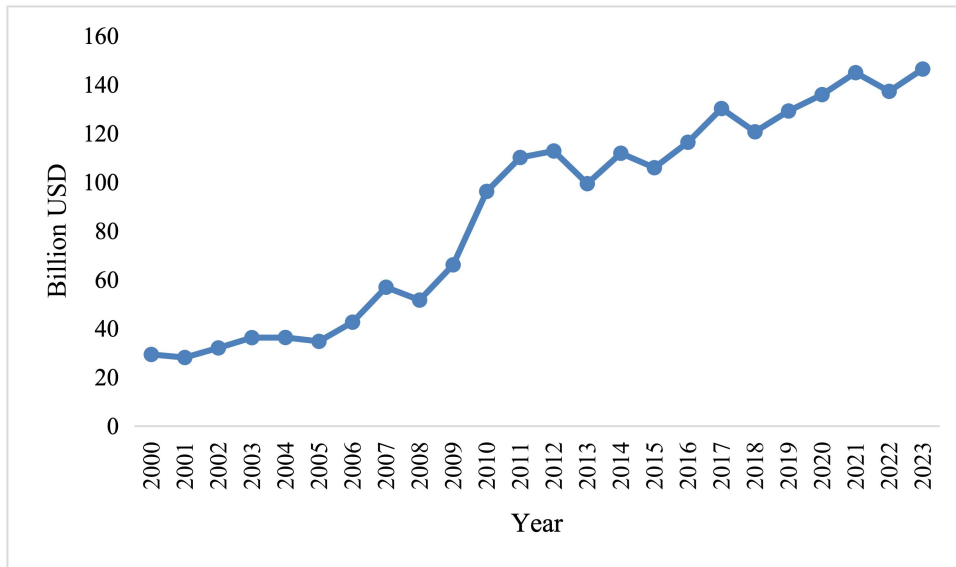
1. Introduction

The level of foreign exchange reserves is a crucial measure of a country's economic fundamentals, indicating its strength and weaknesses. Furthermore, adequate foreign exchange reserves play a vital role in ensuring a country's monetary and macroeconomic stability. Foreign exchange reserves function to protect the country from currency crisis, state spending, pay foreign debt, store foreign currency, and for other needs. The value of foreign exchange reserves is defined as funds to fulfill obligations to foreign countries, based on its function (Rachbini, 2001).

In fulfilling financing obligations to foreign countries, such as imports financing and debts financing to foreign parties, it is necessary to use foreign exchange reserves. The government continues to strive to expand international economic activities, especially investment activities, withdrawal of foreign debt and international trade through increasing economic diplomacy. One of the countries that has always

involved the important role in international economic activities for development and the economy is Indonesia.

Indonesia is a developing country, where the government has implemented various development initiatives across all sectors to enhance the well-being of its citizens. Foreign exchange reserves play a crucial role as a primary source of funding for national development in Indonesia. Capital flow, determined by import and export trade as well as foreign aid, investment, and trade activities, greatly influences the size of a country's foreign exchange reserves. By maximizing efforts to increase activities in providing capital flows to the country, foreign exchange reserves can be increased.



Source: Central Bureau Statistics, 2024

Figure 1. Foreign Exchange Reserves in Indonesia

According to Figure 1, it is evident that the foreign exchange reserves in 2000-2023 depicted different trends and tended to increase. According to Nopirin (2018), Indonesia foreign exchange reserves are relatively small, which leads Indonesia to be unable to make international payments and stabilize the exchange rate, which results in a balance of payments deficit and a plummeting rupiah exchange rate. This has led to a balance of payments deficit and a sharp decline in the rupiah exchange rate. The majority of Indonesia's foreign exchange reserves are derived from current transactions. Acquisition from this transaction are the safest when compared to acquisition through capital transactions which are hot money. Indonesia's foreign exchange reserves mainly consist of foreign currency reserves. The Indonesian government prefers to use bonds as a way to bolster its foreign exchange reserves.

