Al-Kharaj: Journal of Islamic Economic and Business
Volume 8 (2), 2026
P-ISSN: 2686-262X; E-ISSN: 2685-9300

Implementation of the ECM Model to Measure Inflation in Indonesia and Its Implications for State Financial Planning

Tazkia Ayu Lutvia [1], M. Irwan [2], Muhamad Bai'ul Hak[3]
[1,2,3] Faculty of Economics and Business, Mataram University, Indonesia
Email Correspondent: tazkiaayulutvia@gmail.com

Keywords: *Inflation, ECM, World Oil Prices, Monetary Policy, Fiscal Policy.*

Abstract

Inflation is an important macroeconomic indicator that reflects price stability and plays a crucial role in national financial planning. Understanding the determinants of inflation is essential for designing effective economic policies, particularly in developing economies such as Indonesia. This study aims to analyze the influence of money supply, exchange rates, interest rates, and world oil prices on inflation in Indonesia. The research employs a quantitative approach using monthly secondary data for the period 2015-2024 obtained from Indonesia Statistics and Bank Central of Indonesia. The analytical method applied is the Error Correction Model (ECM) to examine both short-term dynamics and long-term equilibrium relationships among the variables. The estimation results indicate that in the short term, money supply and world oil prices have a negative but statistically insignificant effect on inflation, while exchange rates and interest rates also show insignificant effects. In the long term, money supply continues to exhibit a negative but insignificant effect, whereas exchange rates, interest rates, and world oil prices have positive but statistically insignificant effects on inflation. These findings suggest that inflation dynamics in Indonesia during the observation period are more strongly influenced by structural and policy-related factors than by the monetary and external variables included in the model.

INTRODUCTION

Inflation is one of the important indicators in the economy that reflects price stability and affects the macroeconomic performance of a country (Yanti & Soebagyo, 2022). Inflation, if too high, can reduce investment levels, decrease public consumption, and undermine confidence in currency stability (Efendi, 2019). On the other hand, stable and low inflation rates can create an environment conducive to investment and economic growth (Sihotang et al., 2024).

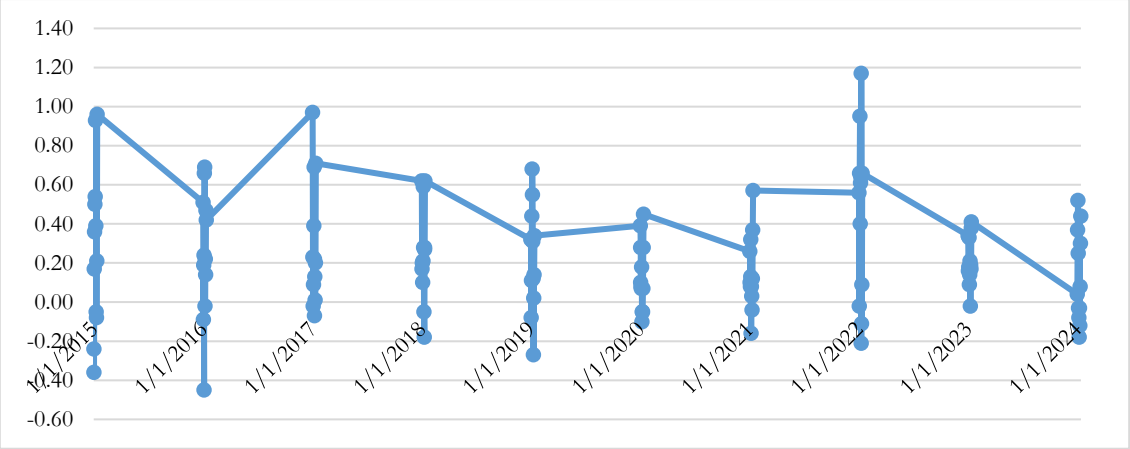

Figure 1. Graph of Monthly Inflation Movement in Indonesia 2015-2024

Based on figure 1, Indonesia's monthly inflation data for the period 2015-2024 (BPS), it shows that although the inflation rate is fluctuating, it remains generally under control. Several months, including January 2015 (-0.24%) and February 2015 (-0.36%), experienced deflation, but the average monthly inflation rate was in the range of 0.3-0.5 percent. On the other hand, changes in fuel prices and increases in global energy prices were the main causes of the inflation peak in September 2022 at 1.17%. This trend shows that although inflation in Indonesia is relatively stable, it remains vulnerable to shocks from both domestic and foreign sources, including changes in the rupiah exchange rate and world oil prices, as well as domestic issues such as government pricing policies and food distribution.

