

Interest Rates and Money Supply: Implications for Price Stability in Indonesia

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Abstract

This study examines the influence of monetary policy represented by interest rates (BI7DRR) and money supply (M2) on price stability (inflation) in Indonesia from 2015 to 2024 using the Autoregressive Distributed Lag (ARDL) approach. Monthly data from Bank Indonesia and Statistics Indonesia were analyzed using the ARDL. The empirical results indicate that neither interest rates nor money supply have a statistically significant short-term effect on inflation at the 5% level. Inflation dynamics are instead strongly dominated by past inflation, as indicated by the highly significant coefficient of the lagged inflation variable. These findings suggest that short-term inflation in Indonesia is primarily driven by its own persistence rather than by monetary policy instruments. Diagnostic tests confirm that the model satisfies classical assumptions, with no evidence of autocorrelation, heteroscedasticity, or non-normality in the residuals. The results highlight the importance of managing inflation expectations and addressing structural factors beyond monetary aggregates and policy rates for achieving effective price stability in Indonesia.

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Introduction

Monetary policy is a fundamental tool used by central banks to manage inflation and ensure price stability within an economy. In Indonesia, Bank Indonesia's role in shaping the economy through interest rate and money supply management is pivotal in controlling inflationary dynamics. Interest rates, set by Bank Indonesia, directly influence the cost of borrowing, which affects consumption, investment, and overall economic activity (Tirtosuharto & Adiwilaga, 2014).

Monetary policy is the main instrument used by Bank Indonesia to achieve price stability and support sustainable economic growth. One of the main ways this policy is implemented is through the regulation of interest rates and the amount of money in circulation (M2), each of which plays a significant role in controlling inflation. Previous studies have shown that interest rate policy plays an important role in controlling inflation through interest rate channels that affect aggregate demand (Wulandari, 2012). In addition, an increase in the money supply that is not matched by an increase in the production of goods and services can lead to higher inflation, a phenomenon observed in a study by Nguyen (2015). These findings are supported by more recent research on monetary policy in Indonesia, which shows the importance of M2 management for maintaining long-term price stability.

This study aims to analyze the impact of monetary policy, represented by interest rates and money supply, on price stability (inflation) in Indonesia. The focus of this study

is to understand how changes in interest rates and money supply can affect inflation rates in the short and long term. The results of this study are expected to provide deeper insights into the effectiveness of Bank Indonesia's monetary policy in maintaining price stability and controlling inflation.

Method

This study applies a quantitative approach to analyze the effect of monetary policy through interest rates and money supply on price stability in Indonesia. The purpose of this study is to evaluate how effectively monetary policy operates through the interest rate and money channels in influencing inflation dynamics.

Data and Sources

1. The study uses monthly secondary data for the period January 2015 to December 2024.
2. The variables used in this study include:
 - a. Inflation rate (Y) obtained from Bank Indonesia's SEKI website, accessed on September 29, 2025.
 - b. Interest rate (X_1) represented by the Bank Indonesia policy rate (BI7DRR) from SEKI, accessed on September 29, 2025.
 - c. Money supply (X_2) represented by M2 obtained from the Central Bureau of Statistics (BPS), accessed on September 30, 2025.

All data are transformed into logarithmic form when necessary to stabilize variance and make the interpretation of elasticity clearer. Data processing and estimation are carried out using EViews 12 software.

Model Specification

In this study, the Autoregressive Distributed Lag (ARDL) model is employed to analyze the effect of interest rates and money supply on inflation in Indonesia. The ARDL framework is appropriate because it allows the modeling of dynamic relationships among variables that may be integrated of different orders ($I(0)$ or $I(1)$), and it provides flexible lag structures capable of capturing short-term adjustments as well as long-term equilibrium dynamics.

