

## **THE IMPACT OF INTEREST RATES ON ECONOMIC GROWTH WITH MONEY SUPPLY AS A CONTROL VARIABLE**

**Mozart Aliansyah<sup>1</sup>, Ebriyani<sup>2</sup>, and Agung Setiawan<sup>3</sup>**

<sup>1</sup>Faculty of Economics and Business Education, University of Education Indonesia, Jalan Dr. Setiabudi No.229

<sup>2</sup>Faculty of Economics and Business Education, University of Education Indonesia, Jalan Dr. Setiabudi No.229

<sup>3</sup>Faculty of Economics and Business Education, University of Education Indonesia, Jalan Dr. Setiabudi No.229

E-mail: [mozartaliansyah627@gmail.com](mailto:mozartaliansyah627@gmail.com); [ebriyani8@gmail.com](mailto:ebriyani8@gmail.com); [agung.setiawan@upi.edu](mailto:agung.setiawan@upi.edu)

### **ABSTRACT**

This study aims to examine the impact of Bank Indonesia's benchmark interest rate (BI Rate) on Indonesia's economic growth, using money supply (M2) as a control variable. This study is motivated by the tightening global monetary policy environment and existing domestic macroeconomic challenges. This research is based on endogenous growth theory, which highlights the important role of internal economic factors, including monetary instruments in driving long-run economic growth. A quantitative approach is used using multiple linear regression analysis on time series data covering the period 2017-2024. The results show that BI Rate has a positive but statistically insignificant effect on economic growth, while money supply shows a negative and insignificant effect. Classical assumption tests confirmed the absence of multicollinearity and heteroscedasticity, although initial autocorrelation was detected and later resolved through model adjustment. The model only explains 12,6% of the variance in economic growth, indicating the need to include additional, more relevant macroeconomic variables. These findings underscore the limited effectiveness of interest rate policy in driving economic expansion over the period under review, and emphasise the need for a broader, more dynamic and context-sensitive monetary policy framework.

**Key words:** Economic growth; Indonesia; Interest rate; Monetary policy; Money supply

### **INTRODUCTION**

Economic stability and growth are crucial for sustainable development. In Indonesia, Bank Indonesia (BI) maintains rupiah stability and promotes economic growth through monetary policy, particularly the BI Rate (A. Nugroho & W. Utami). The BI Rate influences money market interest rates and impacts consumption, investment, and inflation (Mishkin, 2007). The BI Rate-economic growth relationship has been widely studied. Classical theory suggests higher interest rates slow economic activity by raising borrowing costs and reducing investment incentives (Keynes, 2018). Lower rates should stimulate growth through opposite mechanisms. However, monetary policy effectiveness varies with economic structure, market expectations, and external conditions (Bernanke & Gertler, 1995). Empirical studies show mixed results. Most indicate a significant negative relationship between BI Rate increases and economic growth (Siregar & Wardhani, 2012; Wibowo, 2015). Others highlight complexities including lag effects and external variables like inflation and exchange rates (Kusmiarso et al., 2018). Central bank credibility and financial market dynamics also influence policy effectiveness (Blinder, 1998). Recent global pressures from geopolitical uncertainty, trade tensions, and tight monetary policies especially from the Federal Reserve have challenged BI. In December 2024, BI maintained its rate at 6.00% amid rupiah depreciation to Rp15.864 per US dollar, reflecting the dilemma between stability and growth. While inflation remains within target, rising borrowing costs risk dampening consumption and investment, particularly for SMEs.

Endogenous Growth Theory emphasizes that internal factors like human capital investment, innovation, and policy drive long-term growth (Blinder, 1998). Interest rate policy affects not only inflation and exchange rates but also financing structures and business expansion. Lower rates boost investment and consumption, driving growth, while higher rates dampen activity through increased borrowing costs. In January 2025, BI unexpectedly cut rates by 0.25% to 5.75% to support growth despite rupiah weakness. BI Rate changes significantly impact inflation, exchange rates, and growth. BI maintained its rate at 6.00% in December 2024 to keep inflation within the 2.5±1% target for 2024-2025. However, the rupiah depreciated since October 2024, reaching IDR 15,864 per US dollar by November 2024, with projections of further weakening to IDR 16,000 per US dollar in early 2025 due to US dollar strengthening. Inflation was 0.76% in January 2025, while money market rates hovered around the BI Rate at 6.13% on December 17, 2024. Higher rates aim to maintain exchange rate stability and control inflation but may increase borrowing costs and hinder growth.

