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ANALYSIS OF MACROECONOMIC VARIABLES ON THE GROWTH OF MONEY SUPPLY M2 IN INDONESIA

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Abstract: This investigation scrutinizes the implications of macroeconomic determinants, specifically the authentic interest coefficient, monetary devaluation, Jakarta Stock Exchange Composite Index (JSECI), international currency reserves, and conversion rates upon monetary supply (M2) within Indonesia throughout the temporal span 1990-2023 utilizing the Autoregressive Distributed Lag (ARDL) methodology. The investigative outcomes demonstrate that within abbreviated temporal frameworks, the authentic interest coefficient, monetary devaluation, JSECI, international currency reserves, and conversion rates exhibit constructive and substantial implications upon M2. Throughout extended durations, the authentic interest coefficient and JSECI manifest substantial adverse implications upon M2, whereas monetary devaluation and international currency reserves demonstrate negative and substantial implications, and the conversion rate maintains constructive and substantial characteristics. These discoveries indicate that monetary devaluation and international currency reserves constitute the primary catalysts of M2 fluctuations, whereas the function of JSECI remains confined to abbreviated temporal periods. This investigation advocates optimal administration of international currency reserves and calibrated monetary strategy to preserve M2 equilibrium for supporting national economic advancement. The outcomes of this investigation are anticipated to serve as guidance for Bank Indonesia in formulating efficient monetary strategy.

Keywords: Money Supply M2, Real Interest Rate, Inflation, Composite Stock Price Index, Foreign Exchange Reserves, Exchange Rate

INTRODUCTION

Money supply (M2) is important as an indicator of a country's economy. Money supply is the total of currency and demand deposits held by the public, reflecting the liquidity available in the financial system (Mamuaja et al., 2024) The optimal amount promotes growth through increased consumption and investment. But excess amounts can trigger inflation. So, the central bank needs to keep the money supply stable and in line with needs. M2 is a broad definition of money supply that includes M1 (currency and demand deposits) plus quasi money (near money). This quasi money component consists of savings, time deposits, and domestic private foreign exchange accounts. With a more comprehensive coverage, M2 provides a more complete picture of liquidity in the economy. As a monetary indicator, M2 has a strategic role in the formulation of economic policy as it reflects people's purchasing power as well as the potential for

economic activity. An increase in M2 may indicate that there is more money available to spend, which can support economic growth. However, if this increase occurs too quickly, it could pose a risk of inflation, which could negatively impact economic stability (Elvina et al., 2021).

The central bank uses various monetary policy instruments to influence the M2 money supply, such as open market operations, setting the benchmark interest rate, and regulating the minimum required reserves of banks. Monetary policy is a measure taken by the government to try to improve economic conditions by determining the amount of foreign currency deposits. The monetary elements include base money (M0), narrow scope money (M1), and more extensive circulation money (M2), all of which are integrated into the total monetary aggregate.(M2) (Marasabessy, 2022). Money supply in society must be controlled. Controlling the money supply is one of the responsibilities of the monetary authority in carrying out monetary policy. Money control can be in the form of adding money supply (monetary expansion provisions) and reducing money supply (monetary contraction provisions). In general, management of the money supply can keep the value of money stable and encourage the economy. (Surjono & Handayani, 2013).

Source: Bank Indonesia

Figure 1 Money Supply in Indonesia 1990 – 2023

The money supply in Indonesia indicates a sharp increase from 1990 to 2023 based on World Bank data. The increase took place gradually every year at a rate of 5% to 38%. The growth chart shows the lowest increase in 2001 from 844,053 trillion to 883,908 trillion in 2002. While the biggest jump occurred in 1997 from 355,643 trillion to 577,381 trillion in 1998. It is suspected that this increase was caused by the increase in income and the real money of the community mostly came from savings, deposits, and foreign exchange. This trend of increasing money supply continued in line with Indonesia's economic stability, a growing foreign asset surplus, and financial expansion by the government and central bank. With a larger monetary base as a result of these factors, the proportion of money in circulation in the community also grew.

LITERATURE REVIEW

Money Supply

Money supply M2 is a monetary indicator that greatly impacts the stability of a nation. M2 is one measure of the money supply in a broad sense that is used as an important indicator in monetary terms. According to Perry Warjiyo, M2 is defined as the money supply in a broad sense which includes M1 (currency and demand deposits) accompanied by quasi money (time deposits and saving deposits) (Warjiyo & Solikin, 2003). Bank Indonesia controls the volume of money in the economic system in an effort to maintain the stability of the price level faced by the public.