The general ARDL model estimated in this study can be expressed as follows:

$$\Delta INF_t = \alpha + \sum_{i=1}^q \beta_{1i} \Delta INF_{t-i} + \sum_{i=0}^q \beta_{2i} \Delta IR_{t-i} + \sum_{k=0}^m \beta_{3k} \Delta M2_{t-k} + \gamma_1 INF_{t-1} + \gamma_2 IR_{t-1} + \gamma_3 M2_{t-1} + \epsilon_t$$

Where:

INF_t = Inflation rate at time t (proxy for price stability).

IR_t = Interest rate at time t (BI Rate).

$M2_t$ = Money supply at time t , logarithmically scaled.

Δ = First difference or change in the variable.

P, q, m = Lag length for inflation (INF), interest rate (IR), and money supply (M2).

α = Model constant.

$\gamma_1, \gamma_2, \gamma_3$ = Long-term coefficients for variables INF, IR, and M2.

ε_t = Residual error term.

The ARDL model structure allows the estimation of short-run dynamics through the differenced terms and long-run relationships through the lagged-level variables. In this study, the optimal lag structure selected using the Akaike Information Criterion (AIC) results in an ARDL(1,1,0) specification.

Estimation and Diagnostic Testing

The estimation of the ARDL model is carried out using Ordinary Least Squares (OLS) after determining the optimal lag selection based on the Akaike Information Criterion (AIC). Prior to estimation, unit root tests are conducted using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) procedures to ensure that none of the variables is integrated of order two, which would invalidate the ARDL approach. The variables used in the model are found to be a mixture of I(0) and I(1), making the ARDL technique appropriate.

Following model estimation, several diagnostic tests are performed to evaluate model adequacy. The Breusch–Godfrey Serial Correlation LM test indicates no evidence of autocorrelation, as shown by a probability value of 0.6904. The Breusch–Pagan–Godfrey test confirms that the model residuals are homoscedastic, with a probability of 0.9947. Additionally, the Jarque–Bera normality test yields a probability of 0.224804, demonstrating that the residuals are normally distributed.

These diagnostic results collectively confirm that the model satisfies the classical linear regression assumptions, and thus the estimated coefficients can be interpreted reliably.

Research Hypothesis

This study examines the effect of interest rates and money supply on inflation in Indonesia, both in the short and long term.

H_0 (Null Hypothesis): Interest rates and money supply do not have a significant effect on inflation in Indonesia in either the short run or the long run.

H_1 (Alternative Hypothesis): Interest rates and money supply have a significant effect on inflation in Indonesia in either the short run or the long run.

The hypotheses guide the empirical evaluation of monetary policy effectiveness in maintaining price stability in Indonesia.

Result and Discussion

Regression Results

The ARDL (1,1,0) estimation results show that the lagged inflation variable (LN_INF(-1)) has a strong and statistically significant effect on current inflation, with a coefficient of 0.974306 ($p = 0.0000$). This indicates substantial inflation inertia in Indonesia, meaning past inflation plays a dominant role in shaping current inflation.

Table 1: ARDL Regression Results (Main Model)

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LN_INF(-1)	0.974306	0.033336	29.22681	0.0000
LN_BI	0.400398	0.303907	1.320224	0.1894
LN_BI(-1)	-0.500831	0.292650	-1.711365	0.0897
LN_M2	-0.051868	0.051169	-1.013656	0.3129
C	0.992243	0.818161	1.212773	0.2277

In contrast, both the contemporaneous interest rate (LN_BI) and its lag do not exhibit statistical significance at the 5% level ($p = 0.1894$ and $p = 0.0897$, respectively). Therefore, the model does not provide evidence that short-term fluctuations in Bank Indonesia's policy rate significantly influence inflation in the sample period.

Similarly, the money supply variable (LN_M2) has a negative coefficient (-0.051868) but is statistically insignificant ($p = 0.3129$), indicating that changes in M2 do not have a detectable short-term impact on inflation.

