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The Effectiveness of Monetary Instruments on Inflation from a Sharia Economic Perspective: An Empirical Study of the Money Supply and the BI Rate in Indonesia for the 2015–2024 Period

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ABSTRACT

Inflation is a major challenge in maintaining macroeconomic stability, including from an Islamic economic perspective that emphasizes justice and welfare. This study analyzes the effectiveness of the money supply (M2) and the BI Rate on inflation in Indonesia (2015–2024) using a quantitative approach using multiple linear regression. Time series data is taken from Bank Indonesia and analyzed using t-tests, F-tests, and coefficients of determination. The results show that M2 has a significant negative effect on inflation, indicating that monetary expansion directed at the real sector can stabilize prices. Conversely, the BI Rate has a significant positive effect, indicating the ineffectiveness of conventional interest rates in controlling inflation and the potential to trigger cost-push inflation. These findings strengthen criticism of usury-based instruments and encourage the need to develop sharia-compliant monetary policies oriented towards the productive sector. The implication is that monetary authorities need to reformulate policy instruments that align with Islamic principles, such as profit-sharing instruments, to achieve equitable price stability. This study contributes to the Islamic economics literature by highlighting the dilemma of the dual banking system and the urgency of monetary policy transformation. The limitations of this research lie in the limited number of variables, so further research is recommended to include other factors such as exchange rates and inflation expectations.

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INTRODUCTION

Inflation is one of the main challenges in maintaining sustainable macroeconomic stability, both in conventional and Islamic economic systems. In Islamic economics, price stability is part of the objectives of sharia (maqasid al-shariah), particularly in maintaining the welfare of the people through the protection of wealth (hifzh al-mal) and social welfare (Tiaranissa & Fitriah, 2025). Uncontrolled inflation has the potential to damage distributional justice, erode the purchasing power of low-income communities, and create economic inequality. (Artati et al., 2025). Therefore, from an Islamic perspective, monetary policy must be directed towards maintaining price stability while upholding the principles of justice and economic blessings.

Based on Bank Indonesia time series data, Indonesian inflation exhibits a fluctuating pattern responsive to monetary policy. In the 2020-2021 period, inflation reached its lowest point (1.32%-1.87%) in line with the BI Rate cut to 3.5% and the expansion of the money supply (M2) to IDR 7,870 trillion. However, global and domestic inflationary pressures pushed inflation to 5.95% in September 2022, to which

Bank Indonesia responded by gradually raising the BI Rate from 3.5% (early 2022) to 6.3% (mid-2024). This policy proved effective in reducing inflation to the range of 1.55%-3.05% in 2024, even though the money supply continued to increase to IDR 9,246 trillion. This phenomenon highlights the sharia dilemma: on the one hand, conventional interest rate instruments appear effective in controlling inflation; on the other hand, they contradict the principle of the prohibition of usury (riba). This empirical data highlights the urgency of developing competitive sharia monetary instruments, particularly within the framework of Indonesia's dual banking system (Bank Indonesia, 2024).

A number of previous studies have explored the influence of monetary instruments on inflation, such as that conducted by Ariza (2024), which analyzes the interaction of monetary instruments in aggregate until mid-2024, has not yet outlined the specific contribution of each instrument, particularly the money supply (M2) and the BI Rate. On the other hand, Mariska et al., (2024) focused their research on the relationship between money supply, interest rates, and inflation, but did not explicitly evaluate the role of the BI Rate as a sharia monetary instrument Meanwhile, a study by Rusanti et al., (2024) compared the effectiveness of conventional and sharia monetary instruments in controlling inflation, but the results showed a relatively small contribution of sharia instruments and did not include a comprehensive analysis of the BI Rate or M2. Another study by Imam & Karfin (2023) did involve the BI Rate and money supply variables, but in the context of the outstanding value of corporate sukuk, not in relation to inflation in general.