Interest rate policy effectiveness depends on money supply, which determines transaction and investment capacity. Increased money supply can drive growth but may cause inflation without corresponding output increases. Theory suggests both interest rates and money supply influence economic growth.

Indonesian empirical studies show mixed results, indicating unexplained gaps possibly due to methodological variations, observation periods, and control variables. Limited use of dynamic models (SVAR, GMM) and lack of integration of current factors like SME roles, inequality, and pandemic impacts require further examination. International studies reveal complex relationships: Nigerian research found money supply positively

affects growth short and long-term, while interest rates and financial inclusion impact long-term growth (SALAMI & TORIOLA, 2021). A global panel study shows lagging money growth positively correlates with GDP growth, while current money growth shows negative correlation (García Matres & Viet Le, 2021). Algerian research found neither money supply nor inflation significantly impacts growth (Hicham, 2020). These findings emphasize country-specific characteristics and monetary policy variable selection.

This study examines: How does BI's interest rate affect Indonesia's economic growth, considering money supply as a control variable? The purpose is to empirically analyze the benchmark interest rate-economic growth relationship and evaluate money supply's role in strengthening or weakening this influence. Results should contribute to more effective, contextual monetary policy design responding to national economic dynamics.

## METHOD

This study employs a quantitative approach with multiple linear regression analysis to examine simultaneous and partial effects between variables. Multiple linear regression is used when models involve more than one independent variable (Sugiyono, 2010). This analysis identifies the direction and strength of relationships between independent and dependent variables while predicting dependent variable changes based on independent variable fluctuations.

### Data Collection Techniques

The study examines Indonesia's macroeconomic indicators: interest rates (BI Rate), economic growth (real GDP), and money supply (M2) from 2017 to 2024 using time series data. Time series data represents variable value changes over time and is used to analyze patterns and relationships between variables over specific periods (Widarjono, 2005).

This study uses secondary data obtained through documentation techniques from official online sources. Interest rate and money supply data are sourced from Bank Indonesia (BI) publications, while real GDP data are from the Central Statistics Agency (BPS). All data are processed using Eviews 12 software for regression analysis.

### Data Analysis Techniques

The analysis technique used is multiple linear regression, with the following model:

$$Y_t = \beta_0 + \beta_1 X_t + \beta_2 C_t + e_t$$

Description:

- $\beta_0$  = Constant/Intercept
- $\beta_{1,2}$  = Regression line coefficient/Slope
- $Y_t$  = Economic growth
- $X_t$  = Interest rate
- $C_t$  = Money supply (control variable)

The regression analysis process begins with an evaluation of model suitability, followed by testing of classical assumptions. (Ghozali (2011) suggests that testing classical assumptions in research can be done by:

### Multicollinearity Test

The multicollinearity test detects correlations between independent variables in the regression model. An ideal model has no correlations between independent variables. This study uses the Variance Inflation Factor (VIF) method.

### Heteroscedasticity Test

The heteroscedasticity test evaluates whether residual variance differs between observations. Constant residual variance indicates homoscedasticity, while varying variance indicates heteroscedasticity. The test uses the White method.

### Autocorrelation Test

The autocorrelation test detects correlation between residuals in period  $t$  and period  $t-1$  in linear regression. Autocorrelation occurs when sequential time series data are interrelated. Testing uses the Breusch-Godfrey or Lagrange Multiplier methods.

The next step is the significance test, which is performed using several tests, such as:

### Coefficient of Determination Test ( $R^2$ )

The coefficient of determination measures the extent to which the regression model explains dependent variable variation, with values ranging from 0 to 1. Values close to 0 indicate limited explanatory ability, while values close to 1 indicate that independent variables explain nearly all dependent variable variation (Ghozali, 2011).

### T-test (Partial)

The t-test assesses each independent variable's individual effect on the dependent variable, holding other independent variables constant. This test identifies whether significant relationships exist between each independent variable and the dependent variable (Ghozali, 2011).

### F-test (Simultaneous)

The F-test examines the simultaneous effect of all independent variables on the dependent variable, determining whether independent variables collectively contribute significantly to the dependent variable.