The money supply includes currency, quasi and demand deposits. Cash is money announced by Bank Indonesia, which consists of coins and banknotes. There is cash received into the state treasury, such as tax deposits, and there is cash that goes to the commercial bank treasury, such as public deposits to commercial banks. Giral money is money issued by commercial banks which is the balance of accounts in the bank. Quasi-money is financial instruments issued from commercial banks, including savings accounts, time deposits, and foreign currency accounts held by the domestic private sector.(Musyaffa' & Sulasmiyati, 2017).

The quantity theory of money consists of two main approaches that differ in focus. Irving Fisher's theory in "The Purchasing Power of Money" emphasizes the direct relationship between the money supply and the price level, where an increase in the money supply will lead to higher prices and lower purchasing power. While the Cambridge Theory (Marshall-Pigou) focuses more on individual behavior in allocating assets based on profit and loss analysis, where Marshall sees money saved for transactions and Pigou adds the motivation of saving as an emergency reserve fund. These two theories complement each other in explaining the dynamics of money supply with different approaches between mechanical and behavioral

Real Interest Rate

The interest rate is an important economic indicator that is often of concern to economic players. Fisher's Theory of Interest in the book entitled "The Theory of Interests" says that interest is not part of the income received by capital, but part of the income stream. All factors of production generate a flow of income every time. If the return on land in the form of land rent is capitalized against the value of the land, the return is interest (Soewito, 1984). High interest rates reduce investment interest, while low interest rates increase investment because they act as a cost of borrowing. Interest rates have a direct impact on the economy and affect consumption, savings, and investment decisions. (Fahrika & Buhasyim, 2021).

There are several approaches to understanding interest rates. First, The concept of interest rates can be understood through two main perspectives. First, the real interest rate which is the result of subtracting the inflation rate from the nominal interest rate. Second, the concept of yield to maturity which provides a more comprehensive picture of the rate of return on investment by considering the present value of all cash flows generated by the debt instrument. The correlation between interest rates and bond yields indicates an opposite pattern - an increase in interest rates will cause a decrease in bond prices which will result in an increase in bond yields, thus creating a positive correlation between interest rates and yield to maturity. John Maynard Keynes in his work "The General Theory of Employment, Interest and Money" introduced the theory of liquidity

preference as a framework for understanding the determinants of interest rates in an economic system. The theory applies the basic principles of supply and demand, where according to Keynes, interest rates undergo continuous adjustment to create a balance between money supply and money demand, despite the various variables that affect the level of demand for money, one that the liquidity preference theory emphasizes is interest rates. According to the liquidity preference theory, interest rates constantly adjust to balance the money supply with the demand for money (Mankiw, 2011).

Inflation

Inflation is an economic problem that often concerns economists. The primary objective of economic systems constitutes preserving monetary equilibrium. Demand-Induced Inflationary Theory This theoretical framework elucidates that the phenomenon of monetary devaluation emerges when collective demand surpasses collective supply during periods when the economy achieves maximum employment capacity this excess demand pushes up prices as the economy is unable to increase output further. Inflation is recognized by a general and sustained increase in the prices of goods, which basically indicates a misalignment between supply and demand in a nation's economy. (Saefulloh et al., 2023). It is explained that there are three conditions that must be met to be called inflation, namely: first, there is an increase in prices; second, it is comprehensive; and third, it is sustainable (Afriyanti & Prasetiyo, 2021)

According to Wafa Raihanny Salam in "Inflation in the Midst of a Pandemic in an Islamic Perspective", inflation is a complex economic phenomenon that occurs when the value of a currency decreases against assets such as gold or foreign currency. In Indonesia, inflation has a broad impact on people's lives through rising prices of goods and services, affecting economic decisions between consumption and investment. Inflation also disrupts business planning, reduces production efficiency, reduces people's purchasing power, and worsens economic inequality. Controlling inflation requires balanced monetary and fiscal policies to maintain price stability and support economic growth. (Salam, 2020).