Theoretically, inflation can be explained through the Quantity Theory of Money proposed by Irving Fisher, which is expressed in the equation MV=PT. This theory explains that an increase in the money supply without a corresponding increase in real output will cause an increase in price levels (Fisher, 1913). In addition, the Keynesian framework introduced by John Maynard Keynes explains inflation through the concept of demand-pull inflation, which is a condition where aggregate demand exceeds production capacity, thereby driving up prices (Keynes, 1936). In monetary policy, interest rates serve as an important policy instrument used by Bank Indonesia to regulate liquidity and maintain price stability (Agustin, 2021).

In addition, exchange rates also play an important role in determining inflation dynamics through the exchange rate pass-through mechanism. Currency depreciation can increase the prices of imported goods and raise production costs, which ultimately contributes to an increase in domestic inflation (N. Gregory Mankiw, 2019). On the other hand, global energy prices, such as world oil prices, can also affect inflation through the cost-push inflation mechanism, whereby increases in input costs, especially energy, will increase production costs and ultimately drive up the prices of goods and services (Olivier Blanchard, 2017). These factors show that inflation is not only influenced by domestic monetary variables and the global economy, but also by a country's fiscal conditions (Mahendra et al., 2022). A country's fiscal balance can be put under pressure by high inflation because it can increase energy subsidies, employee spending, and debt interest costs. Therefore, understanding how inflation behaves is crucial for national financial planning and monetary stability. Because this model can explain the short-term and long-term relationship between inflation and macroeconomic factors, including money supply, interest rates, exchange rates, and global oil prices, the Error Correction Model (ECM) approach is used.

Previous studies have shown mixed results. Agustin (2021) used the Error Correction Model (ECM) approach and found that the BI Rate had a significant effect on inflation, while the

money supply and exchange rate were not significant. The research by Marla Pisganda and Muhammad Awaludin (2025) also used ECM and showed that the money supply has a significant negative effect in the short term but is not significant in the long term. Meanwhile, research by Akhyar et al. (2024) shows that interest rates have a positive effect on inflation, money supply has a negative effect on inflation, exchange rates have no effect on inflation, and government spending has a positive effect on inflation. Simultaneously, these four variables affect the current inflation rate in Indonesia. Although many studies have examined the determinants of inflation from a monetary perspective, such as the money supply, interest rates, exchange rates, and global oil prices on inflation, this study is unique. This study focuses on the relationship between inflation and state financial planning, particularly in relation to the macroeconomic assumptions used in the preparation of the State Budget Draft (RAPBN).

Based on this background, this study aims to analyze the application of the Error Correction Model (ECM) in measuring and understanding inflation behavior in Indonesia during the period 2015-2024. This study seeks to answer how the short-term and long-term relationships between macroeconomic variables such as money supply, interest rates, exchange rates, and world oil prices affect inflation, and how the results may have implications for state financial planning, particularly in the preparation of basic macroeconomic assumptions for the Draft State Budget (RAPBN). It is hoped that this study will theoretically strengthen the hypothesis of inflation due to price increases and contribute to the development of knowledge about the factors that influence inflation in developing countries. In practical terms, the findings of this study are expected to assist the government, especially the Ministry of Finance and Bank Indonesia, in formulating more prudent fiscal and monetary policies to maintain price stability and the country's financial sustainability. Therefore, this study aims to analyze the effect of money supply, exchange rates, interest rates, and world oil prices on inflation in Indonesia, both in the short and long term, using the Error Correction Model (ECM) approach.