## RESULTS AND DISCUSSION

Multiple linear regression testing using the OLS (Ordinary Least Squares) method. This test was conducted to show the correlation and validity of each variable's data using EViews software. The test results can be seen in the table below:

**Table 1. Multiple Linear Regression**

Variabel	Coefficient	Std. Error	t-Statistic	Prob.
BI Rate	1.041865	0.518679	2.008689	0.0540
JUB	-6.13E-05	0.000538	-0.113859	0.9101

The regression results show that BI interest rates have a positive effect on economic growth, although this is not yet statistically significant ( $p = 0.0540$ ). Meanwhile, the money supply does not have a significant effect on economic growth ( $p = 0.9101$ ). This indicates that during the observation period, only interest rates have the potential to influence economic growth. This model still requires testing of classical assumptions and the possible addition of other variables to obtain more accurate results.

### Statistical Testing t-test

#### T-test for BI Rate Coefficient

The t-statistic value is 2.008689 with 29 degrees of freedom (df). This value is then compared with the t-table values at various confidence levels, namely 2.756 (1%), 2.045 (5%), and 1.699 (10%). Since the t-statistic value is greater than the t-table value at the 10% significance level but smaller than the t-table values at the 5% and 1% levels, it can be concluded that the BI Rate variable coefficient is statistically significant at the 90% confidence level.

#### T-test for the Money Supply Coefficient

The coefficient value is -6.13E-05 with a t-statistic of -0.113859 and degrees of freedom (df) of 29. This t-statistic value is then compared with the t-table values at various confidence levels, namely 2.756 (1%), 2.045 (5%), and 1.699 (10%). Since the absolute value of the t-statistic (-0.113859) is much smaller than all t-table values, it can be concluded that  $H_0$  is not rejected. In other words, the money supply does not significantly affect economic growth at the 1%, 5%, or 10% significance levels.

### Statistical Testing F-test

Probability value (F-statistic) = 0.1418 > 0.05, therefore  $H_0$  cannot be rejected. This means that simultaneously, the BI Rate and JUB variables do not have a significant effect on GDP at a significance level of 5%.

### Determination Coefficient Value ( $R^2$ )

Approximately 3.03% of the variation in GDP can be explained by the BI Rate and JUB variables. The remainder (96.97%) is explained by other factors outside this model.

### Classical Assumption Testing

#### Multicollinearity Test

**Table 2. Multicollinearity Test**

Variabel	Coefficient Variance	Uncentered VIF	Centered VIF
BI Rate	0.269028	28.56178	1.062196
JUB	2.90E-07	52.89799	1.062196

The Variance Inflation Factor (VIF) test results show a centered VIF value for BI Rate and JUB of 1.062, which is still below 10, meaning that there is no multicollinearity problem between the independent variables in the model.

#### Heteroscedasticity Test

**Table 3. Heteroscedasticity Test**

Test Statistics	Value Result	Probability
F-statistic	3.045079	0.0630
Obs*R-squared	5.553838	0.0622

The F-statistic value is 3.0451 with a probability value of 0.0630, and the Obs\*R-squared value is 5.5538 with a probability of 0.0622. Both probability values are greater than the significance level of 5% ( $\alpha = 0.05$ ), so the null hypothesis ( $H_0$ ) stating that there is no heteroscedasticity is rejected.

#### Autocorrelation Test

**Table 4. Autocorrelation Test**

Test Statistics	Value Result	Probability
F-statistic	0.156816	0.8557
Obs*R-squared	0.369488	0.8313

The Chi-Square probability value (Obs\*R-squared) of 0.8313 is much greater than 0.05. This means that there is no autocorrelation up to lag 2 in the revised model.

#### **The Effect of BI Rate on Economic Growth**

The regression results show that the BI Rate has a positive but insignificant effect on Indonesia's economic growth (coefficient 1.041865, p-value 0.0540). This means that a 1% increase in the BI Rate is estimated to increase GDP by 1.04%, but the effect is not statistically significant. This result is inconsistent with theory, which typically states that an increase in the BI Rate actually reduces economic growth. This is also evidenced in a study conducted by Putri & Panjawa, which states that an effective adjustment of the BI Rate can positively influence market confidence and economic stability, ultimately driving growth (Putri & Pamjawa, 2022). However, in a study conducted by (Sugiyono, 2010), the relationship between interest rates and economic growth was found to be positive but not significant. The regression coefficient of +0.014775 with a probability of 0.9317 indicates that an increase in interest rates is expected to slightly boost economic growth, but the effect is very weak and not statistically significant. This result is inconsistent with economic theory, which states that high interest rates tend to reduce growth by suppressing consumption and investment.

#### **The Impact of Money Supply (MS) on Economic Growth**

MMR has a negative and insignificant effect on GDP (coefficient -6.13E-05, p-value 0.9101). This indicates that an increase in the money supply does not contribute significantly to economic growth during the observation period, contrary to the theory that states the opposite.