Composite Stock Price Index

The Aggregate Equity Valuation Index constitutes a singular category of benchmark within the Indonesian Securities Exchange. The JCI functions to evaluate the comprehensive performance of securities registered on the trading platform. by including all such stocks in the index calculation. This index is operated to monitor the dynamics and general condition of the capital market, not the performance of specific companies. The JCI reflects price shifts of all common and preferred stocks listed on the IDX. (Hayati et al., 2020).The JCI is an index that symbolizes the full stock price activity on the stock exchange, operating as an indicator of the development of capital market activity. This index can be used to evaluate market conditions What is the trend of stock price changes these days - moving positively or negatively The JCI serves as a barometer that describes all shares of issuers listed on the stock exchange. (Kusnandar et al., 2023).

Volume of foreign investors makes stock mobility on the stock exchange IDX follow the trend of the international stock exchange. Local investors also often follow the steps of foreign investors, so that the JCI is difficult to escape from the influence of the global stock exchange index.(Paranita et al., 2017) Some factors that affect the IHSG are inflation, interest rates, gold prices, and world oil prices. Inflation is a general increase in the price of goods due to demand exceeding supply. High inflation increases a

company's production costs, reduces profits, and lowers the stock index. As a result, the stock market becomes less attractive and investors turn to alternative investments such as gold.(Priyono & Ismail, 2012).The Composite Stock Price Index on the Indonesia Stock Exchange (IDX) is determined based on a weighted average based on market value, where market value refers to the last share price traded on the exchange (Halim & Marcories, 2019). Calculating the IHSG with all listed stocks is inefficient because not all stocks have a significant impact on the market. With thousands of stocks available, the calculation becomes very complicated. Therefore, it is better to use the sampling method by selecting stocks that play an important role in the market. BEI implements this through LQ 45, an index of 45 stocks with high liquidity, large capitalization, and strong company fundamentals (IDX, 2021).

Foreign Exchange Reserves

International currency reserves constitute an exceptionally vital aspect and crucial financial parameter as they represent International monetary reserves serve as a significant indicator of a nation's economic robustness. These reserves comprise funds denominated in foreign currencies (such as dollars, euros, yen) managed by central banks to support the local currency and maintain the stability of the banking system.(Sayoga & Tan, 2017) International currency reserves demonstrate a nation's capacity to engage in global commerce and gauge the underlying robustness of the country's economic foundation. (Laurie, 2023). Foreign exchange reserves are international payment instruments consisting of gold, foreign currencies, and other foreign exchange claims. Theoretically, foreign exchange reserves are external assets that are liquid, in major foreign currencies, supervised by monetary authorities, and can be directly used for international transactions.(Yusuf & Ichsan, 2019).

The management and maintenance of foreign exchange reserves are carried out with reference to the foundation of an efficient income generation strategy. In Indonesia, the authority to manage foreign exchange reserves is regulated through Bank Indonesia Law Number 23 of 1999 which has been amended by Law Number 3 of 2004. Based on Article 13 of the Law, Bank Indonesia is authorized to manage foreign exchange reserves as part of the implementation of monetary provisions. These foreign exchange reserves are recorded in Bank Indonesia's balance sheet. In its implementation, Bank Indonesia can carry out several foreign exchange negotiations and receive loans to support the management (Tafara et al., 2022)

Exchange Rate

The exchange rate denotes the fee negotiated and endorsed by the populations of two distinct nations. when conducting trade activities. In general, the exchange rate can be explained as the value of a currency when compared to a Foreign denominations. For instance, the rupiah’s exchange ratio relative to the US dollar specifies the quantity of rupiahs required to acquire one dollar exchange rates are divided into two concepts: nominal and real. The nominal exchange rate describes the direct comparison between two currencies, such as 1 dollar is equivalent to 16,000 rupiah in money market transactions. Although the real exchange rate represents the proportion of goods prices across two nations that illustrates the capacity of trade or terms of trade, calculated using the nominal exchange rate (E), the US price level (P), and the Indonesian price level (P*)

to provide a more comprehensive picture of trade competitiveness. The authentic conversion rate between two nations is characterized as the multiplication of the nominal conversion rate and the comparative price coefficients of goods in both countries. obtained through a calculation that involves the nominal exchange rate as well as the price level in each country. When the authentic conversion rate escalates, imported products become relatively more affordable, while domestic products become more expensive. Conversely, if the real exchange rate decreases, the prices of imported goods will rise and local products will become more competitive at relatively cheaper prices.

