Research Article

Analysis of Factors Affecting Exchange Rate Fluctuations in Indonesia

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Abstract: This research focuses on exchange rate fluctuations in Indonesia during the period of 2005 to 2023, influenced by various economic factors, primarily monetary policy and international trade dynamics. Exchange rate instability is a major concern because it can impact the national economy, including export competitiveness and macroeconomic stability. Consequently, the purpose of this research is to dissect the relationship between interest rates, export values, and wide money as it pertains to currency swings. This study takes a quantitative approach by analyzing the relationship between the dependent and independent variables via multiple linear regression. World Bank, International Monetary Fund, and Statistics Indonesia yearly time series data from 2005 to 2023 is used. The findings show that broad money, interest rates, and export values significantly impact the swings in the Indonesian currency. According to the findings of the multiple linear regression analysis, Interest rates and broad money have a positive and statistically significant effect on changes in exchange rates, but export values have a negative and statistically significant effect. The implications of this research emphasize the importance of appropriate interest rate policies and balanced broad money management to maintain exchange rate stability. Future researchers are advised to include global variables and more complex analysis methods.

Keywords: Exchange Rate Fluctuations; Monetary Policy; Interest Rates; Export Value, Broad Money

1. Introduction

Indonesia must fortify its economic factors in an open economy to keep up with the fast-paced global economy that is being propelled by technology breakthroughs. [1]. One important indicator in an open economy is the exchange rate, which plays a central role in international trade [2]. Exchange rate stability is the main goal of every country, but in practice, the exchange rate often fluctuates due to the influence of domestic economic policies and the economic conditions of trading partners [3]. Exchange rate fluctuations are caused by the mechanism of supply and demand for foreign currencies, which determines the value of the domestic currency against foreign currencies [4].

In an open economy, exchange rate fluctuations are dynamic and difficult to predict because they are influenced by various factors, including monetary policy and market expectations regarding a country's economic conditions [5], [6]. A nation's ability to compete on the international stage is highly dependent on the exchange rate. A depreciation of the exchange rate can enhance export competitiveness, while an appreciation can reduce the competitiveness of domestic goods in international markets [7]. Therefore, the exchange rate becomes a critical issue in international economics as it affects a country's trade balance and economic stability [8].

Since August 14, 1997, Indonesia has implemented a floating exchange rate system, where the exchange rate is determined by market mechanisms based on supply and demand

[1]. This approach often shows that changes in the exchange rate are accompanied by shifts in interest rates, export values, and the broad money.   Interest rates govern international capital flows and the allure of foreign investment, both of which impact the value of the rupiah compared to other currencies [9]. An increase in interest rates can boost demand for the rupiah, while a decrease can weaken its exchange rate [10], [11]. On the other hand, export values also influence the exchange rate because an increase in exports can enhance foreign exchange earnings and demand for the domestic currency, leading to an appreciation of the exchange rate [12]. However, an imbalance between rising export values and imports can create trade imbalances in international trade [13].

In addition, the broad money is a fundamental factor that can influence a country's exchange rate. An increase in the broad money tends to weaken the exchange rate, while a decrease in the broad money can encourage domestic currency appreciation [14]. Money market specialists warn that unfettered growth of the broad money supply might lead to inflation and a steady rupiah exchange rate against the US dollar [15], [16].

Previous research has examined various factors affecting the exchange rate. A study by Frido Evindey Manihuruk et al. (2023) showed that exports have a negative and significant impact on the Rupiah exchange rate, while the broad money has a positive and significant effect [15]. Interest rates significantly impact the exchange rate, whereas wide money has no such impact, according to studies conducted by Rizkina Fauzia Ansar et al (2024) [11]. The value of imports and exports affects the exchange rate in the near term, but inflation affects it in the long run, according to another research by Novia Tri Utami (2023) [17]. According to the findings of these research, the interplay between interest rates, export values, and the general money supply and its effect on currency exchange rate swings is intricate and country-specific.