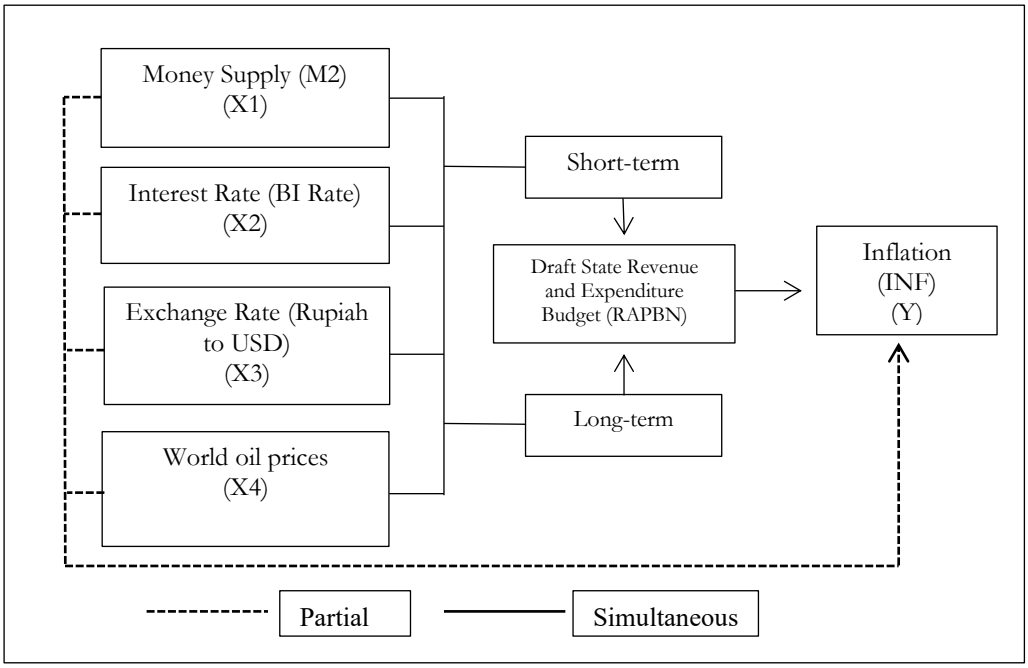

Figure 2. Research Framework

Hypothesis

Based on the theoretical framework and previous research results, the hypothesis in this study is formulated as follows:

1. Partial Hypothesis (Short Term and Long Term)
   - In the short term, the amount of money in circulation, exchange rates, interest rates, and global oil prices are thought to affect inflation in Indonesia.
   - In the long term, the amount of money in circulation, exchange rates, interest rates, and world oil prices are thought to affect inflation in Indonesia.
2. Statistical Hypothesis

t-test (Partial)

- H_0: There is no significant effect between each independent variables (Money Supply (M2), Interest Rates (IR), Exchange Rates (ER) and Oil Prices (OIL)) on inflation.
- H_1: There is a significant effect between each independent variables (Money Supply (M2), Interest Rates (IR), Exchange Rates (ER) and Oil Prices (OIL)) on inflation.

F-test (Simultaneous)

- H_0: Money Supply (M2), Interest Rates (IR), Exchange Rates (ER) and Oil Prices (OIL) have no significant effect on inflation simultaneously in Indonesia.
- H_1: Money Supply (M2), Interest Rates (IR), Exchange Rates (ER) and Oil Prices (OIL) have significant effect on inflation simultaneously in Indonesia.

