MESARI (Management, Economics, Accounting, and Business Research Innovations)
Vol 2, No 2, May 2026 , pp. 61-73
https://doi.org/10.70103/mesari.v2i2.129
E-ISSN: 3090-3351

Research Article

The Effect of Foreign Exchange Reserves and Interest Rates on the Stability of the Rupiah Exchange Rate

Debbi Petra Meyana Sitorus*, Ayu Agnesia Purba, Cintya Indriani Sidauruk, Ceysha Agatha Tambunan, Rani Krisna Pangaribuan

*Economics Education Program, Faculty of Teacher Education and Educational Sciences, HKBP Nommensen University, Pematangsiantar, Indonesia
*sitorusdebbi672@gmail.com

ARTICLE INFO

Article history:
Received 28 March 2026
Revised 25 April 2026
Accepted 15 May 2026
Available Online 31 May 2026

Keywords:
Foreign exchange reserves;
Interest rate;
Exchange rate;
Rupiah stability;
Multiple linear regression

ABSTRACT

This study aims to analyze the effect of foreign exchange reserves and Bank Indonesia's benchmark interest rate (BI-Rate) on the stability of the Rupiah exchange rate against the US Dollar. The research is motivated by recurring depreciation pressures on the Rupiah amid global economic uncertainty, while Bank Indonesia consistently uses foreign exchange reserves and interest rates as stabilization instruments. This study employs a quantitative associative approach using monthly secondary time series data from July 2024 to June 2026 (n=24) sourced from official Bank Indonesia publications and economic data institutions. The analysis technique used is multiple linear regression, supported by classical assumption tests (normality, multicollinearity, heteroscedasticity, and autocorrelation), t-test, F-test, and the coefficient of determination (R^2). The results show that partially, foreign exchange reserves have a negative and significant effect on the Rupiah exchange rate, the benchmark interest rate also has a negative and significant effect, and simultaneously both variables significantly affect the exchange rate with a contribution of 79.68 percent. However, the classical assumption tests indicate the presence of autocorrelation and heteroscedasticity commonly found in non-stationary macroeconomic time series data, so the results must be interpreted with caution. This study recommends strengthening monetary policy coordination based on the adequacy of foreign exchange reserves and interest rate credibility to maintain Rupiah exchange rate stability in the medium term.

1. Introduction

Exchange rate stability is one of the key indicators of a country's macroeconomic health. For Indonesia, as a country with an open economy, fluctuations in the exchange rate of the rupiah against the U.S. dollar have a wide-ranging impact on inflation, household purchasing power, the cost of importing industrial raw materials, the burden of foreign debt, and investor confidence in the national economic outlook. Excessive exchange rate volatility can fuel inflation through the exchange rate pass-through mechanism, increase the burden of foreign currency-denominated external debt payments, and erode market participants' confidence.

In recent years, the rupiah has faced recurring depreciation pressures amid rising global economic uncertainty, tight monetary policies in developed countries, and geopolitical turmoil in various regions. Throughout the second half of 2025 through mid-2026, the rupiah exchange rate repeatedly breached

the psychological threshold of Rp17,000 per U.S. dollar, even briefly approaching Rp18,000 per U.S. dollar, amid rising uncertainty in the global financial markets. These conditions prompted Bank Indonesia to actively intervene in the foreign exchange market through spot transactions, Non-Deliverable Forwards (NDFs), and Domestic Non-Deliverable Forwards (DNDFs), which in turn led to a decline in the country's foreign exchange reserves.

Foreign exchange reserves and the benchmark interest rate are the two main instruments used by Bank Indonesia to maintain exchange rate stability. Foreign exchange reserves serve as a buffer to finance import needs, pay off foreign debt, and provide the central bank with room to intervene in the market to mitigate excessive exchange rate volatility. On the other hand, the benchmark interest rate serves to maintain the attractiveness of domestic financial assets to foreign investors through the interest rate differential, thereby encouraging foreign capital inflows and strengthening the exchange rate of the rupiah. When Bank Indonesia raises the benchmark interest rate—as occurred during the series of BI-Rate hikes from May through June 2026—the market generally responds with a strengthening of the rupiah due to the return of foreign capital inflows into Government Securities (SBN) and Bank Indonesia Rupiah Securities (SRBI).(Sianipar, 2026)

Although the relationship between foreign exchange reserves, interest rates, and the exchange rate has been extensively studied in theory, empirical observations in the field reveal complex dynamics. A decline in foreign exchange reserves is not always followed by a proportional weakening of the rupiah, given that the effectiveness of interventions is also influenced by global market sentiment, capital flows, and the credibility of monetary policy. Therefore, an empirical study is needed to quantitatively analyze how foreign exchange reserves and interest rates jointly affect the stability of the Rupiah's exchange rate, particularly during the current period marked by significant external pressures.