METHOD

This investigation constitutes a descriptive research with a quantitative methodology based on statistical information to answer problems through accurate testing of various aspects of the study object in order to produce findings that can be generalized in the context of time, situation, and place. The quantitative approach is used to analyze and determine the relationship between real interest rates, inflation, composite stock price index, foreign exchange reserves, and exchange rates to the Money Supply (JUB) M2 in Indonesia in the period 1990–2023. This study uses time series data, namely data that is arranged chronologically based on the year of observation. The data used include JUB M2, real interest rates, inflation, composite stock price index, foreign exchange reserves, and exchange rates obtained from official sources, namely Bank Indonesia (BI) for JUB M2 data, inflation, and exchange rates; World Bank for real interest rate and foreign exchange reserves data; and Indonesia Stock Exchange (IDX) for composite stock price index data. All of these data are utilized to scrutinize the correlation between parameters during the period 1990 to 2023. This study uses a general model of ARDL.

$$LnEr_t = a_0 + a_{1i}\sum_{i=1}^{n} \Delta LnEr_{t-1} + a_{2i}\sum_{i=1}^{n} \Delta LnOp_{t-1} + a_{3i}\sum_{i=1}^{n} \Delta To_{t-1} + a_{4i}\sum_{i=1}^{n} \Delta Inf_{t-1} + a_{5i}\sum_{i=1}^{n} \Delta FDI_{t-1} + a_{6i}\sum_{i=1}^{n} \Delta Bc_{t-1} + \beta_1 LnOp_t + \beta_2 To_t + \beta_3 Inf_t + \beta_4 FDI_t + \beta_5 Bc_t + e_t$$

RESULTS

Stationarity Test

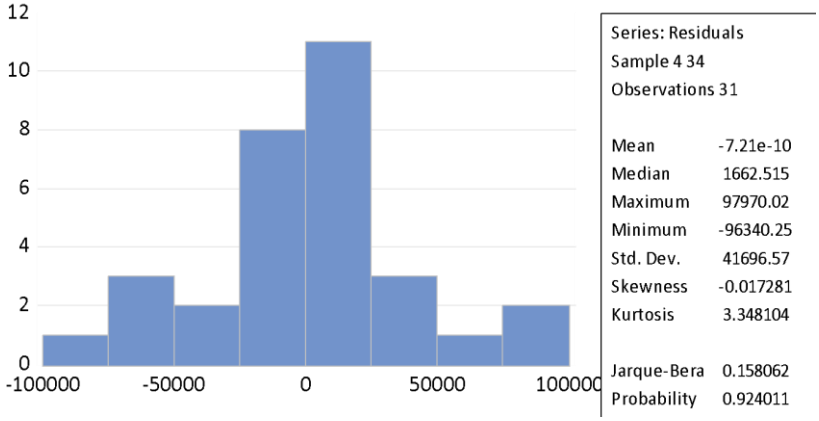
Table 1 Outcomes of the Unit Root Assessment at Level Form

Variabel	Phillips-Perron		Information
	Prob.	Significance Level	
Money Supply M2	0.0031	0,05	Stationary
Real Interest Rate	0.0000	0,05	Stationary
Inflation	0.0001	0,05	Stationary
JCI	0.0000	0,05	Stasiomer
Foreign Exchange Reserves	0.0000	0,05	Stationary
Exchange Rate	0.0003	0,05	Stationary

Source: Data processed, 2025

The tabulation elucidates that all parameters are characterized as stationary at the initial differential level, namely with a probability <0.05. Then it can be concluded that it can be continued in the classical assumption test.

Normality Test



Source: Data processed, 2025

Figure 2 Normality Test Results

It is observable that Figure of the normality test results states that the probability number obtained is 0.924011> 0.05, which means it is said to be normally distributed.

Autocorrelation Test

Table 2 Outcomes of the Serial Correlation Examination

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.310741	Prob. F(1,15)	0.5854
Obs*R-squared	0.629164	Prob. Chi-squared(1)	0.4277

Source: Data processed, 2025

The results obtained from table of the autocorrelation test show the prob value. Chi-squared 0.4277> 0.05, it can be said that there is no problem with autocorrelation.

Heterocedaksticity Test

Table 3 Results of Heteroscedasticity Test

Heteroskedastisitas Test : Breusch-Pagan-Godfrey			
F-statistic	2.783242	Prob. F(14,16)	0.0263
Obs*R-squared	21.97614	Prob. Chi-squared(14)	0.0791
Scaled explained SS	6.873141	Prob. Chi-squared(14)	0.9395

Source: Data processed, 2025

The results obtained from table above the heteroscedasticity test show with a prob value. Chi-squared 0.0791> 0.05, it can be articulated that no complications exist with variance heterogeneity.