METHODS

To analyze the effect of money supply, exchange rates, interest rates, and international oil prices on inflation in Indonesia from 2015 to 2024 in the short and long term, this study uses monthly secondary data from the Indonesia Statistics (BPS) and Bank Indonesia (BI) for the period 2015-2024. The data used includes inflation, money supply, interest rates, the exchange rate of the rupiah against the US dollar, and world oil prices, using the Engle-Grager Error Correction Model (ECM) approach. This model is used to estimate the short-term and long-term effects of independent variables on dependent variables. y capturing both immediate macroeconomic shocks and their gradual long-term corrections, this model provides a highly realistic picture of fiscal volatility. Such foresight is particularly crucial for state financial planners, who must carefully balance emergency monetary responses with the consistent, uninterrupted funding required for sustainable development initiatives. The econometric model used in this study is as follows:

$$\Delta INF_t = \alpha + \beta 1 \Delta M2_t + \beta 2 \Delta IR_t + \beta 3 \Delta ER_t + \beta 4 \Delta OIL_t + \beta 5 ECT_{t-1} + \varepsilon_t$$

Notes:

ΔINFt : Change in inflation during period t (%)
ΔM2t : Change in money supply (Billions of rupiah)
ΔIRt : Changes in the exchange rate of the rupiah against the USD (IDR/USD)
ΔER : Changes in Bank Indonesia's benchmark interest rate (%)
ΔOILt : Changes in world oil prices (USD/Barrel)
ECTt-1 : Error Correction Term indicating deviation from the previous period's long-term equilibrium
εt : Error term

Data analysis can be performed using the Error Correction Model (ECM) with the Engle-Grager approach. The analysis begins with a stationarity test using Augmented Dickey-Fuller (ADF) to ensure that all variables are stationary at the first difference level (I(1)). Next, a cointegration test is performed to ensure that all variables are stationary at the first difference level (I(1)). Subsequently, an Engle-Grager cointegration test is performed to see if there is a long-term relationship between the variables under study. The cointegration test results show that the residuals are stationary, so that an ECM model can be formed and continued. This model was chosen because it is able to explain the short-term relationship between variables through variable changes (Δ), as well as the long-term relationship through the ECT component, which shows the adjustment process towards economic equilibrium. In addition, this study also uses time series data from 2015 to 2024 on a monthly basis.

RESULTS AND DISCUSSION

RESULTS

This analysis was conducted to explain the results of the Error Correction Model (ECM) estimation in examining the effect of money supply, exchange rates, interest rates, and world oil prices on inflation in Indonesia.

Stationarity Test

Before estimating the Error Correction Model (ECM), the first step is to test the stationarity of each variable used. This test is important to ensure that the time series data analyzed does not contain unit roots, which can cause spurious regression (Gujarati, 2009). Therefore, testing was conducted using the Augmented Dickey-Fuller (ADF) method on all research variables, namely inflation (INF), Money Supply (M2), Exchange Rate (ER), Interest Rates (IR), and world oil prices (OIL) for the period 2014-2024. The test results are shown in the following table.

Table 1. Stationarity Test Results

No	Variables	ADF Value	Critical Value	Probability	Stationary
1.	INF	-10.1582	-3.4885	0.0000	1st Difference
2.	M2	-15.2422	-3.4865	0.0000	1st Difference
3.	IR	-10.1416	-3.4875	0.0000	1st Difference
4.	ER	-4.6189	-3.4875	0.0002	1st Difference
5.	OIL	-9.8040	-3.4865	0.0000	1st Difference

Source: Data processed with E-views 12, 2026

Based on table 1, the ADF test results show that all variables have statistical values that are more negative than the critical value and a p-value of 0.0000, so the null hypothesis of a unit root is rejected. This means that all variables become stationary after first difference. Since the variables are stationary at that level, the next step is to test for cointegration to examine the existence of a long-term equilibrium relationship. Referring to Engle & Granger (1987), if the residuals from the linear combination of variables are stationary, then the variables are cointegrated and the Error Correction Model (ECM) is appropriate for explaining short-term and long-term dynamics.

Cointegration Test

After all research variables are declared stationary at the first difference level, the next step is to conduct a cointegration test to identify whether or not there is a long-term relationship between the macroeconomic variables under study. This test aims to ensure that even though variables such as inflation, money supply, exchange rates, interest rates, and oil prices are individually non-stationary at the level, their linear combination can move together in the long run toward a stable equilibrium (Johansen, 1988). Thus, the results of the cointegration test will form the basis for the formation of an Error Correction Model (ECM) that can describe the dynamics of short-term adjustments to this long-term equilibrium.