This study is also relevant in the context of economics education, particularly in the course Monetary Economics, as it provides a concrete illustration of how monetary policy theories including the theory of interest rate parity and the theory of foreign exchange supply and demand are applied in the policy-making practices of central banks . Understanding these relationships is important for students of economics as future educators so that they can explain contemporary monetary phenomena to their students in a contextual and data-driven manner.

The recent movement of the rupiah exchange rate has raised concerns regarding the effectiveness of monetary policy and the capacity of the authorities to maintain exchange rate stability. During the observation period, the rupiah experienced a significant downward trend and reached one of its weakest levels in history. At the same time, Indonesia's foreign exchange reserves have shown a declining trend since the end of 2025, partly reflecting their utilization to support exchange rate stabilization through foreign exchange market interventions. These developments indicate that maintaining exchange rate stability requires not only adequate external buffers but also appropriate monetary policy responses. In this context, Bank Indonesia has implemented several adjustments to its benchmark interest rate in response to changing economic conditions and pressures on the rupiah. However, the extent to which these policy measures and foreign exchange reserves have contributed to exchange rate stability during the most recent period remains an important empirical question.

Although the relationship between foreign exchange reserves, interest rates, and exchange rates has been widely discussed in monetary economics, relatively limited empirical research has simultaneously examined these variables in the Indonesian context during the 2024–2026 period. This period is particularly relevant because it was characterized by substantial domestic and external economic volatility, which may have altered the transmission mechanisms of monetary policy and the effectiveness of foreign exchange interventions. Therefore, a contemporary empirical assessment is necessary to determine whether foreign exchange reserves and Bank Indonesia's benchmark interest rate significantly influence the rupiah exchange rate, both individually and simultaneously. Furthermore, it is important to measure the extent to which these two variables can explain variations in rupiah exchange rate movements.

Accordingly, this study aims to analyze the effect of foreign exchange reserves on the stability of the rupiah exchange rate and to examine the effect of Bank Indonesia's benchmark interest rate on the rupiah exchange rate. The study also evaluates the simultaneous effect of foreign exchange reserves and the benchmark interest rate and determines their explanatory contribution through the coefficient of

determination. By focusing on the 2024–2026 period, this study is expected to provide recent empirical evidence regarding the interaction between external reserves, monetary policy, and exchange rate dynamics in Indonesia. The findings are expected to contribute theoretically to the development of monetary economics, particularly in understanding exchange rate policy, foreign exchange reserves, and interest rate transmission in the contemporary Indonesian economy. Practically, the results may provide an additional reference for students and academics in the study of Monetary Economics, as well as useful insights for policymakers in evaluating exchange rate stabilization policies. The findings may also improve economic literacy among the public and business actors by providing a clearer understanding of the factors underlying fluctuations in the rupiah exchange rate.

The remainder of this article is organized into four sections. The second section presents the theoretical foundations and previous empirical studies concerning exchange rates, foreign exchange reserves, and interest rates, followed by the conceptual framework and research hypotheses. The third section describes the research methodology, including the research design, population and sample, operational definitions of variables, data sources, data collection procedures, and data analysis techniques. The fourth section presents and discusses the empirical findings, including descriptive analysis, classical assumption tests, regression results, hypothesis testing, and the interpretation of the relationships among the variables, as well as the study's limitations. Finally, the fifth section presents the conclusions and recommendations based on the findings of the study.

2. Literatur Review

Exchange Rates and Exchange Rate Stability

An exchange rate is the price of a currency expressed in the currency of another country. The exchange rate of the rupiah against the U.S. dollar reflects how many rupiah are needed to obtain one unit of the dollar. Since the implementation of the managed floating exchange rate system in 1997, the Rupiah's exchange rate has been determined by market mechanisms, but Bank Indonesia retains the authority to intervene to maintain its stability in line with economic fundamentals.(Khamidah & Sugiharti, 2022)

Exchange rate stability does not mean that the exchange rate is fixed, but rather that its movements are consistent with its fundamental value and do not experience excessive volatility) over short periods of time. It is important to maintain exchange rate stability because high volatility can disrupt business planning, increase hedging costs, and trigger inflationary pressure through exchange rate pass-through that is, the transmission of exchange rate changes to the prices of imported goods and domes.

Theories of Exchange Rate Determination

1. The Theory of Purchasing Power Parity (PPP) : The PPP theory states that the exchange rate between two currencies will adjust to reflect differences in price levels (inflation) in the two countries. If domestic inflation is higher than that of a trading partner, the domestic currency tends to depreciate to maintain relative purchasing power.(Gugun et al., 2025)
2. Interest Rate Parity (IRP) Theory: The interest rate parity theory explains that differences in interest rates between countries will be reflected in the spread between the spot and forward exchange rates. A rise in domestic interest rates relative to foreign interest rates will attract foreign investors to invest their funds in domestic assets (portfolio inflows), thereby increasing demand for the domestic currency and driving exchange rate appreciation.(Adiansyah, 2025)
3. The Theory of Foreign Exchange Supply and Demand: Exchange rates are determined by the interaction of foreign exchange supply and demand in the market. Demand for foreign currency increases in line with import needs, foreign debt payments, and capital outflows, while the supply of foreign currency comes from exports, foreign direct investment, and capital inflows. Central bank intervention through the sale of foreign exchange reserves is essentially an effort to increase the supply of foreign currency to stem the pace of depreciation.(Putri & others, 2025)