Cointegration Test (Bound Test)

Table 4 Cointegration Test Results (Bounds Test)

	Value	K
F-Statistic	13.06703	5
Critical Value Bounds		
Significant	I(0)	I(I)Bound
10%	2.08	3

5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Source: Data processed, 2025

The F-statistic value of the limit test of 13.06703 is greater than the upper limit of I(1) which is 3.38 at alpha 0.05. This demonstrates that the parameters of real interest rates, inflation, IHSG, foreign exchange reserves, and exchange rates move together in the long term and cointegration occurs.

Stability Test (Cusum Test)

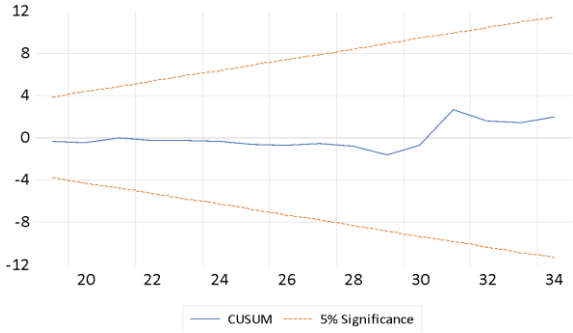


Figure 3 Findings from the CUSUM Stability Analysis

Source: Data processed, 2025

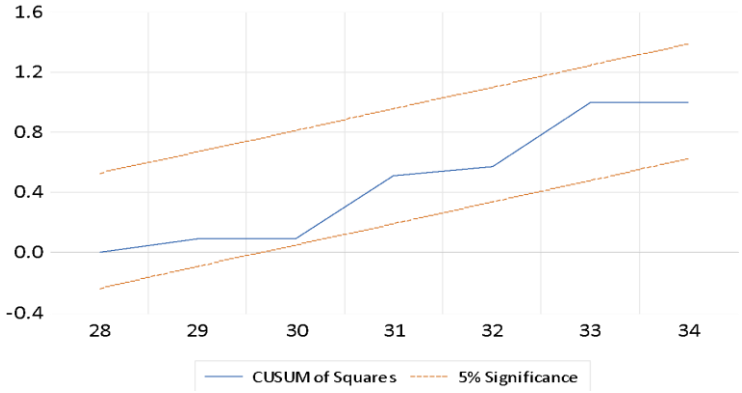


Figure 4 CusumQ Test Results

Source: Data processed, 2025

From Figure and also above, the CUSUM and CUSUMQ tests in this study can be used, because the results of this test line (blue) do not cross the upper and lower lines (red). With the results of this CUSUM and CUSUMQ test, it can be said to be stable and valid for use as an analysis.

Hypothesis Test

Determinant Coefficient Test (R2)

Table 5 Results of Determinant Coefficient (R2)

Adjusted R-squared	0.999759

Source: Data processed, 2025

The results seen in table above the value at Adjusted R-squared is 0.999549 which means close to one. And so that the independent variable real interest rate, inflation, ihsg,

foreign exchange reserves, the exchange the rate can account for 99% of the variance in the dependent variable, money supply, while the remaining 1% may be affected by extraneous variables beyond the scope of the model.

Simultas Test (F Test)

Table 6 F Test Results

F-statistic	Prob.(F-statistic)
4749.434	0.000000

Source: Data processed, 2025

From the table above above, the results of the F-statistic probability of 0.000000 are obtained, which means it is smaller than alpha 0.05. It is discernible that the explanatory variables of the real interest rate, inflation, ihsg, foreign exchange reserves, and exchange rates simultaneously and significantly affect the dependent variable Money Supply M2

Akaike Information Criteria (Optimum Lag)