This research intends to use this backdrop to examine the impact of interest rates, export values, and the broad money on the oscillations of the Indonesian exchange rate. The goal of this study is to help policymakers create more stable economic policies by identifying the elements that impact exchange rates, namely the rupiah exchange rate.

2. Literature Review

2.1. Exchange Rate

To reflect the agreed-upon price in international trade transactions, the value of one country's currency relative to another's currency is represented by the exchange rate. Exchange rates can fluctuate, appreciating when a currency strengthens and depreciating when it weakens. There are three main exchange rate systems: fixed, freely floating, and managed floating [18]. Gustav Cassel proposed the Purchasing Power Parity (PPP) hypothesis in 1918, which states that currency exchange rates ought to reflect the disparities in price levels between two nations. Both the absolute and relative versions of this theory contend that the relationship between two nation's exchange rates is directly proportionate to their relative prices. The relative version, on the other hand, stresses that exchange rate fluctuations are a direct result of the ratio of relative price changes over time. [19]. In addition, according to buying power parity theory, the value of a currency in the domestic market determines how much it can be bought with that currency. Inflation may make the value of a currency weaker, while a gain in purchasing power can make it stronger. Thus, this theory becomes an important tool in understanding the relationship between domestic and international economic conditions in determining currency exchange rates [20].

2.2. Interest Rate

Bank Indonesia announces the interest rate, which is also called the BI Rate, on a monthly basis. It is a monetary policy stance signal and is good for one month. An effective interest rate is what Bank Indonesia has decided upon as its interest rate. The BI rate is a reference in monetary operations, influencing Bank Indonesia certificate interest rates, and serves as the basis for calculating credit services by financial institutions [21]. The interest rate parity theory, first explained by John Maynard Keynes (1930) and further developed in international economics, states that interest rates affect exchange rates through money and

foreign exchange markets, where high interest rates attract investment and cause currency appreciation, while low interest rates tend to weaken the currency as investors seek higher returns in other countries [20].

2.3. Export Value

Export is the activity of selling products abroad based on an agreement between the exporter and importer regarding payment, quality, quantity, and other terms [15]. The main indicator in assessing the value of exports is the average annual growth or its long-term trend, where good exports show higher growth compared to competitor countries [22]. High export values increase demand for the Rupiah, strengthen the exchange rate, and reduce unemployment through increased job creation, which then drives increased income and public purchasing power [13].

2.4. Broad Money

Broad money, or M2, is defined by Bank Indonesia as M1 (public funds and demand deposits), plus quasi-money and domestic private sector instruments issued by the monetary system with maturities of up to one year [19]. According to Irving Fisher's classical quantity theory of money, which he put forward in the early 20th century, an increase in the money supply without a commensurate rise in production can cause inflation and a depreciation of the local currency [23].

3. Methodology

This research employs a quantitative method with descriptive and analytical approaches. The population under study encompasses exchange rate, interest rate, export value, and broad money data in Indonesia, while the sample consists of annual data from 2005 to 2023. In this research, the exchange rate is the dependent variable, while the interest rate, export value, and broad money are the independent variables. Secondary data for 2025 came from the World Bank, the International Monetary Fund, and the Central Bureau of Statistics of Indonesia. Ordinary Least Squares multivariate linear regression was used to do the study [24], [25], which is known as the *Best Linear Unbiased Estimator* (BLUE).

Equation (1) below is used to accurately and efficiently measure the influence of independent variables on the dependent variable, as well as to support decision-making and policy formulation related to exchange rate fluctuations. The equation model used in this research is:

$$ER_t = \beta_0 + \beta_1 IR_{1t} + \beta_2 EV_{2t} + \beta_3 BM_{3t} + e_t \tag{1}$$

Description:

ER	= Exchange Rate (IDR to USD)
β_0	= constant
$\beta_1 \beta_2 \beta_3$	= regression coefficient of the independent variable
IR	= Interest Rate (%)
EV	= Export Value (Million USD)
BM	= Broad Money (Billion IDR)
t	= time series
e	= error term

4. Results

To verify that the model employed satisfies the stated assumptions, it is necessary to conduct many tests when verifying classical assumptions in linear regression. The multicollinearity test is one of the procedures used to check for correlations between the regression model's independent variables. By examining the values of the *Variance Inflation Factor* (VIF) and the *Tolerance*, we may ascertain if multicollinearity is present or not.