Foreign exchange reserves are obtained through trade on an international scale, this is because countries need each other to meet the needs of goods within a country. For example, a country that experiences scarcity and payments in the production of a commodity, the country carries out import trade with other countries, and countries that have excess goods will export these goods to other countries (Juniantara and Budhi, 2012). National savings can be likened to foreign exchange reserves. Foreign exchange reserves serve the purpose of holding currency for

transactions and need to be monitored closely. As the savings function, the reserve amount can be increased or decreased from time to time as needed.

2. Literature Review

Robert Mundell and John Fleming created the macroeconomic model called the Mundell-Fleming model to address specific issues. This model is described as a framework for analyzing monetary and fiscal policy in an open economy. In conducting monetary and fiscal policies, policy makers need to observe its implementation outside their country. It intends to consider each country's development of international flows of goods and capital (Mankiw, 2007). The model of Mundell–Fleming represents an IS-LM framework tailored for analyzing small open economies. A key assumption of the Mundell Fleming model is the perfect mobility of capital, which characterizes the economy under study as a small open economy.

A small open economy is defined as a segment of the global economy that lacks significant influence over world interest rates. Under the assumption of perfect capital mobility, the interest rate (r) in such an economy must align with the prevailing world interest rate. This condition allows the economy unrestricted access to international financial markets, enabling it to borrow or lend freely. Consequently, the domestic interest rate is driven by global economic conditions ($r = r^*$) (Mankiw, 2007).

The amount of foreign currency that owned by both the government and the private sector called foreign exchange reserves. These reserves are typically reflected in the balance of payments, representing the inflows and outflows of foreign funds. Increased foreign exchange usage enhances a country's ability to engage in international trade and finance. Investments represent wealth and resources within a nation that are internationally recognized and can serve as legal instruments for global trade or as forms of compensation. As an instrument of global trade, a country's financial reserves are an important indicator of that country's global trade with other countries. Natural resources serve as the primary source of foreign investment and are exported to international markets. Foreign exchange reserves are categorized into two distinct parts based on their governance and volume. Firstly, the central bank manages and regulates the state's foreign exchange reserves, as stipulated by Law no. 13 of 1968. Secondly, organizational foreign exchange reserves encompass holdings maintained by entities such as individuals, institutions, and national financial organizations within the monetary sector (Ekananda, 2015).

The balance sheet reflects changes in foreign exchange reserves. An increase in foreign exchange reserves is indicated by a negative sign (-), while a decrease in foreign exchange reserves is indicated by a positive sign (+) (Suseno, 2001).

3. Research Methodology

This research utilizes secondary data, which is essentially processed and presented primary data by either the original data collectors or by other entities, often in formats such as tables or diagrams (Umar, 2013). The research comprises six variables, including five independent variables: the exchange rate, Gross Domestic Product (GDP), inflation, interest rate and state budget deficit. The dependent variable in this study is foreign exchange reserves. The data employed in this research is time series data, which refers to data that are collected, recorded, or observed sequentially over a period.

This research employs secondary data, and consequently, the data analysis technique is based on statistical methods. To ascertain the relationship and influence of multiple independent variables on a single dependent variable, it is used multiple linear regression (Ghozali, 2018). This relationship is generally expressed by the following equation:

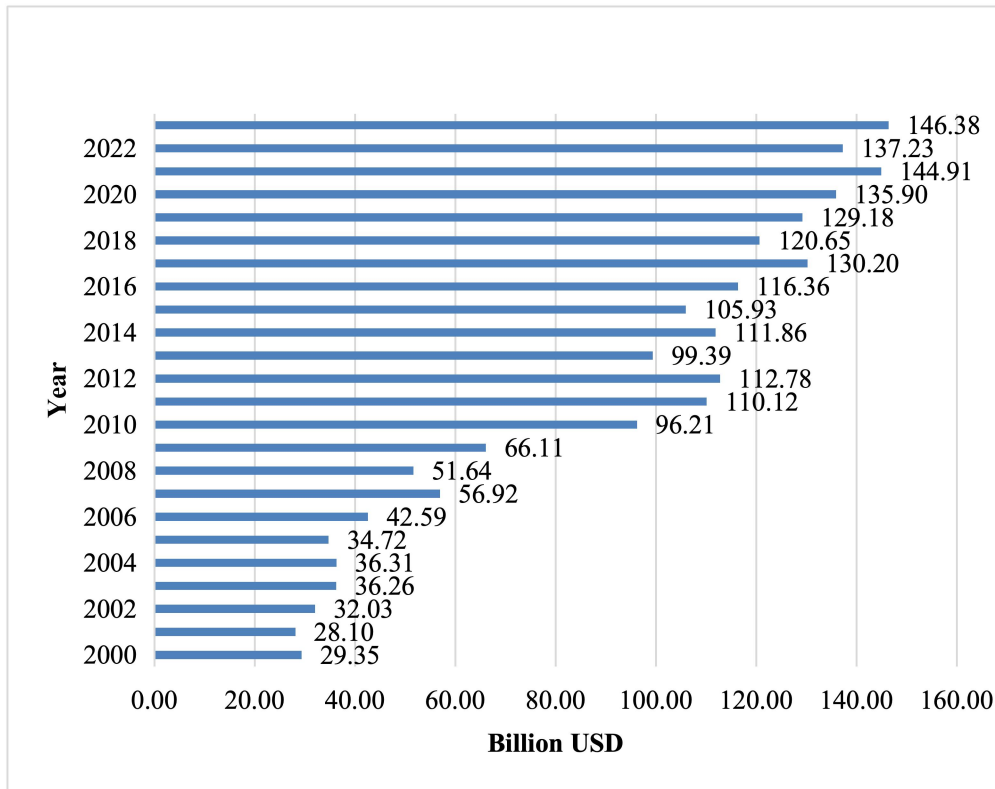
$$Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + e$$

Where:

- Y = Foreign Exchange Reserves
- α = Constant
- X_1 = Exchange Rate
- X_2 = GDP
- X_3 = Inflation
- X_4 = Interest Rate
- X_5 = State Budget Deficit
- $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = Independent Variable Coefficient
- e = Error Term
- t = Period Time of Year

4. Results

Foreign exchange reserves in Indonesia for the year 2000–2023 show fluctuating trend which reflects Indonesia’s dynamic economic development. The Central Bureau of Statistics calculates foreign exchange reserves with the following components are included; Monetary Gold, Special Drawing Rights (SDRs), Other Reserves Assets, Reserve Position in Funds (RPF), Foreign Currency and Other Bills.



Source: Statistics Indonesia, 2024

Figure 2. Foreign Exchange Reserves in Indonesia (2000-2023)

Based on Figure 2, it shows that the trend of foreign exchange reserves in Indonesia tended to increase. Despite fluctuations, the level of foreign exchange reserves consistently remains above international adequacy standards, thereby supporting macroeconomic and financial system stability. The low value of foreign exchange reserves in Indonesia for the year 2000 can be attributed to the global economic downturn, including the Asian financial crisis of 1997-1998, which necessitated a period of economic recovery for the government. Similarly, the global financial crisis of 2008 further impacted the reserves. The year 2013 was marked by significant changes and challenges for the Indonesian economy. Amidst various unresolved structural issues, shifts in global economic conditions during 2013 threatened macroeconomic stability and sustainable economic growth. In response, the policy mix implemented by Bank Indonesia and the Government successfully fostered a more balanced economic trajectory and restored macroeconomic stability. This study aims to ascertain the affecting of the exchange rates, GDP, inflation, interest rates and state budget deficit on foreign exchange reserves.