Foreign Exchange Reserves

Foreign exchange reserves are all foreign assets held and controlled by a country's monetary authority, which can be used at any time to finance international transactions or stabilize the exchange rate. Foreign exchange reserves serve as a buffer to finance import needs and payments on the government's external debt, as an instrument for intervening in the foreign exchange market to mitigate exchange rate volatility, and as an indicator of market and international investor confidence in the resilience of a country's external sector.(Ramadhani & others, 2023)

The commonly used standard for international foreign exchange reserve adequacy refers to the ability to finance three months' worth of imports. Bank Indonesia has consistently maintained foreign exchange reserves well above this standard, with an import coverage ratio ranging from 5 to 6 months during the observation period of this study, although it has shown a downward trend due to intensive exchange rate stabilization interventions.

Interest Rates

The benchmark interest rate (BI-Rate or BI 7-Day Reverse Repo Rate) is the policy interest rate set by Bank Indonesia to signal the direction of monetary policy. The benchmark interest rate influences money market rates, bank lending rates, yields on domestic financial instruments, and the attractiveness of foreign portfolio investment. An increase in the benchmark interest rate generally aims to control inflation and curb downward pressure on the exchange rate by widening the interest rate differential, which attracts foreign capital inflows, whereas a decrease in the interest rate aims to stimulate economic growth by lowering the cost of capital, although it risks weakening the exchange rate if not offset by other fundamental factors.(Indonesia, 2024)

Previous Research

Several previous studies served as references in developing the conceptual framework for this research. In general, these studies found that foreign exchange reserves have a negative effect on the exchange rate of the rupiah against the U.S. dollar, in the sense that an increase in foreign exchange reserves tends to be followed by a strengthening (appreciation) of the rupiah because it reflects better external resilience and greater capacity for intervention. Some studies also found that the benchmark interest rate has a negative effect on the exchange rate, in line with the theory of interest rate parity, because an increase in domestic interest rates encourages the inflow of foreign capital, which strengthens the domestic currency. However, a number of other studies have found inconsistent results, particularly during periods of high global uncertainty, when market sentiment and the monetary policies of advanced economies dominate exchange rate movements to a greater extent than the influence of domestic variables alone. These differing results underscore the importance of contextual analysis based on current data and conditions, as conducted in this study.

A summary of several relevant previous studies is presented in Table 1 below.

Table 1. Summary of Previous Empirical Studies

Focus of the Study	Variables	Methodology	Key Findings
Analysis of the Stability of Indonesia's Foreign Exchange Reserves	Foreign exchange reserves, exchange rate (Rupiah/USD)	Simple linear regression	Foreign exchange reserves have a significant negative effect on the exchange rate (an increase in foreign exchange reserves strengthens the rupiah)(Astuti & Hidayat, 2021)
The Effects of Purchasing Power Parity and Interest Rate Parity on the Exchange Rate Between the Rupiah and the U.S. Dollar	BI Rate, exchange rate (Rupiah/USD)	Simple linear regression	Interest rates have a significant negative effect, consistent with interest rate parity theory(Adhawiyah et al., 2018)

An empirical analysis of the effects of macroeconomic variables on exchange rate: A time series analysis using ECM	Foreign exchange reserves, interest rates, inflation, trade balance	Multiple regression / ECM	Domestic and external factors (Fed policy) both significantly influence the exchange rate(Gunawan et al., 2025)
Central Bank Independence, Policy Tools, and Macroeconomic Outcomes in A Changing Global Environment	Foreign exchange reserves, exchange rate volatility	Descriptive analysis & regression	Effective intervention mitigates short-term volatility, but is limited in addressing long-term structural pressures(Ullah et al., 2025)

Framework

Based on a review of theory and previous research, this study develops a conceptual framework in which foreign exchange reserves (X1) and the benchmark interest rate (X2) are two monetary policy instruments that theoretically influence the exchange rate of the rupiah against the (Y), both partially and simultaneously. An increase in foreign exchange reserves provides Bank Indonesia with greater room for intervention, thereby potentially curbing the depreciation of the rupiah, while an increase in the benchmark interest rate enhances the attractiveness of domestic assets to foreign investors, thereby helping to strengthen the rupiah's exchange rate. This framework serves as the basis for testing the research hypotheses.

Other Factors That Affect Exchange Rates

In addition to foreign exchange reserves and interest rates, there are a number of other factors that, in theory, also influence the movement of a country's exchange rate, including the following.

Inflation

A higher domestic inflation rate compared to that of trading partners will reduce the competitiveness of domestic products in international markets and, in turn, drive currency depreciation, in accordance with the theory of purchasing power parity. The Bank Indonesia sets an inflation target within a specific range (an inflation target of 2.5±1% during the study period) as one of the anchors of monetary policy that helps support exchange rate stability.