Assumption of multicollinearity is satisfied when VIF is less than 10. The interest rate, export value, and wide money variables all have VIF values below 10, as shown in Table 1 below. Therefore, multicollinearity is not present.

Table 1. Multicollinearity and Autocorrelation Test Result

Variable	VIF
Interest Rate	2.496716
Export Value	3.426711
Broad Money	5.661712
Prob. Chi-Square (2)	**0.07**

Source: Processed data results from Eviews 10

Classical assumption testing encompasses not only the multicollinearity test but also the autocorrelation test, which seeks to ascertain, given a linear regression model, if the disturbance errors at time t and the disturbance errors at time t-1 are related. It is common for time series data to exhibit autocorrelation. If a model does not have any autocorrelation problems, it is excellent. Based on Table 1 above, it shows that the *Prob. Chi-Square (2)* value is greater than α (5%), which is 0.07 > 0.05. Therefore, it can be stated that the model does not experience autocorrelation problems.

The analysis in this study uses multiple linear regression analysis to identify the factors influencing exchange rate fluctuations in Indonesia. The data used to determine the model is time series data for the period from 2005 to 2023.

Table 2. Estimation Result of the Analysis of Factors Affecting Exchange Rate Fluctuations in Indonesia

Independent Variable	ES	β	Stand. Error	t-statistic	t-table	Prob.
Interest Rate	+	0.1578**	0.6195	2.467	2.13	0.02
Export Value	+/-	-0.466***	0.0639	-6.545	2.13	0.00
Broad Money	+/-	0.5625***	0.0467	12.032	2.13	0.00
constant						6.181015
Adjusted R-squared						0.9403
F-statistic						95.614
F-table						3.29
Prob. F-statistic						0.00
Prob-Chi Square (2)						0.07
n						19

Source: Processed data results from Eviews 10

***= Significant at the 1% error level (0.01), or 99% confidence level

** = Significant at the 5% error level (0.05), or 95% confidence level

ES = Expectation Sign

Based on the estimation results in Table 2, the multiple linear regression equation can be written as follows:

$$ER_t = 6.181015 + 0.1578IR_t - 0.466EV_t + 0.5625BM_t + e_t \qquad (2)$$

1) The derived constant value of 6.181015 indicates that the dependent variable will likewise grow by 6.181015 IDR to USD if the independent variable increases by 1 IDR to USD on average.

2) With a positive regression coefficient value of 0.1578 for the interest rate variable, we can see that for every 1% rise in the interest rate variable, there is an average 0.1578 percent increase in the exchange rate variable.

3) A negative regression coefficient of -0.466 for the export value variable indicates that for every 1 million USD rise in the export value variable, the average reduction in the exchange rate variable is 0.466 million USD.

4) If the broad money variable grows by 1 billion IDR, the exchange rate variable will increase by an average of 0.5625 billion IDR, according to the positive regression coefficient value of 0.5625 for the broad money variable.

Hypothesis testing makes use of a variety of methods for investigating the effect of regression model's independent variables on the dependent variable. One technique used is the F-test, which aims to show if all the independent variables in the model have an effect on the dependent variable simultaneously. If the calculated F-statistic is greater than the F-table value, we may reject H0 and accept H1; this indicates that the independent variables have an effect on the dependent variable. The estimated F-statistic, 95.614, is more than the F-table value of 3.29; the probability value of the F-statistic, 0.00, is significant at the 1% level, and this information is supported by Table 2. We may thus infer that H1 is correct and that interest rate, export value, and broad money all have a substantial role in the Indonesian exchange rate.