The analysis method used in this research is the Ordinary Least Squares (OLS) method. The OLS method is used to analyze the effect of the exchange rate, GDP, inflation, interest rates and state budget deficit on foreign exchange reserves in Indonesia.

Table 1. Ordinary Least Squares (OLS) Estimation Results

Variable	Coefficient	t-Statistic	Prob.
C	-1182.309	-8.266583	0.0000
ER	0.003336	2.488618	0.0228
Log_GDP	45.55784	8.304308	0.0000
INF	-0.954832	-1.132072	0.2725
IR	0.349917	0.595597	0.5589

SBD	-4.764237	-0.873259	0.3940
R-squared	0.957320		
Adjusted R-squared	0.945464		
F-statistic	80.74766		
Prob (F-statistic)	0.000000		
Durbin-Watson stat	1.169475		

Source: Data Processed by E-Views 13, 2024

Based on the results of multiple linear regression estimates or Ordinary Least Squares (OLS) in Table 1, the following equation model can be formulated:

$$\text{FER} = -1182.309 + 0.003336 \text{ ER} + 45.55784 \text{ Log(GDP)} - 0.954832 \text{ INF} + 0.349917 \text{ IR} - 4.764237 \text{ SBD}$$

The interpretation of the above equation is as follows: 1. The constant value is negative at 1182.309 with probability value is 0.0000 which is less than $\alpha = 0.05$. This means that if the independent variables (exchange rate, GDP, inflation, interest rate and state budget deficit) are constant, so the value of foreign exchange rate is -1182.309. 2. The value exchange rate variable is 0.003336, indicating that the value is positive with probability value is 0.0228 which is less than $\alpha = 0.05$. This means exchange rate variable has a significant effect on foreign exchange reserves. Therefore, every 1 unit increase in interest rate, foreign exchange reserves will increase by 0.003336 and vice versa. 3. The value of GDP variable is 45.55784, indicating that the value is positive with probability value is 0.0000 which is less than $\alpha = 0.05$. This means GDP variable has a significant effect on foreign exchange reserves. Therefore, every 1 unit increase in GDP, foreign exchange reserves will increase by 45.55784 and vice versa. 4. The value of inflation variable is -0.954832, indicating that the value is negative with probability value is 0.2752 which is more than $\alpha = 0.05$. This means inflation variable has no significant effect on foreign exchange reserves. Therefore, every 1 unit increase in inflation, foreign exchange reserves will decrease by 0.954832 and vice versa.

5. Discussion

The regression coefficient value of exchange rate for the time series data is 0.003336. The analysis concludes that the exchange rate variable has a significantly positive effect on foreign exchange reserves in Indonesia. This finding aligns with the hypothesis proposed by the researcher. It means that when the exchange rate rises, foreign exchange reserves also increase. This relationship can be explained by the fact that a higher exchange rate indicates a stronger local currency, such as the IDR, which enhances the country's capacity to support export activities and maintain monetary stability. This finding is consistent with research conducted by Ridho (2015) which also demonstrated that the exchange rate has a positive and significant effect on foreign exchange reserves. Similarly, the study aligns with Kuswantoro (2017) observations, which indicated that a stronger rupiah, along with economic stabilization and growing investor interest, leads to an increase in foreign exchange reserves as the surplus grow.

The regression coefficient value of GDP for the time series data is 45.55784. The analysis concludes that the GDP variable has a significantly positive effect on foreign exchange reserves in Indonesia. This finding aligns with the hypothesis proposed by the researcher. This implies that when GDP rises, foreign exchange reserves also increase. This relationship can be explained

by the fact that a high GDP signifies a robust economy, which enhances the country's ability to support export activities and maintain monetary stability. The results of this research align with the findings of Dianita S. and Zuhroh (2018) who concluded that gross domestic product (GDP) has a significant and positive effect on foreign exchange reserves, particularly through the increase in both domestic and foreign investment. The previous research from Heriyatma et al (2022) also finds GDP has a significant positive effect on Indonesia's foreign exchange reserves in 2017-2020.