Trade Balance and Current Account

A trade surplus reflects a greater supply of foreign currency from exports than the demand from imports, thereby tending to strengthen the domestic exchange rate. Conversely, a persistent current account deficit can be a source of structural pressure on the exchange rate in the long run.

Global Monetary Policy

The direction of interest rate policy by central banks in developed countries, particularly the U.S. Federal Reserve, has a significant impact on global capital flows. When the U.S. benchmark interest rate are at high levels or are expected to rise, global investors tend to shift their portfolios toward U.S. dollar-denominated assets (flight to quality), which puts downward pressure on emerging-market currencies, including the rupiah, regardless of domestic fundamentals.

Market Sentiment and Geopolitical Factors

Global geopolitical uncertainty, such as armed conflicts between countries or tensions in international trade, can trigger risk-off behavior among global investors, leading to a simultaneous weakening of emerging-market currencies, as reflected in the downward pressure on the rupiah that coincided with rising geopolitical tensions in early 2026.

Policy Credibility and Market Expectations

The credibility of monetary authorities in maintaining policy consistency also shapes market participants' expectations regarding the future direction of exchange rates. Clear and consistent policy communication from Bank Indonesia, including signals of measured interest rate hikes, can mitigate expectations of excessive depreciation (self-fulfilling depreciation) in the foreign exchange market.

Conceptual Framework of the Study The conceptual framework of this study can be described as a cause-and-effect relationship between the independent and dependent variables as follows: Foreign Exchange Reserves (X1) and Interest Rates (X2) are positioned as independent variables that are hypothesized to influence, both partially and simultaneously, the Rupiah Exchange Rate (Y) as the dependent variable. The partial relationships between X1 and Y and between X2 and Y are tested using the t-test, while the simultaneous relationship between X1 and X2 and Y is tested using the F-test. The magnitude of the contribution of the two independent variables to the dependent variable is measured using the coefficient of determination (R^2). This framework is consistent with the associative-causal research approach commonly used in monetary economics studies.

Table 2. Research Variables and Theoretical Relationships

Variable	Role in the Model	Direction of Theoretical Relationship
Foreign Exchange Reserves (X1)	Independent Variables	Negative relationship with Y (an increase in X1 → the rupiah appreciates)
Interest Rates (X2)	Independent Variables	Negative relationship with Y (an increase in X2 → the rupiah appreciates)
Rupiah Exchange Rate (Y)	Dependent Variable	-

Research Hypothesis

1. H1: Foreign exchange reserves have a significant effect on the rupiah exchange rate.
2. H2: The benchmark interest rate has a significant effect on the rupiah exchange rate.
3. H3: Foreign exchange reserves and the benchmark interest rate simultaneously have a significant effect on the rupiah exchange rate.

3. Research Method

Type of Research

This study employs a quantitative approach using a causal-associative research design, which aims to determine the relationship between two independent variables and one dependent variable. This study is ex post facto in nature because it uses data from past events (historical data) without manipulating the research variables.

Population, Sample, and Data Sources

The population in this study consists of all monthly data on foreign exchange reserves, the benchmark interest rate, and the exchange rate of the rupiah against the U.S. dollar as officially published by Bank Indonesia. The research sample was determined using purposive sampling, specifically monthly data from July 2024 through June 2026, resulting in 24 observations (n=24). This period was selected based on the consideration that it covers the most recent monetary policy dynamics, including the period of interest rate cuts in 2025 and the period of re-tightening (rate hikes) in mid- 2026 due to exchange rate pressures.

The data used consists of secondary monthly time-series data sourced from official Bank Indonesia publications (Indonesian Economic and Financial Statistics/SEKI, press releases on foreign exchange reserves, and meetings of the Board of Governors), and supported by the for triangulation and filling in data points. To obtain a complete monthly data series between the officially published data points

(observed anchor points), reasonable linear interpolation interpolation) is applied to months for which data are not explicitly available in the publications accessed; thus, the data are presented as an illustration of quantitative analysis for the purpose of learning Monetary Economics research methodology, and do not constitute definitive official figures from Bank Indonesia for each month.

Table 3. Research Variables and Operational Definitions

Variable	Operational Definition	Unit	Scale
Foreign Exchange Reserves (X1)	Indonesia's foreign exchange reserves at the end of the month, as published by Bank Indonesia	Billions of USD	Ratio
Interest Rate (X2)	BI Rate/BI 7-Day Reverse Repo Rate as determined by the Board of Governors' meeting in the relevant month	Percent (%)	Ratio
Rupiah Exchange Rate (Y)	Monthly average central exchange rate/JISDOR of the Rupiah against the U.S. Dollar, as a proxy for exchange rate stability	Rp/USD	Ratio

Data Collection Methods

Data was collected through documentation, specifically by compiling secondary data from official reports and press releases issued by Bank Indonesia, as well as other reliable economic databases, which were then organized into a monthly panel dataset ready for statistical analysis.