Part of testing hypotheses includes doing t-tests (partial) and F-tests; the latter finds out if each independent variable has a statistically significant influence on the dependent variable. The null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted when the t-statistic is greater than the t-table value. This partly demonstrates that the dependent variable is affected by the independent variable. In Table 2 you can see the t-test results:

1) Interest Rate Variable

At a significance threshold of 0.02 < 5%, the interest rate variable's t-statistic of 2.467 is higher than the t-table value of 2.13. Thus, it is reasonable to assume that interest rates significantly impact the exchange rate.

2) Export Value Variable

At a significance threshold of 0.00 < 1%, the t-statistic of -6.545 for the export value variable is higher than the t-table value of 2.13. Hence, it is reasonable to assume that the export value variable influences the exchange rate variable to a certain extent.

3) Broad Money Variable

A t-statistic of 12.032 for the broad money variable surpasses the t-table value of 2.13 at a significance threshold of 0.00 < 1%. Thus, it is reasonable to assume that the broad money variable influences the exchange rate variable to a certain extent.

To find out how much each independent variable affected the dependent variable in a regression model, one way to look at the coefficient of determination (R^2) is as a percentage. A high R^2 value indicates exceptional independence between the dependent and independent variables. An *adjusted R-squared* value of 0.9403 is shown in Table 2. This finding suggests that interest rates, export values, and broad money all have a total impact of 94% on Indonesian exchange rate movements. Other factors not included in the research account for the remaining 6%.

5. Discussion

5.1. The Influence of Interest Rates on Exchange Rates

Interest rates are a primary factor influencing exchange rate movements. Rising interest rates tend to attract capital inflows, which can strengthen the exchange rate. Below is a figure illustrating the trend of both variables during the period from 2005 to 2023.
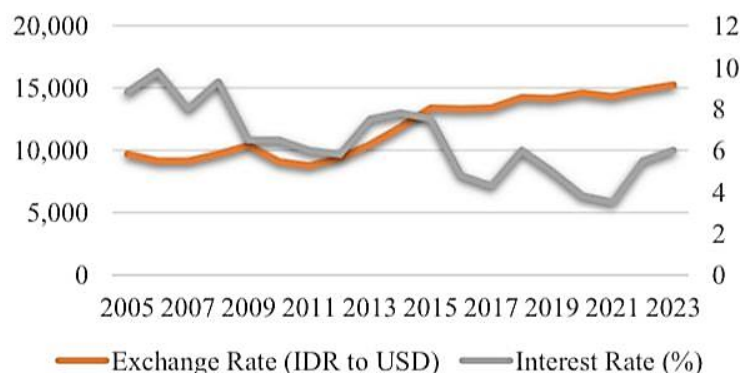

Figure 1. This is a picture of the trend in interest rates and exchange rates
Source: Data processed with Ms. Excel, 2025.

According to the study's findings, interest rates significantly and positively affect the value of the currency exchange rate. Because deposits and bonds in Indonesia are now more appealing to investors—including those from outside the country—an rise in interest rates has a multiplicative effect on the Rupiah's value relative to other currencies. As a result, the demand for Rupiah grows, money flows into the country, and the Rupiah appreciates in value relative to other currencies. This finding contradicts the findings of Ihsanul Waldi and Syamsul Amar (2020), who found no statistically significant relationship between interest rates and the Rupiah exchange rate [26]. Nevertheless, the findings of this study are consistent with those of Rizkina Fauzia Ansar et al. (2024), which found that interest rates significantly impact the exchange rate. [11]. This study's findings are in line with those of John Maynard Keynes's interest rate parity theory from 1930. Keynes's theory posits that a country's currency rate would reflect its interest rate differential as interest rate differentials affect the flow of foreign investment. To entice more foreign investment, a country's currency tends to gain when interest rates are high, and depreciate when rates are low. As seen in Figure 1, the development of the exchange rate in Indonesia from 2005 to 2023 shows quite significant fluctuations. In 2005, the exchange rate was at 9.705 IDR to USD, then experienced a decrease in 2007 before increasing again in 2009 to reach Rp10.309/USD. The exchange rate weakened again in the following two years to reach 8.770 IDR to USD in 2011. An upward trend occurred again in 2012 with an exchange rate of 9.837 IDR to USD and continued to fluctuate until reaching its peak in 2023 at 15.236 IDR to USD. The monetary policies implemented by Bank Indonesia during that period sought to maintain exchange rate stability through changes in interest rates. For example, in 2014, interest rates were raised to 7.8% to control inflation and dampen external pressures, while in 2016, interest rates were lowered to 4.8% to support economic recovery. This shows that interest rates play an important role in exchange rate movements. By raising interest rates, the attractiveness of domestic investment increases, encouraging the inflow of foreign capital, and contributing to the appreciation of the exchange rate.