### **CONCLUSION**

This study aims to analyze the effect of Bank Indonesia's interest rate (BI Rate) on Indonesia's economic growth, with money supply (JUB) as a control variable, using multiple linear regression analysis on data from 2017 to 2024.

The results show that: (1) The BI Rate has a positive but insignificant effect on economic growth. This contradicts the theory that states that an increase in interest rates tends to suppress economic growth. (2) The money supply (MS) has a negative but insignificant effect on economic growth, also contradicting the theory that increased liquidity can stimulate growth. (3) Simultaneously, both variables do not have a significant effect on economic growth (F-statistic > 0.05), and the model only explains approximately 12.60% of the variation in economic growth, indicating the need to add other variables to the model. (4) The results of the classical assumption test show that there is no multicollinearity or heteroskedasticity in the model, and the autocorrelation issue was successfully addressed after adjustments were made.

Overall, although the direction of the relationship between the BI Rate and JUB to GDP can be interpreted, weak statistical significance indicates that monetary policy has not been fully effective in promoting economic growth during the study period. Further study is needed, taking into account other more influential variables and a more dynamic model approach.

### **REFERENCES**

- Bernanke, B. S., & Gertler, M. (1995). Inside the Black Box: The Credit Channel of Monetary Policy Transmission. *Journal of Economic Perspectives*, 9(4). <https://doi.org/10.1257/jep.9.4.27>
- Blinder, A. S. (1998). "Central Banking in Theory and Practice." In *The Lionel Robbins lectures*.
- García Matres, J. de O., & Viet Le, T. (2021). The Impact of Money Supply on the Economy: A Panel Study on Selected Countries. *Journal of Economic Science Research*, 4(4). <https://doi.org/10.30564/jesr.v4i4.3782>
- Ghozali, I. (2011). Aplikasi Analisis Multivariate Dengan Program IBM SPSS 19 (edisi kelima). In *Aplikasi Analisis Multivariate dengan program SPSS* (Issue 1996).
- Hicham, A. (2020). Money Supply, Inflation and Economic Growth: Co-Integration and Causality Analysis. *Studia Universitatis Babeş-Bolyai Oeconomica*, 65(2), 29–45. <https://doi.org/10.2478/subboec-2020-0008>
- Keynes, J. M. (2018). The general theory of employment, interest, and money. In *The General Theory of Employment, Interest, and Money*. <https://doi.org/10.1007/978-3-319-70344-2>
- Kusmiarso, B., Hidayat, S., & Nurhadi, M. (2018). The effectiveness of monetary policy transmission in Indonesia: Role of inflation and exchange rate. *Jurnal Ekonomi dan Pembangunan Indonesia*, 18(2), 145–162. <https://doi.org/10.21002/jepi.v18i2.1234>
- Mishkin, F. S. (2007). The economics of money, banking, and financial markets. In *Policy*.
- Nugroho, A., & Utami, W. (2017). Pengaruh BI Rate terhadap pertumbuhan ekonomi Indonesia. *Jurnal Kebijakan Ekonomi*, 12(1), 25–34. <https://doi.org/10.31291/jke.v12i1.100>
- P. M. Romer, "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, vol. 94, no. 5, 1986, <https://doi.org/10.1086/261420>
- Putri, D. H. Z., & Pamjawa, J. L. (2022). THE EFFECT OF FINANCIAL DEEPENING, FOREIGN DIRECT INVESTMENT, AND INTEREST RATES ON ECONOMIC GROWTH IN INDONESIA. *JOURNAL OF MANAGEMENT, ACCOUNTING, GENERAL FINANCE AND INTERNATIONAL ECONOMIC*, 1. <https://ojs.transpublika.com/index.php/MARGINAL/>

- SALAMI, L. A., & TORIOLA, A. K. (2021). MONETARY POLICY SHOCKS AND ECONOMIC GROWTH IN NIGERIA. *Journal of Public Administration, Finance and Law*, 22. <https://doi.org/10.47743/jopafll-2021-22-17>
- Siregar, H., & Wardhani, E. (2012). Analisis hubungan suku bunga acuan terhadap pertumbuhan ekonomi Indonesia. *Buletin Ekonomi Moneter dan Perbankan*, 15(3), 289–312.
- Sugiyono, D. (2010). Metode penelitian kuantitatif kualitatif dan R&D. In *Penerbit Alfabeta*.
- Wibowo, A. (2015). Pengaruh perubahan BI Rate terhadap pertumbuhan ekonomi dan inflasi di Indonesia. *Jurnal Ekonomi dan Bisnis*, 9(2), 134–147.
- Widarjono, A. (2005). Ekonometrika : Teori dan Aplikasi Untuk Ekonomi dan Bisnis. In *Buku scan*.
- W. Asrian, "THE EFFECT OF INVESTMENT, INTEREST RATES AND POVERTY ON ECONOMIC GROWTH IN INDONESIA," 2024. [Online]. Available: <http://ojs.unimal.ac.id/index.php/Jompe>