Empirical studies that comprehensively and simultaneously examine the impact of the BI Rate and the money supply as Islamic monetary instruments on inflation in Indonesia, particularly over the 2015-2024 period, are still very limited. Existing literature indicates that comparative analysis of the effectiveness of conventional monetary instruments, focusing on interest rate mechanisms and Islamic economic principles, remains inadequate, particularly in the Indonesian context. Furthermore, the use of recent data, which encompasses both the pandemic and the post-pandemic economic recovery phase, has not been optimal. This situation highlights the urgency of re-evaluating the role of the BI Rate and the money supply in influencing inflation, while also assessing their alignment with the Islamic economic paradigm.

This research offers novelty by utilizing the latest data up to 2024 and simultaneously testing two key monetary variables. In addition to providing empirical insight into the effectiveness of monetary policy, this study also provides a critical contribution to the relevance and limitations of conventional instruments in the context of countries developing Islamic financial systems. Therefore, the research findings are expected to serve as a reference in formulating more inclusive monetary policies based on Islamic values.

This study aims to analyze and test the effectiveness of the money supply and BI interest rates on inflation in Indonesia during the 2015–2024 period. Furthermore, this study also serves as a critical reflection on the need for reformulation of monetary instruments in line with Islamic economic principles in an effort to achieve fair and sustainable macroeconomic stability.

RESEARCH METHODS

This study uses a positivistic paradigm with a quantitative approach to examine the causal relationship between the money supply (X1) and the BI Rate (X2) on inflation (Y) in Indonesia. This study uses a causal approach, aiming to analyze the influence of both independent variables on the dependent variable.

The data used is secondary data in the form of a monthly time series for the period January 2014 to December 2024, with 120 observations. The data source was obtained from the official publication of the Indonesian Economic and Financial Statistics (SEKI) published by Bank Indonesia on the website www.bi.go.id. Data collection techniques were conducted through documentation and literature review.

Data analysis included descriptive analysis, classical assumption tests (normality, heteroscedasticity, multicollinearity), and multiple linear regression. The F-test and t-test were used to measure the significance of the model and variables, while the coefficient of determination (R^2) was used to determine the influence of the independent variables on inflation. Data processing was performed using statistical software such as SPSS 25.

RESULTS

Descriptive Statistical Test

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Money Supply	120	4174825.91	9246630.11	6468995.1377	1547198.03792
Bi Rate	120	3.50	7.80	5.2725	1.24076
Inflation	120	1.32	7.26	3.3740	1.48118
Valid N (listwise)	120				

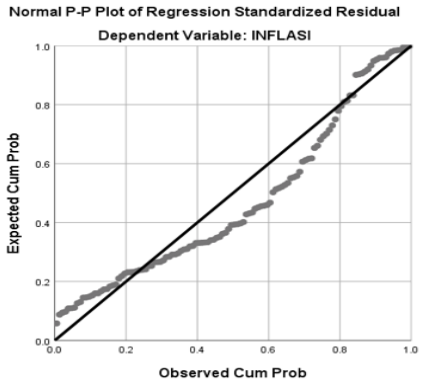
The descriptive statistics table shows the characteristics of each variable studied during the observation period. The money supply had a minimum value of Rp4,174,825.91 billion and a maximum of Rp9,246,630.11 billion, with an average of Rp6,468,995.14 billion and a standard deviation of Rp1,547,198.04 billion, indicating a fairly high level of variation between periods.

The benchmark interest rate (BI Rate) ranged from 3.50% to 7.80%, with an average of 5.27% and a standard deviation of 1.24%, reflecting moderate fluctuations during the observation period.
Meanwhile, the inflation rate ranged from 1.32% to 7.26%, with an average of 3.37% and a standard deviation of 1.48%, indicating relatively stable but significant inflation variation over time. All 120 valid observations were analyzed.

Classical Assumption Test

Normality Test

The normality test is performed using a Probability Plot (P-P Plot). The data distribution is considered normal if the points follow a diagonal line, as shown in the following figure.