5.2. The Influence of Export Values on Exchange Rates

Export values play a crucial role in influencing the movement of a country's exchange rate. A decline in exports can strengthen the exchange rate if accompanied by a more significant decrease in imports. Below is a chart illustrating the trends of these two variables from 2005 to 2023.

Figure 2. This is a picture of the trend in export value and exchange rates

Source: Data processed with Ms. Excel, 2025.

The research findings indicate that export values have a negative and significant impact on exchange rates. An increase in export values leads to depreciation (weakening) of the exchange rate. This means that when exports rise, the demand for the domestic currency (rupiah) decreases, thereby weakening the exchange rate against foreign currencies. In other words, despite an increase in export volume, its effect on the exchange rate is negative. These findings contradict the research by Eka Puspita and Lela Nurlatipah (2023), which states that an increase in exports positively affects the exchange rate [27], but align with the studies by Frido Evindey Manihuruk et al. (2023) and Novia Tri Utami (2023), which assert that export values negatively and significantly influence exchange rates [15], [17]. As illustrated in Figure 2, the development of exchange rates in Indonesia from 2005 to 2023 shows significant fluctuations. In 2005, the exchange rate was at 9.705 IDR to USD, then declined in 2007 before rising again in 2009 to reach 10.309 IDR to USD. The exchange rate weakened again in the following two years, reaching 8.770 IDR to USD in 2011. A rising trend occurred again in 2012 with an exchange rate of 9.837 IDR to USD and continued to fluctuate until peaking in 2023 at 15.236 IDR to USD. Meanwhile, export values experienced significant fluctuations, with Indonesia's export value reaching 291.904 million USD in 2022, higher than the average export value during the 2005-2023 period of 169.889 million USD. Typically, an increase in export value results in a foreign exchange surplus that should strengthen the domestic currency. However, if this surplus is primarily used for overseas investment or does not directly increase demand for the rupiah domestically, the exchange rate may depreciate. This situation often occurs in developing countries like Indonesia. Additionally, global economic instability conditions, such as the global financial crisis of 2008 and the Covid-19 pandemic of 2020, have also influenced market sentiment toward domestic currencies. In such situations, an increase in export value that should strengthen the domestic currency is instead followed by a weakening of the exchange rate due to an imbalance between capital inflows and market expectations regarding macroeconomic management.