Data Analysis Techniques

Data analysis was conducted in the following stages:

1. Descriptive statistical analysis to describe the characteristics of the data (minimum, maximum, mean, and standard deviation).
2. Tests of classical assumptions, including the normality test (Shapiro-Wilk), the multicollinearity test (Variance Inflation Factor/VIF), heteroscedasticity test (Glejser test), and autocorrelation test (Durbin-Watson).
3. Multiple linear regression analysis to determine the direction and magnitude of the influence of foreign exchange reserves and interest rates on the rupiah exchange rate.
4. Hypothesis testing using the t-test (partial) and F-test (simultaneous) at a 5% significance level ($\alpha = 0.05$).
5. Test of the coefficient of determination (R^2) to determine the extent of the independent variables' contribution to the dependent variable.

The multiple linear regression model used is formulated as follows:

$$Y = a + b1X1 + b2X2 + e$$

Notes: Y = Rupiah Exchange Rate; a = Constant; b1, b2 = Regression coefficients; X1 = Foreign Exchange Reserves; X2 = Interest Rate; e = Error term.

4. Result and Discussions

Research Data Description

The research data covers 24 monthly observations from July 2024 through June 2026 for the variables of foreign exchange reserves, the benchmark interest rate, and the exchange rate of the rupiah against the U.S. dollar, as presented in Table 4 below.

Table 4. Research Data

Month	Foreign Exchange Reserves (Billion USD)	BI Policy Rate (%)	Rupiah Exchange Rate (IDR/USD)
Jul-2024	145.71	6.25	16.117
Aug-2024	146.29	6.25	16.115
Sep-2024	147.71	6.25	15.998
Oct-2024	149.20	6.00	16.048
Nov-2024	149.10	6.00	15.947
Dec-2024	150.06	6.00	15.924
Jan-2025	151.67	5.75	15.864
Feb-2025	151.71	5.75	16.094
Mar-2025	151.49	5.50	16.066
Apr-2025	152.62	5.50	16.087
Mai-2025	152.53	5.25	16.283
Jun-2025	153.06	5.25	16.243
Jul-2025	154.00	5.00	16.413
Aug-2025	153.23	5.00	16.362
Sep-2025	153.87	4.75	16.480
Oct-2025	155.09	4.75	16.652
Nov-2025	155.34	4.75	16.764
Dec-2025	156.66	4.75	16.810
Jan-2026	154.04	4.75	16.960
Feb-2026	151.05	4.75	17.115
Mar-2026	149.03	4.75	17.211
Apr-2026	146.06	4.75	17.597
Mai-2026	144.94	5.25	17.846
Jun-2026	144.75	5.75	17.963

Based on Table 2, it can be seen that foreign exchange reserves followed an upward trend from Rp145.71 billion USD in July 2024 to a peak of Rp156.66 billion USD in December 2025, then declined steadily to Rp144.75 billion USD in June 2026. Conversely, the benchmark interest rate showed a downward trend from 6.25% in mid-2024 to 4.75% and remained at that level from September 2025 through April 2026, before being gradually raised again to 5.75% in June 2026 in response to pressure from the weakening rupiah. The rupiah exchange rate itself shows a consistent weakening trend throughout the observation period, from around Rp16,117 per U.S. dollar in July 2024 to Rp17,963 per U.S. dollar in June 2026.

Table 5. Descriptive Statistics

Variable	Minimum	Maximum	Mean	Standard Deviation
Foreign Exchange Reserves (Billions of USD)	144,75	156,66	150,80	3,50
Interest Rate (%)	4,75	6,25	5,36	0,57
Rupiah Exchange Rate (Rp/USD)	15.864	17.963	16.540	620,6

Results of the Classical Assumptions Test

1. Normality Test: The Shapiro-Wilk normality test yielded a statistic of 0.858 with a p-value of 0.003 ($p < 0.05$), indicating that the model's residuals are not fully normally distributed. This condition is relatively common in macroeconomic time series data that exhibit a trend, causing the residuals to tend to be concentrated along that trend pattern.

2. Multicollinearity Test The results of the multicollinearity test show that the Variance Inflation Factor (VIF) values for foreign exchange reserves and interest rates are 1.48, respectively-well below the threshold of 10. This indicates that there are no serious multicollinearity issues between the two independent variables, so the regression coefficients can be interpreted independently.
3. Heteroscedasticity Test: The Glejser test yielded significance values of 0.024 for foreign exchange reserves and 0.035 for interest rates (both $p < 0.05$), indicating the presence of heteroscedasticity in the model. This is to be expected given the sharp increase in exchange rate volatility during certain periods, particularly during the geopolitical turmoil and global financial market uncertainty in early 2026.
4. Autocorrelation Test: The Durbin-Watson statistic obtained is 0.878, which is well below the critical value that indicates the absence of autocorrelation (close to 2). This value indicates the presence of fairly strong positive autocorrelation in the model's residuals, a common characteristic of non-stationary economic time series data (which exhibit a long-term trend).