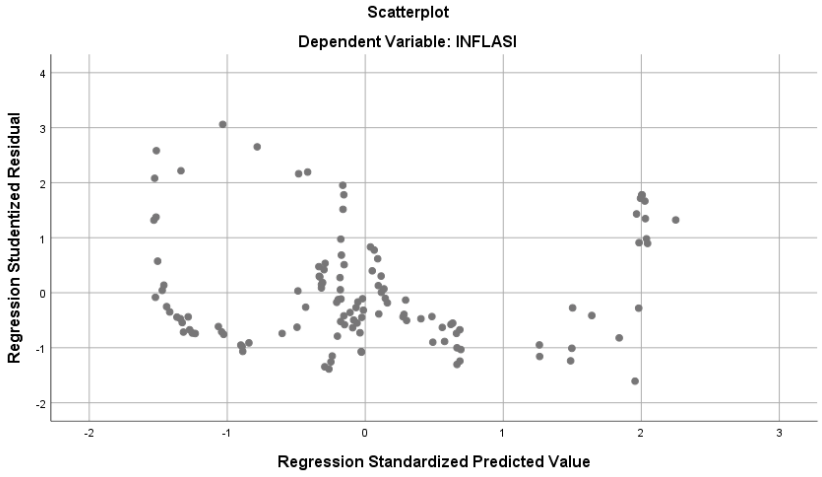
Source: SPSS 2025 Data Processing Results

Figure 1. Normality Test

Based on the P-P plot results, the residual points are distributed close to the diagonal line, indicating that the residuals of the regression model meet the normality assumption. Thus, the data can be said to be normally distributed.

Heteroscedasticity Test

The heteroscedasticity test is performed by visualizing a scatterplot of residuals versus predicted values. The results are presented in the following figure.



Source: SPSS 2025 Data Processing Results

Figure 2. Heteroscedasticity Test

The scatterplot shows a random distribution of residuals and no specific pattern around the predicted values, indicating the absence of heteroscedasticity. Thus, the assumption of homoscedasticity is met.

Multicollinearity Test

The multicollinearity test was conducted by analyzing the Tolerance and Variance Inflation Factor (VIF) values. The test results are presented in the following table.

Table 2. Multicollinearity Test

Coefficients[a]			
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Money In Circulation	0.923	1.083
	Bi Rate	0.923	1.083

a. Dependent Variable: Inflation

Source: SPSS 2025 Data Processing Results

Based on the analysis results, the tolerance value for the MONEY SUPPLY and BI RATE variables was 0.923 (>0.10), respectively, and the VIF value was 1.083 (<10). This indicates the absence of multicollinearity in the model.

Multiple Linear Regression Test

Based on the results of data processing using SPSS 25 for Windows, the results of multiple regression analysis were obtained as follows.

Table 3. Multiple Linear Regression

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.882	0.757		2.487	0.014
	Money In Circulation	-2.537E-07	0.000	-0.265	-3.530	0.001
	Bi Rate	0.594	0.090	0.498	6.631	0.000

a. Dependent Variable: Inflation

Source: SPSS 2025 Data Processing Results

The multiple linear regression equation is obtained as follows:

$Y = 1{,}882 - 2{,}537E\text{-}07X_1 + 0{,}594X_2$

(with Y = Inflation; X_1 = Money Supply; X_2 = BI Rate)

The equation shows that:

a) The positive constant (1.882) is significant at 0.014, indicating that when the money supply and BI rate are both zero, the baseline inflation rate is 1.882.
b) The coefficient for money supply (-2.537E-07) is negative and significant (p=0.001). This indicates that every one-unit increase in money supply will reduce inflation by 0.0000002537 (a very small effect), assuming other variables remain constant.
c) The coefficient for the BI rate (0.594) is positive and significant (p<0.001). This means that every one-point increase in the BI rate will increase inflation by 0.594, ceteris paribus (assuming other variables remain constant).