5.3. The Influence of Broad Money on Exchange Rates

The amount of money in circulation is also one of the factors that influence the exchange rate movements of a country. An increase in the broad money can lead to depreciation of the exchange rate if it is not balanced by sustainable economic growth. Conversely, controlled growth in the broad money can help maintain exchange rate stability. Below is a graph that illustrates the trends of these two variables from 2005 to 2023.
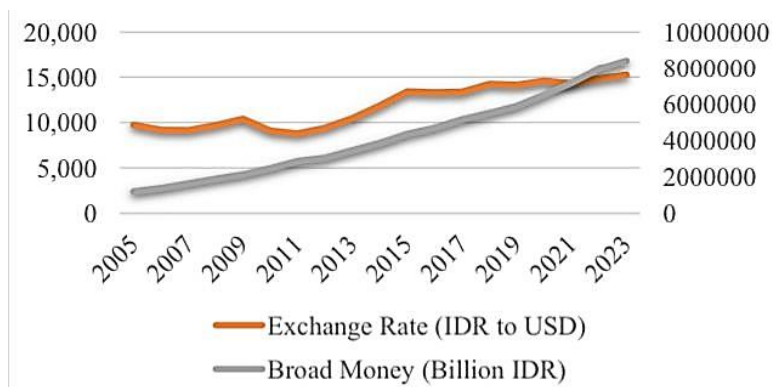
Figure 3. This is a picture of the trend in broad money and exchange rates
Source: Data processed with Ms. Excel, 2025.

The research findings indicate that the broad money has a positive and significant effect on the exchange rate. An increase in the broad money can enhance investor and consumer confidence in a country's economy, thereby encouraging more transactions and investments. With rising economic activity, the demand for domestic currency will also increase, which in turn can strengthen the exchange rate. However, it is important to note that an increase in the broad money must be balanced and not excessive, as this can lead to inflation and reduce the purchasing power of the public. These findings do not entirely align with Fisher's quantity theory of money, which suggests that an unbalanced increase in the broad money relative to economic growth will cause depreciation of the domestic currency. In this case, there is a contradiction between the research results and this theory, as the research assumes that an increase in the broad money can boost investor and consumer confidence, thus strengthening the exchange rate. Nonetheless, these findings are consistent with research by Frido Evindey Manihuruk et al. (2023), according to which M2 significantly and positively affects the rupiah-dollar exchange rate. [15]. As shown in Figure 3, the development of the exchange rate in Indonesia from 2005 to 2023 exhibits significant fluctuations. In 2005, the exchange rate was at 9.705 IDR to USD, then it declined in 2007 before rising again in 2009 to reach 10.309 IDR to USD. The exchange rate weakened again over the next two years until it reached 8.770 IDR to USD in 2011. An upward trend occurred again in 2012 with an exchange rate of Rp9.837 IDR to USD and continued to fluctuate until it peaked in 2023 at 15.236 IDR to USD. During this period, the broad money, which is one of the factors influencing exchange rate movements, also experienced significant growth. The average broad money in Indonesia during the period from 2005 to 2023 was recorded at 4.195.635 billion IDR, peaking in 2023 at 8.415.900 billion IDR. This increase was supported by credit distribution growth of 8.5%, while quasi-money and an increase in quasi-money of 9.4% reached Rp3.657,7 trillion by July 2023. This growth reflects Bank Indonesia's success in managing liquidity without causing excessive inflation; post-pandemic price stability and increased foreign investor confidence have also contributed to demand for the rupiah, ultimately strengthening the exchange rate. Thus, well-managed growth in the broad money becomes a positive factor for the stability of Indonesia's exchange rate.

6. Conclusions

There was a positive and statistically significant influence of interest rates and broad money on exchange rate swings in Indonesia, but there was a negative and statistically significant effect of export value.

This finding supports the hypothesis that monetary policy has a significant impact on exchange rates. An increase in interest rates attracts foreign investment and strengthens the rupiah, while a well-managed increase in the broad money can enhance investor confidence and bolster the exchange rate. However, an increase in export values does not always strengthen the rupiah, as a rise in exports does not directly lead to an increased demand for the domestic currency.

The implications of this research indicate that exchange rate stability can be maintained through appropriate interest rate policies and balanced management of the broad money. The government and Bank Indonesia need to ensure that export surpluses directly contribute to

increasing the demand for the rupiah in order to strengthen the exchange rate. Furthermore, a stable monetary policy can help reduce excessive exchange rate volatility.

This research has limitations, including the failure to consider external factors such as global crises and the economic policies of trading partner countries that can affect exchange rates. Therefore, future research could expand the analysis by incorporating external variables and utilizing more complex methods to gain a deeper understanding of exchange rate dynamics.

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