Tabel 2: Goodness of Fit Model

Indicator	Value
R-squared	0.935759
Adjusted R-squared	0.933505
Durbin-Watson stat	1.847848

The model achieves a high explanatory power with an R-squared of 0.935759, suggesting that approximately 93.58% of the variation in inflation can be explained by the included variables, predominantly through inflation inertia. The Durbin-Watson statistic of 1.847848 indicates no autocorrelation problems.

Diagnostic Tests

To ensure the robustness of the ARDL model, several diagnostic tests were conducted, including tests for normality, autocorrelation, and heteroscedasticity. Autocorrelation Test, The results of the Breusch-Godfrey Serial Correlation LM indicate that there is no autocorrelation up to 2 lags with an F-statistic of 0.371782 and a

probability of 0.6904, which shows that the residuals do not exhibit autocorrelation, further strengthening the validity of the model.

Table 3: Diagnostic Test Results

Diagnose model	Statistic	Probability
Autocorrelation (Breusch-Godfrey)	0.371782	0.6904
Heteroscedasticity (Breusch-Pagan-Godfrey)	0.052828	0.9947
Normality (Jarque-Bera)	2.985050	0.2248

Heteroscedasticity Test, The Breusch-Pagan-Godfrey results show an F-statistic of 0.052828 with a probability of 0.9947, indicating that the assumption of homoscedasticity is maintained, i.e., the residual variance remains constant over time. Normality Test, The Jarque-Bera test results show a probability of 0.224804, indicating that the residuals are normally distributed, confirming that the model satisfies the normality assumption.

Discussion

The findings of this study indicate that inflation in Indonesia is predominantly driven by its own past values, reflecting strong inflation inertia. This persistence suggests that once inflationary pressures emerge, they tend to be sustained over time, consistent with an environment in which price expectations adjust gradually. The insignificance of the policy interest rate (BI7DRR) and the money supply (M2) in the estimated ARDL model implies that conventional monetary policy instruments do not exert an immediate, statistically detectable impact on inflation within the monthly horizon examined in this research. In other words, short-term fluctuations in interest rates and liquidity conditions are not sufficient, by themselves, to alter inflation dynamics in the short run.

Several structural features of the Indonesian economy may explain this weak short-term transmission of monetary policy. First, slow interest-rate pass-through, driven by rigid loan contracts and relatively high intermediation margins in the banking sector, can delay the effect of policy rate changes on borrowing costs and aggregate demand. Second, the role of administered prices such as fuel, electricity, and key food items reduces the sensitivity of headline inflation to interest-rate movements, as these prices are often determined by government decisions rather than market forces. Third, expansions in liquidity may be absorbed by the financial system or used to finance portfolio and investment activities rather than directly stimulating consumption, thereby weakening the link between money supply and consumer prices. Finally, external shocks, particularly fluctuations in global commodity prices and exchange-rate volatility, can dominate domestic price dynamics and overshadow the impact of domestic monetary policy. Taken together, these results suggest that monetary policy alone is insufficient for effective short-term inflation control in Indonesia and must be complemented by robust expectation management and broader structural reforms aimed at enhancing the responsiveness of prices and markets to policy signals.

Policy and Implication

In light of these findings, several policy recommendations emerge. First, Bank Indonesia should strengthen inflation expectation management through clear communication strategies and credible forward guidance, given the important role of inflation persistence. Second, efforts are needed to enhance the effectiveness of the monetary transmission mechanism by reducing credit market frictions and improving the pass-through from policy rates to lending and deposit rates. Third, monetary policy should be complemented by macroprudential and supply-side measures that address structural bottlenecks in production and distribution, thereby mitigating cost-push pressures. Fourth, the authorities should reinforce monitoring and management of external vulnerabilities, particularly those arising from commodity price movements and exchange-rate fluctuations, which can significantly influence domestic inflation. Finally, future research should incorporate additional variables such as the exchange rate, fiscal policy indicators, and global commodity prices to develop a more comprehensive understanding of Indonesia's inflation dynamics and to refine policy design aimed at achieving sustainable price stability.

Conflict Interest: The authors declare no conflict of interest.

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