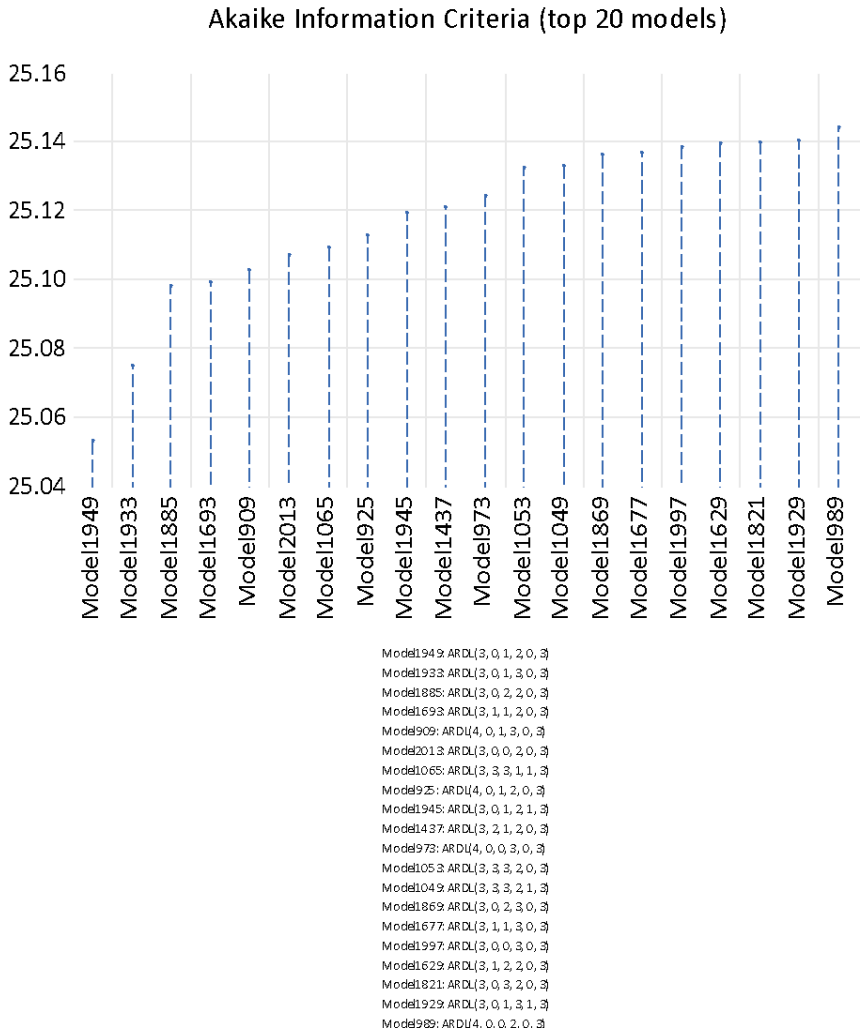


Figure 5 Akaike Information Criteria

Source: Data processed, 2025

Based on the figure above, the best lag findings show that using the Akaike Information Criterion (AIC) approach, the best and suitable model is ARDL (3,0,1,2,0,3) with a smaller error rate than other models. This means, the value of Y is 3 lags, X1 is 0 lags, X2 is 1 lag, X3 is 2 lags, X4 is 0 lags and X5 is 3 lags. After determining the optimum lag and confirming that the model is cointegrated, the next step is to operate the long-run estimation to determine the cointegrating correlation of each variable in the ARDL model. The ARDL specification used is in line with the (AIC) approach based on the outcomes of the optimal lag examination.

Short-Term Test

Table 7 Short-Term Test Results

Conditional Error Correction Regression					
Variable	**Coeffisient**	**Std. Error**	**t- Statistic**	**Prob.**	**Note**
c	-25984328	7741406.	0.000000	0.0000	Significant
Money Supply (3)	-1.305881	0.163165	-8.003427	0.0000	Significant
Real Interest Rate	-6104.120	9.159323	2.624696	0.0419	Significant
Inflation (1)	24.04044	0.003771	4.849974	0.0184	Significant
JCI (2)	1.031948	28.33524	0.036419	0.9714	Not Significant
Foreign Exchange Reserves	364888.4	79538.95	4.587543	0.0003	Significant
Exchange Rate (3)	38.26383	12.09025	3.164852	0.0060	Significant