The discovery of violations of some classical assumptions—particularly autocorrelation and heteroscedasticity—is common in macroeconomic time-series regression analyses that do not first undergo a differencing process or a stationarity test. Therefore, the regression results in this study can still be used to examine the direction and strength of the relationship between variables; however, the interpretation of significance levels must be approached with caution, and further research is recommended using more appropriate time series approaches, such as the Error Correction Model (ECM) or the Autoregressive Distributed Lag (ARDL) model, which can accommodate the non-stationary nature of the data.

Table 6. **Results of Multiple Linear Regression Analysis**

Variable	Coefficient (B)	Standard Error	t-value	Sig.
Constants	45.952,48	3.655,59	12,571	0,000
Foreign Exchange Reserves (X1)	-154,84	21,26	-7,282	0,000
Interest Rate (X2)	-1.130,15	131,35	-8,604	0,000

Based on the results of the regression analysis in Table 4, the multiple linear regression equation is as follows:

$$Y = 45.952,48 - 154,84\,X1 - 1.130,15\,X2$$

A constant value of 45,952.48 indicates that if foreign exchange reserves and the interest rate were zero, the rupiah exchange rate would be predicted to be at that level (this value is theoretical and does not represent real-world conditions, as both variables never equal zero in practice). The foreign exchange reserve coefficient of -154.84 indicates that every 1 billion USD increase in foreign exchange reserves is predicted to decrease (strengthen) the rupiah exchange rate by Rp154.84 per U.S. dollar, assuming the interest rate variable remains constant (ceteris paribus). The interest rate coefficient of -1,130.15 indicates that every 1 percent increase in the benchmark interest rate is predicted to depreciate (strengthen) the rupiah exchange rate by Rp1,130.15 per U.S. dollar, assuming foreign exchange reserves remain constant.

t-Test (Partial)

The t-table value at degrees of freedom (df) = n-k-1 = 21 and $\alpha = 0.05$ (two-tailed test) is 2.080. The foreign exchange reserves variable has a calculated t-value of -7.282 with a p-value of 0.000, where the absolute value of the calculated t-value (7.282) is greater than the t-table value (2.080) and the p-value is less than 0.05; therefore, H1 is accepted: foreign exchange reserves have a a negative and significant effect on the rupiah exchange rate. The interest rate variable has a calculated t-value of -8.604 with a significance level of 0.000, where the absolute value of the calculated t-value (8.604) is greater than the critical t-value (2.080) and the significance level is less than 0.05; therefore, H2 is accepted: the interest rate has a negative and significant effect on the rupiah exchange rate.

F-Test (Simultaneous)

The results of the F-test yielded a calculated F-value of 41.177 with a p-value of 0.000. The critical F-value at df1 = 2 and df2 = 21 at α = 0.05 is 3.467. Since the calculated F-value (41.177) is greater than the critical F-value (3.467) and the significance level is less than 0.05, H3 is accepted: foreign exchange reserves and interest rates simultaneously have a significant effect on the exchange rate of the rupiah.

Coefficient of Determination (R^2)

The coefficient of determination (R^2) was found to be 0.797, or 79.68%, and the adjusted R^2 was 0.777, or 77.75%. These values indicate that 79.68% of the variation in the rupiah exchange rate can be explained jointly by the foreign exchange reserves and interest rate variables, while the remaining 20.32% is explained by other factors outside the model, such as global market sentiment, the monetary policies of developed countries (particularly the interest rate policies of the central banks), the trade balance, portfolio capital flows, and geopolitical factors.

Correlation Analysis Between Variables

The results of the Pearson correlation analysis show a correlation between foreign exchange reserves and the exchange rate of the rupiah of -0.284 (weak negative correlation), a correlation between interest rates and the exchange rate of the rupiah of -0.533 (moderate negative correlation), and a correlation between foreign exchange reserves and interest rates of -0.571 (moderate negative correlation). The negative correlation between foreign exchange reserves and interest rates indicates that during periods of high interest rates, foreign exchange reserves are relatively lower, consistent with the pattern at the beginning of the observation period (2024) when interest rates were still high following a period of global monetary tightening, as well as the pattern at the end of the observation period (2026), when rising interest rates were accompanied by a decline in foreign exchange reserves due to market intervention.

Discussion

The Effect of Foreign Exchange Reserves on the Rupiah Exchange Rate

The results of the study indicate that foreign exchange reserves have a negative and significant effect on the rupiah exchange rate, meaning that an increase in foreign exchange reserves tends to be followed by an appreciation of the rupiah. This finding is consistent with the theory that foreign exchange reserves serve as a buffer that boosts market confidence in the resilience of the external sector, while also providing greater room for intervention by Bank Indonesia to counter depreciation pressures. However, empirical evidence from January through June 2026 reveals an interesting dynamic: foreign exchange reserves actually declined alongside the Rupiah's depreciation, as the decrease in reserves during that period was a direct consequence of Bank Indonesia's active intervention by Bank Indonesia to stem a deeper depreciation, not the cause of the weakening itself. This confirms that the relationship between foreign exchange reserves and the exchange rate is bidirectional (simultaneous): pressure for the rupiah to weaken drives the use of foreign exchange reserves for intervention, while an adequate level of foreign exchange reserves, in turn, limits the risk of more extreme depreciation.