Hypothesis Testing

T-test

Analysis of the Influence of Money Supply on Inflation

The results of the regression analysis indicate that the Money Supply variable has a negative and significant effect on inflation. This is evidenced by the calculated T-value of -3.530, which exceeds the critical T-table value (1.980), and the significance level of 0.001, which is far below the α level of 0.05. The standardized coefficient (β) of -0.265 indicates that each one-unit increase in the Money Supply will reduce the inflation rate by 0.0000002537 units, assuming other variables remain constant. Therefore, it can be concluded that the Money Supply contributes a negative 26.5% to the change in the inflation rate in this model.

Analysis of the Influence of the BI Rate on Inflation

The results of the regression analysis indicate that the BI Rate has a positive and significant effect on inflation. This is evidenced by the calculated t-value of 6.631, which far exceeds the critical t-table value (1.980) and a significance level of 0.000, which is smaller than the α level of 0.05. The standardized coefficient (β) of 0.498 indicates that every one-point increase in the BI Rate will increase the inflation rate by 0.594 units, assuming other variables remain constant. Thus, it can be concluded that the BI Rate provides the largest positive contribution compared to other variables, namely 49.8% to changes in the inflation rate in this model.

F-test

To test the significance of the influence of all independent variables simultaneously on the dependent variable, a simultaneous F-test was conducted using ANOVA analysis. The results are presented below.

Table 4. F-Test Results

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	102.149	2	51.074	37.601	.000[b]
	Residual	158.923	117	1.358		
	Total	261.072	119			

a. Dependent Variable: Inflation

b. Predictors: (Constant), BI Rate, Money Supply

Source: SPSS 2025 Data Processing Results

Based on the results of the ANOVA (Analysis of Variance) test, the calculated F value was 37.601 > F table 3.07 with a significance value of 0.000, which is smaller than α = 0.05. This indicates that the Money Supply and BI Rate variables simultaneously have a significant effect on inflation.

Coefficient of Determination

The coefficient of determination (R^2) analysis was conducted to measure the proportion of variation in the dependent variable (Y) that can be explained by the independent variables (X) collectively. Based on data processing using SPSS 25 for Windows, the following results were obtained:

Table 5. Coefficient of Determination

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.626[a]	0.391	0.381	1.16547

a. Predictors: (Constant), BI Rate, Money Supply

b. Dependent Variable: Inflation

Source: SPSS 2025 Data Processing Results

Based on the statistical output, the R value was 0.626 and R Square (R^2) was 0.391, indicating that 39.1% of the variation in inflation can be explained by changes in the independent variables (Money Supply and BI Rate) together. Meanwhile, the remaining 60.9% is influenced by factors outside the model.

The Adjusted R Square value of 0.381, taking into account corrections for the number of independent variables, demonstrates model consistency despite the adjustments. The Standard Error of the Estimate (1.16547) reflects the average deviation between predicted and actual inflation values, which is relatively low, indicating good model accuracy.

DISCUSSION

The Effect of Money Supply on Inflation

The results of the study indicate that the money supply has a negative and significant effect on inflation, meaning that an increase in the money supply actually lowers the inflation rate. This finding contradicts the classical quantity theory of money, which states that an increase in the money supply, ceteris

paribus, will increase the price level (Ekanayake & Dissanayake, 2025). However, in the context of Islamic economics, the role of money is not merely as a commodity, but as a medium of exchange which must reflect real growth (Ihsan, 2023).

Islamic economics emphasizes balance between the monetary and real sectors. If the increase in the money supply is balanced by growth in the real sector (the production of halal goods and services), inflation can be controlled or even reduced. This is in line with the view of Juhro et al., (2025) which states that inflation in an Islamic economic system can be prevented if money is created based on the needs of the real sector and not for speculative purposes. Therefore, these results can be interpreted as an indication that the monetary expansion that occurred during the observation period was directed toward the productive and consumption sectors in accordance with sharia principles.