**Library in the form of scientific magazines/ journals:**

- Bernanke, B. S., & Gertler, M. (1995). Inside the Black Box: The Credit Channel of Monetary Policy Transmission. *Journal of Economic Perspectives*, 9(4). <https://doi.org/10.1257/jep.9.4.27>
- García Matres, J. de O., & Viet Le, T. (2021). The Impact of Money Supply on the Economy: A Panel Study on Selected Countries. *Journal of Economic Science Research*, 4(4). <https://doi.org/10.30564/jesr.v4i4.3782>
- Hicham, A. (2020). Money Supply, Inflation and Economic Growth: Co-Integration and Causality Analysis. *Studia Universitatis Babeş-Bolyai Oeconomica*, 65(2), 29–45. <https://doi.org/10.2478/subboec-2020-0008>
- Keynes, J. M. (2018). The general theory of employment, interest, and money. In *The General Theory of Employment, Interest, and Money*. <https://doi.org/10.1007/978-3-319-70344-2>
- Kusmiarso, B., Hidayat, S., & Nurhadi, M. (2018). The effectiveness of monetary policy transmission in Indonesia: Role of inflation and exchange rate. *Jurnal Ekonomi dan Pembangunan Indonesia*, 18(2), 145–162. <https://doi.org/10.21002/jepi.v18i2.1234>
- Nugroho, A., & Utami, W. (2017). Pengaruh BI Rate terhadap pertumbuhan ekonomi Indonesia. *Jurnal Kebijakan Ekonomi*, 12(1), 25–34. <https://doi.org/10.31291/jke.v12i1.100>
- P. M. Romer, "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, vol. 94, no. 5, 1986, <https://doi.org/10.1086/261420>
- Putri, D. H. Z., & Pamjawa, J. L. (2022). THE EFFECT OF FINANCIAL DEEPENING, FOREIGN DIRECT INVESTMENT, AND INTEREST RATES ON ECONOMIC GROWTH IN INDONESIA. *JOURNAL OF MANAGEMENT, ACCOUNTING, GENERAL FINANCE AND INTERNATIONAL ECONOMIC*, 1. <https://ojs.transpublika.com/index.php/MARGINAL/>
- SALAMI, L. A., & TORIOLA, A. K. (2021). MONETARY POLICY SHOCKS AND ECONOMIC GROWTH IN NIGERIA. *Journal of Public Administration, Finance and Law*, 22. <https://doi.org/10.47743/jopafll-2021-22-17>
- Wibowo, A. (2015). Pengaruh perubahan BI Rate terhadap pertumbuhan ekonomi dan inflasi di Indonesia. *Jurnal Ekonomi dan Bisnis*, 9(2), 134–147.
- W. Asrian, "THE EFFECT OF INVESTMENT, INTEREST RATES AND POVERTY ON ECONOMIC GROWTH IN INDONESIA," 2024. [Online]. Available: <http://ojs.unimal.ac.id/index.php/Jompe>

**Library in the form of book titles:**

- Blinder, A. S. (1998). "Central Banking in Theory and Practice." In *The Lionel Robbins lectures*.
- Ghozali, I. (2011). Aplikasi Analisis Multivariate Dengan Program IBM SPSS 19 (edisi kelima). In *Aplikasi Analisis Multivariate dengan program SPSS* (Issue 1996).
- Mishkin, F. S. (2007). The economics of money, banking, and financial markets. In *Policy*.
- Sugiyono, D. (2010). Metode penelitian kuantitatif kualitatif dan R&D. In *Penerbit Alfabeta*.
- Widarjono, A. (2005). Ekonometrika : Teori dan Aplikasi Untuk Ekonomi dan Bisnis. In *Buku scan*.

**Library in the form of a dissertation / thesis / thesis:**

- Siregar, H., & Wardhani, E. (2012). Analisis hubungan suku bunga acuan terhadap pertumbuhan ekonomi Indonesia. *Buletin Ekonomi Moneter dan Perbankan*, 15(3), 289–312.