The Effect of Interest Rates on the Rupiah Exchange Rate

The benchmark interest rate has been shown to have a negative and significant effect on the Rupiah exchange rate, in line with the interest rate parity theory, which states that an increase in domestic interest rates enhances the attractiveness of domestic assets to foreign investors, thereby driving currency appreciation. This phenomenon was clearly evident in the series of BI-Rate hikes from May through June 2026, during which each interest rate hike was met by the market with a renewed influx of foreign capital into Government Securities and Bank Indonesia Rupiah Securities, which helped stem the Rupiah's depreciation despite persistent external pressures. Conversely, during the period of interest rate cuts from late 2024 through mid-2025—aimed at stimulating economic growth—the Rupiah tended to follow a trend of gradual depreciation, indicating a trade-off between the goals of economic growth and exchange rate stability that must be carefully managed by monetary authorities.

Simultaneous Effects and Policy Implications

The significant simultaneous effects of foreign exchange reserves and interest rates on the Rupiah exchange rate—accounting for 79.68% of the variation—confirm that these two instruments are effective monetary policy tools for influencing exchange rate stability, although they are not the only determinants. The remaining 20.32% of the variation not explained by the model indicates the importance of external factors, such as the direction of interest rate policy by the U.S. central bank (the Federal Reserve), global geopolitical dynamics, and global investor risk sentiment, which also influence movements in the Rupiah exchange rate beyond the control of domestic policy alone. Consequently, an effective exchange rate stabilization policy requires a combination of strategies: maintaining adequate foreign exchange reserves as an intervention tool; credible and responsive interest rate management; and coordination with fiscal policy and the real sector to strengthen long-term economic fundamentals, including improving the trade balance and diversifying sources of foreign exchange to reduce dependence on market intervention.

Relevance to Economics Education

The findings of this study are highly relevant in the context of economics education at both the higher and secondary education levels. The phenomenon of a rise in the BI Rate that is met with a positive response in the form of a strengthening exchange rate, or a decline in foreign exchange reserves due to market intervention, serves as a concrete example that educators can use to explain abstract concepts such as contractionary and expansionary monetary policy, interest rate parity, and central bank intervention to students in a contextual manner based on actual data, thereby making monetary economics education more practical and relevant to current economic dynamics.

Critical Period Analysis

To provide a deeper understanding of the regression results, the following analysis focuses on three critical periods that reflect the dynamics of the relationships between variables in a more contextual manner.

Interest Rate Cut Period (October 2024 – August 2025)

During this period, Bank Indonesia gradually lowered the BI Rate from 6.00% to 5.00% to stimulate domestic economic growth amid a global slowdown. In line with the interest rate cuts, foreign exchange reserves remained relatively stable and even tended to increase as there was no significant depreciation pressure, while the exchange rate of the rupiah remained relatively stable in the range of Rp15,900–Rp16,400 per U.S. dollar. These conditions indicate that interest rate cuts do not necessarily trigger a sharp depreciation as long as global market sentiment remains favorable and the interest rate differential with developed countries remains adequate.

Period of Stability with Low Interest Rates (September 2025 – April 2026)

During this period, the BI Rate stood at its lowest level throughout the observation period, namely 4.75%, while foreign exchange reserves peaked in December 2025 at 156.66 billion U.S. dollars. Nevertheless, the rupiah exchange rate began to show a consistent weakening trend entering early 2026, triggered by increasing uncertainty in global financial markets as well as geopolitical turmoil. This phenomenon indicates that maintaining low interest rates for too long even when supported by high foreign exchange reserves—still risks putting downward pressure on the exchange rate if not counterbalanced by policy responses that are responsive to shifts in market sentiment.

Re-Tightening Period (May–June 2026)

In response to the Rupiah's deepening depreciation, which approached the psychological level of Rp18,000 per U.S. dollar, Bank Indonesia tightened monetary policy through three consecutive increases in the BI Rate from 4.75% to 5.75% over a period of less than two months. This policy gradually succeeded in stemming the pace of depreciation and driving the Rupiah's appreciation in the

short term, as evidenced by the return of foreign capital inflows into SBN and SRBI instruments. However, this tightening policy was also accompanied by significant use of foreign exchange reserves for direct intervention in the spot, NDF, and DNDF markets, indicating that the effectiveness of interest rates in stemming depreciation during periods of high pressure still requires simultaneous support from foreign exchange reserve interventions. The analysis of these three periods reinforces the regression findings that the relationship between foreign exchange reserves, interest rates, and the exchange rate is dynamic and mutually influential (interdependent), rather than a static, one-way relationship. The effectiveness of both policy instruments is highly dependent on the context of external pressures faced during each period.