The regression coefficient value of inflation for the time series data is -0.954832. The analysis concludes that the inflation variable has an insignificant effect on foreign exchange reserves. These findings differ from the hypothesis in this study and from the research conducted by Eulia et al. (2021), which asserts that the inflation variable has a negative and significant effect on foreign exchange reserves. When inflation rises, there is often a corresponding decline in foreign exchange reserves. This relationship can be attributed to the fact that higher inflation typically leads to increased prices for goods and services. As a result, there is a greater demand for imports, which can strain a country's foreign exchange reserves. Additionally, elevated inflation can hinder the nation's ability to support export activities, further contributing to the depletion of these reserves. Despite these differences, the results of this study are consistent with research conducted by Andriyani et al. (2020) who stated that inflation has no significance impact on foreign exchange reserves. The insignificance of inflation's impact on foreign exchange reserves is attributed to the tendency of rising prices for goods and services, which can hinder economic activity in the affected country. As a result, the country requires more foreign exchange to facilitate international transactions. Also Putra and Indrajaya (2013) finds that the inflation rate has no partial effect on Indonesia's foreign exchange reserves for the covering period 1996-2011.

The regression coefficient value of interest rate for the time series data is 0.349917. The analysis concludes that the interest rate variable has an insignificant influence on foreign exchange reserves. These findings differ from the hypothesis in this study and from the research conducted by Ratnaningtyas and Huda (2024) who stated that interest rate has a significant and negative effect on foreign exchange reserves. It means when interest rates rise, foreign exchange reserves often decline. When interest rates are high, investment values tend to decline, leading to a reduction in domestic consumption. This decrease in consumption can cause a drop in production, which in turn lowers the value of exports. Ultimately, these factors contribute to a decrease in foreign exchange reserves. The results of this research align with the findings of Kurihara (2016) who stated that interest rates have no significant effect on foreign exchange reserves in emerging and developing Asian economies. Also findings of Suwarno et al (2021) that interest rates do not have a significant effect on Indonesia's foreign exchange reserves.

The regression coefficient value of state budget deficit for the time series data is -4.764237. The analysis concludes that the state budget deficit variable has an insignificant effect on foreign exchange reserves. These findings differ from the hypothesis in this study. However, the results of this research align with the findings of Fahlepi and Syaparuddin (2019) which stated that budget deficit have a positive and significant effect on foreign debt. It means indirectly when government facing state budget deficit, it will be covered by foreign debt. Therefore, foreign debt will be increased. Which in time, the country must use its foreign exchange reserves to repay foreign debt. As a result, the country's foreign exchange reserves gradually decrease.

6. Conclusion

Based on the results of the analysis and discussion of the exchange rate, GDP, inflation, interest rate, and state budget deficit on foreign exchange reserves in Indonesia it can be concluded as follows: 1. Variables of exchange rate and GDP partially have a positive and significant effect on foreign exchange reserves. In contrast, the variables inflation, interest rates and state budget deficit partially do not have a significant effect on foreign exchange reserves. 2. Variables of exchange rate, GDP, inflation, interest rate and state budget deficit simultaneously have a significant effect on foreign exchange reserves.

According to the results, variables of exchange rate and GDP have a positive effect on foreign exchange reserves. Based on this research, to increase foreign exchange reserves, the government could pursue several key strategies. Primarily, the government and the Central Bank must maintain its exchange rate in order to keep the currency's value stable. This can be accomplished by selling or buying foreign currency to avoid speculation which could deplete foreign exchange reserves. This method can help boost the country's foreign exchange reserves and expand its ability to execute international operations. Additionally, offering export incentives such as subsidies and technological support, along with advancing economic development through increased investment, productivity improvements, and infrastructure development, is crucial for raising GDP and production capabilities. Effective management of debt and prudent budgetary savings can also diminish reliance on foreign debt.

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