Source: Data processed, 2025

Table above shows the results of the coefficients and probability values for each variable, Accordingly, the outcomes of the evaluation may be elucidated as outlined below

a. The Authentic Interest Coefficient parameter demonstrates an abbreviated-duration adverse coefficient of -6104.120. Subsequently, a 1% escalation in the authentic interest coefficient generates a 61.0% diminution in JUB. With a probability value of 0.0419, which remains beneath the 0.05 statistical threshold, this parameter exercises a statistically substantial and beneficial influence upon JUB.
b. The Monetary Devaluation (1) parameter demonstrates an affirmative coefficient of 24.04044 within the abbreviated-duration examination, signifying that a 1% escalation in monetary devaluation generates a 24.0% amplification in JUB. With a probability value of 0.0184, which remains beneath the 0.05 statistical threshold, it is deduced that this parameter possesses a statistically substantial constructive influence upon JUB.
c. The JSECI parameter (2) exhibits a constructive effect within the condensed temporal assessment of 1.031948, signifying that if the JSECI increases by 1%, the JUB experiences enhancement by 1.03%. With a probability coefficient of 0.9714, which surpasses the statistical benchmark of 0.05, it can be stated that it reveals a contradictory significant influence upon the JUB.
d. The International Monetary Reserve parameter demonstrates a constructive effect within the condensed temporal evaluation of 364888.4, indicating that should global currency reserves increase by 1%, JUB experiences enhancement by 36.4%. With a probability coefficient of 0.0003, which stays below the statistical benchmark of 0.05, it significantly and beneficially influences JUB.

e. condensed temporal evaluation of 38.26383, indicating that should the exchange coefficient increase by 1%, JUB experiences enhancement by 38.2%. With a probability coefficient of 0.0060, which stays below the statistical benchmark of 0.05, it reveals a beneficial and significant influence upon JUB.

Long-Term Testing

Table 8 Long-Term Test Results

Variable	Coeffisient	Std. Error	t-Statistic	Prob.	Note
Real Interest Rate	38307.14	19467.69	1.967729	0.06667	Not Significant
Inflation	-150.8687	52.01752	-2.900344	0.0104	Significant
JCI	299.2007	141.6772	2.111848	0.0508	Not Significant
Foreign Exchange Reserves	-2289901	382425.9	-5987829	0.0000	Significant
Exchange Rate	276.7664	52.00593	5.321824	0.0001	Significant
C	1.63E+08	41455463	3.933566	0.0012	Significant

Source: Processed data, 2025

Table The preceding section illustrates the outcomes of the coefficients and probability values for each variable, so that the analysis results can be described below:

a. The Real Interest Rate variable shows a coefficient value of 38307.14 and a probability value of 0.06667, indicating that in the long term, the Real Interest Rate variable has a negative and significant effect on the JUB variable.
b. The Inflation variable shows a coefficient value of -150.8687 and a probability value of 0.0104, indicating that in the long term, the Inflation variable has a positive and significant effect on the JUB variable.
c. The IHSG variable shows a coefficient value of 299.2007 and a probability value of 0.0508, meaning that in the long term, the IHSG variable has a negative and significant effect on the JUB variable.
d. The Foreign Exchange Reserves variable shows a coefficient value of -2289901 and a probability value of 0.0000, meaning that in the long term, the Foreign Exchange Reserves variable has a positive and significant effect on the JUB variable.
e. The Exchange Rate variable shows a coefficient value of 276.7664 and a probability value of 0.0001, which means that in the long term, the IHSG variable has a positive and significant effect on the JUB variable.

DISCUSSION

The Effect of Real Interest Rates on the Amount of Money in Circulation

Drawing from the evaluation, the Real Interest Rate exhibits a significant positive effect on the short-term JUB ($p=0.0419 <0.05$), but is not significant in the long term ($p=0.06667>0.05$).Short term: an increase in interest rates increases people's incentives to save funds in financial instruments, encourages money circulation and increases JUB. Long term: high interest rates reduce interest in borrowing and spending, reducing JUB according to Keynesian theory and monetary transmission. The Indonesian study for the period 1990-2023 confirms that this dynamic relationship changes direction depending on time, emphasizing the importance of distinguishing short-term and long-term effects in monetary policy.

The Effect of Inflation on the Amount of Money in Circulation

The analytical findings demonstrate that monetary devaluation exhibits a substantial constructive influence upon the quantity of currency in circulation across both abbreviated and extended temporal periods ($p = 0.0184$ and $p = 0.0104 < 0.05$). Within the abbreviated duration, the coefficient of 24.04044 indicates that when inflation increases, people need more money for transactions because prices rise, so that the JUB increases. The long-term coefficient of -150.8687 shows that even though there are adjustments to monetary policy, the positive relationship remains consistent according to the quantity theory of money. Indonesian data from 1990-2023 proves that inflation is the main factor driving the increase in JUB, where the monetary the governing institution expands the volume of currency circulating within the economy. to maintain the smooth running of economic activity when prices rise.