Limitations of the Study

The study used a relatively short observation period (24 months), so the results may not necessarily be generalizable to the long term. The regression model did not include other potential external variables such as inflation, Federal Reserve interest rates, and the trade balance, which theoretically also influence the exchange rate. Data for certain monthly points were obtained through linear interpolation due to limited access to all official monthly publications; therefore, the results are illustrative for the purpose of learning research methodology. The discovery of violations of classical assumption tests (autocorrelation and heteroscedasticity) indicates the need for a more appropriate time-series modeling approach in future research.

5. Conclusion

Foreign exchange reserves have a negative and significant effect on the rupiah exchange rate, meaning that an increase in foreign exchange reserves is associated with a strengthening of the rupiah, with a t-statistic of -7.282 and a significance level of 0.000. The benchmark interest rate has a negative and significant effect on the rupiah exchange rate, in line with the interest rate parity theory, with a t-statistic of -8.604 and a significance level of 0.000. Foreign exchange reserves and the interest rate simultaneously have a significant effect on the rupiah exchange rate, with an F-statistic of 41.177 and a significance level of 0.000. The contribution of foreign exchange reserves and the interest rate in explaining the variation in the amounts to 79.68% (R^2), while the remaining 20.32% is explained by other factors outside the model. There are indications of partial violations of classical assumptions (autocorrelation and heteroscedasticity), which are commonly found in nonstationary macroeconomic time series data; therefore, the results should be interpreted accordingly.

Recommendations

The Acknowledgement section is optional, in that it is presented to express the author's gratitude to individuals or institutions or parties that provided support, guidance, or resources during the research. The author recognizes these valuable contributions, ranging from academic guidance, financial support, to technical assistance. Acknowledgement reflects the author's gratitude towards collaborators, mentors, and others who helped make this research a success.

References

Adhawiyah, R., Prajawati, M. I., & Firdian, R. (2018). Pengaruh paritas daya beli, paritas suku bunga terhadap nilai tukar rupiah dan dollar Amerika Serikat. *Iqtishoduna*, *14*(1), 55–70.

Adiansyah, A. P. (2025). *Pengaruh Nilai Tukar, Pertumbuhan Ekonomi dan Tingkat Suku Bunga terhadap Foreign Direct Investment (FDI)*. Universitas Hayam Wuruk Perbanas.

Astuti, S. T., & Hidayat, W. (2021). Analisis stabilitas cadangan devisa di Indonesia. *JDEP (Jurnal Dinamika Ekonomi Pembangunan)*, *4*(2), 114–118.

Gugun, G., Azkiya, F. B., Putri, N. A., Putri, N., Nabilah, A., & Syahwildan, M. (2025). Analisis Teori Paritas Daya Beli Bahan Pokok:(Studi Kasus pada Pengaruh Dampak Nilai Tukar, Kebijakan Moneter, dan Inflasi di Indonesia). *Jurnal Maneksi (Management Ekonomi Dan Akuntansi)*, *14*(1), 67–73.

Gunawan, R., Khasanah, U., & Shayo, A. (2025). An empirical analysis of the effects of macroeconomic variables on exchange rate: A time series analysis using ECM. *Optimum: Jurnal Ekonomi Dan Pembangunan*, *15*(2), 231–238.

Indonesia, B. (2024). *BI 7-Day (Reverse) Repo Rate*.

Khamidah, W., & Sugiharti, R. (2022). Faktor yang Mempengaruhi Nilai Tukar Rupiah Terhadap Dolar Amerika, Euro dan Poundsterling. *Ecoplan*, *5*(1), 40–52.

Putri, S. A., & others. (2025). DAMPAK NILAI TUKAR TERHADAP PERDAGANGAN INTERNASIONAL GLOBAL. *Jurnal Media Akademik (JMA)*, *3*(12).

Ramadhani, A. A. P., & others. (2023). *ANALISIS PENGARUH CADANGAN DEVISA SUKU BUNGA DAN JUMLAH UANG BEREDAR TERHADAP NILAI TUKAR= ANALYSIS OG THE INFLUENCE OF FOREIGN EXCHANGE RESERVE, INTEREST RATES AND AMOUNT OF MONEY SUOOLY ON THE EXCHANGE RATE*. Universitas Hasanuddin.

Sianipar, G. M. A. (2026). ANALISIS PENGARUH KEBIJAKAN MONETER BANK INDONESIA TERHADAP PERTUMBUHAN EKONOMI, INFLASI DAN NILAI TUKAR DI INDONESIA. *Jurnal Penelitian Dan Inovasi Universal*, *10*(1).

Ullah, S., Ali, A., & Alam, M. (2025). Central Bank Independence, Policy Tools, and Macroeconomic Outcomes in A Changing Global Environment. *Research Consortium Archive*, *3*(3), 881–905.