The results of this study confirm that, within the framework of Islamic economics, the negative correlation between the money supply and inflation reflects the effectiveness of monetary expansion directed at the real sector and productive economic activities in accordance with Sharia principles. This finding provides evidence that money creation, not based on speculative motives, but rather on real transaction needs, can suppress inflationary pressures. In other words, an increase in the money supply is not always synonymous with price increases, as long as such growth is accompanied by a tangible increase in the output of halal goods and services. This argument also strengthens the view that a value- and justice-based Islamic financial system can create price stability through the integration of the monetary and real sectors.

The Effect of the BI Rate on Inflation

The finding that the BI Rate has a positive and significant effect on inflation raises important debate, given that theoretically, interest rate policy is typically implemented to suppress inflation. In conventional economics, an increase in the benchmark interest rate is expected to reduce aggregate demand and curb inflation (Syifatul Husna, 2024). However, these results indicate the opposite: an increase in the BI Rate is actually correlated with increased inflation.

From an Islamic economic perspective, the existence of interest rates (riba) itself is considered contrary to the principles of distributive justice and economic equilibrium. The interest system is considered to create distortions, increase production costs (cost-push inflation), and slow the circulation of capital in the real sector (Tetik & Bari, 2022). Therefore, this finding can be explained as a consequence of the dominance of usurious instruments in monetary policy that is out of sync with price stability.

Furthermore, these results align with research by Fikri (2019) which shows that in the context of Indonesia's dual banking system, the benchmark interest rate tends to be less effective as an instrument for controlling inflation. This is due to the differing responses between conventional and Islamic banks to interest rate changes, with Islamic banks exhibiting asynchronous, even opposing, responses under certain economic conditions. This difference in response reflects the asymmetric influence on the real sector, thus limiting the effectiveness of monetary policy transmission. In the Indonesian context, as a country with a dual financial system (conventional and Islamic), the inflationary response to the BI Rate may reflect cost pressures and market expectations that are not always rational.

The results of this study indicate that interest rate increases do not necessarily reduce inflation as conventional theory suggests, but instead increase production costs, leading to higher prices. This effect suggests that interest rate policy can trigger cost-push inflation, rather than suppress it. With the dominance of interest rates in monetary policy, especially in countries with a dual banking system like Indonesia, policy transmission becomes ineffective and tends to create distortions in the real sector.

CONCLUSION

Based on the results of the study, which used multiple linear regression with SPSS on data from 2015–2024, it was found that the money supply (X_1) had a negative and significant effect on inflation (Y), while the BI Rate (X_2) showed a positive and significant effect on inflation. This finding addresses the main research question: conventional monetary policy, particularly through interest rates, is not always effective in suppressing inflation. Conversely, interest rate increases have the potential to increase production costs and encourage cost-push inflation, especially in a dual-banking economy like Indonesia. Conversely, increasing the money supply directed toward the real sector and productive activities can actually help stabilize prices, in accordance with Islamic economic principles.

The results of this study provide important implications for formulating monetary policy that is more aligned with the needs of the real sector and the principle of economic justice. The limitations of this study lie in the limited number of independent variables and the use of a solely quantitative approach. Further research is recommended to explore other variables such as inflation expectations, the exchange rate, or the producer price index, as well as consider qualitative approaches to capture the structural and behavioral dimensions of the economy more comprehensively.

SUGGESTION

Based on the research findings, monetary authorities are advised to evaluate the effectiveness of interest rate instruments in controlling inflation, particularly within the context of Indonesia's dual banking system. Monetary policy needs to be more directed at strengthening the real sector through the development of Islamic monetary instruments based on profit-sharing and productive financing to achieve equitable price stability.

Further researchers are advised to expand the model by adding other macroeconomic variables such as the exchange rate, inflation expectations, and the producer price index, as well as using more diverse approaches and analytical methods to gain a more comprehensive understanding of monetary policy transmission from an Islamic economic perspective.

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