Effect of JCI on Money Supply

The results indicate that JCI has a negative and insignificant impact on JUB in the short term ($p=0.9714>0.05$) and is not significant in the long term ($p=0.0508>0.05$). In the short term, the decline in the JCI reduces the value of investor wealth, thereby reducing consumption and investment, triggering negative sentiment that encourages the withdrawal of funds from the stock market to safer instruments, inhibiting the flow of money to the real sector. However, in the long term, the influence of the JCI is not significant because structural factors such as inflation, interest rates, and Bank Indonesia's monetary policy are more dominant in regulating JUB. These macroeconomic variables are more effective in controlling credit availability, banking behavior, and overall economic stability, so that stock market performance alone is unable to change the amount of money in circulation sustainably.

The Influence of Foreign Exchange Reserves on the Amount of Money in Circulation

The analytical findings demonstrate that international monetary reserves exhibit a substantial constructive influence upon JUB across both abbreviated temporal periods (coefficient 364888.4, $p = 0.0003$) and extended durations (coefficient -2289901, $p = 0.0000$) in Indonesia for the duration1990-2023. The increase in foreign exchange reserves encourages an increase in money supply because it reflects economic stability and investor confidence, increases liquidity and allows intervention to maintain the currency valuation. Within a limited temporal scope, the stockpile of international reserves affect the availability of money through monetary policy, while in the long term it reflects strong economic fundamentals from increased exports and foreign investment. Good management of foreign exchange reserves is the key to macroeconomic stability and growth of money supply in Indonesia.

The Effect of Exchange Rates on the Amount of Money Supply

The results of the analysis show that the conversion rate possesses a significant positive effect on JUB in both the short term (coefficient 38.26, $p=0.0060$) and the long term (coefficient 276.77, $p=0.0001$). The long-term effect is greater due to broader economic adjustments such as capital inflows. When the rupiah strengthens, JUB increases significantly because a stable exchange rate increases the confidence of economic actors, encouraging trade and investment activities. A strengthening exchange rate also increases domestic purchasing power, so that people and business actors carry

out more transactions that require greater money circulation, in line with the findings (Goestjahjanti, 2024)

CONCLUSION

The analysis of the relationship between macroeconomic variables and money supply (JUB/M2) in Indonesia for the period 1990-2023 shows complex dynamics. Real interest rates have a significant positive impact in the short term as they encourage the placement of funds in the financial sector, but turn negative in the long term as they suppress consumption and investment, indicating the temporary effectiveness of interest rates. Inflation has a significant positive effect in both periods as it increases transaction needs and monetary authorities continue to increase money circulation to maintain economic activity. The JCI shows a significant negative effect in the short run as a decline in investor wealth reduces money demand, but is not significant in the long run as other structural factors are more dominant. Meanwhile, foreign exchange reserves and rupiah exchange rate both have significant positive effects in the short and long run, where foreign exchange reserves add liquidity through monetary intervention and reflect strong economic fundamentals, while exchange rate fluctuations increase transaction activity and exchange rate stability attracts investment which increases domestic liquidity. These findings confirm the importance of adaptive and integrated monetary policy to manage JUB effectively.

Implication

This study proves that macroeconomic variables such as real interest rates, inflation, IHSG, foreign exchange reserves, and exchange rates have a significant effect on the money supply (M2) in Indonesia in the short and long term. This finding strengthens the theory of the quantity of money and liquidity preference with empirical evidence using the ARDL approach. The outcomes of the investigation provide guidance for banks and economic actors in responding to macroeconomic dynamics, and emphasize the need for adaptive monetary policy that is integrated with fiscal policy. Management of inflation, foreign exchange reserves, and exchange rates are key to controlling the expansion of the currency supply effectively to maintain the stability of the national economy.

Limitation and Future Direction

This investigation possesses several constraints The analysis only covers five macroeconomic variables, so it does not consider other factors such as GDP, fiscal policy, or digital financial developments that can also affect the money supply (M2). In addition, the use of annual data can miss short-term dynamics, and the ARDL model used assumes a linear relationship between variables. In the future, research can expand the variables analyzed, use data with higher frequencies, and apply non-linear models or cross-country panel approaches. Research can also explore the influence of digital innovations such as e-money and crypto assets on M2, especially in the context of the post-pandemic digital economy.

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