Table 2. Cointegration test

No	Variable	ADF Value	Critical Value	Probability	Stationary
1	Residual	-8.8377	-3.4885	0.0000	Level

Source: Data processed with E-views 12, 2026

Based on table 2, the cointegration test results shows that the ADF value of -8.8377 is more negative than the critical value of -3.4885 at a 5% level with a probability of 0.0000 (< 0.05), so the null hypothesis of a unit root in the residuals is rejected. This indicates that the long-term regression residuals are stationary at the level, so it can be concluded that there is a cointegration relationship between inflation, money supply, exchange rate, interest rates, and world oil prices during the 2015-2024 period. Because these variables are cointegrated, further estimation uses the Error Correction Model (ECM). According to Walter Enders (2015), when variables are not stationary at the level but have a cointegration relationship, ECM is the appropriate approach to capture the dynamics of short-term adjustments towards long-term equilibrium. Therefore, the following analysis presents long-term estimates and short-term dynamics that show the direction, strength of influence, and speed of adjustment towards equilibrium.

Short-term model

Table 3. Short-term estimation results

Variable(s)	Coefficient	Std. Eror	t-statistics	Probability
LOG(M2)	-0.55489	0.140342	-0.395382	0.6933
LOG(ER)	0.22025	0.078172	0.281749	0.7787
D(IR)	0.188231	0.181944	1.034556	0.3031
LOG(OIL)	-0.29413	0.115921	-0.253738	0.8002
ECM(-1	-0.774503	0.090353	-8.571959	0.0000

Source: Data processed with E-views 12, 2026

Based on table 2, the results of the Error Correction Model (ECM) estimation in Table 3, it can be seen that the short-term relationship between the independent variables and the dependent variable shows a dynamic adjustment towards long-term equilibrium. The money supply (M2) variable has a negative coefficient of -0.55489 with a probability of 0.6933, which means it is not statistically significant at the α=5% level. This indicates that short-term changes in the money supply (M2) have not had a significant effect on the dependent variable in that period. Furthermore, the Exchange Rate variable has a positive coefficient of 0.22025 with a probability of 0.7787, which is also insignificant, indicating that exchange rate fluctuations have not had a direct effect on changes in the dependent variable in the short term. The Interest Rate (IR) variable

has a positive coefficient of 0.188231 with a probability value of 0.3031, indicating a positive but statistically insignificant effect. Thus, changes in interest rates have not been able to have a real effect on inflation in the short term. The oil variable has a negative coefficient of -0.29413 with a probability of 0.8002, indicating that fluctuations in world oil prices have not had a significant effect in the short term.

Meanwhile, the EC (-1) coefficient of -0.774503 is significant at the 1% level (p = 0.0000), in line with the theory that negative and significant values indicate the existence of a valid error correction mechanism. This value means that approximately 77.45% of short-term imbalances will be corrected towards long-term equilibrium in the next period. Thus, this ECM model shows that although most variables are not significant in the short term, there is a strong adjustment process towards long-term equilibrium. Thus, these short-term estimation results indicate that although macroeconomic variables (money supply, exchange rates, interest rates, and world oil prices) do not have a significant effect on inflation in the short term, there is a strong adjustment process towards long-term equilibrium as indicated by the significant ECM(-1) coefficient.

Long-term model

Table 4. Long-term estimation results

Variable(s)	Coefficient	Std. Eror	t-statistics	Probability
C	1.1687	6.0688	0.1925	0.8476
LOGM2	-0.0763	0.1858	-0.4109	0.6819
LOGER	0.1527	0.0783	1.950766	0.0535
IR	0.0046	0.0285	0.1634	0.8705
LOGOIL	0.0155	0.13732	0.1129	0.9103
R-squared				0.9796
F-statistic				0.033

Source: Data processed with E-views 12, 2026

Based on table 4, the results of the long-term model estimation presented in Table 4 show that all independent variables, namely money supply, exchange rate, interest rates, and world oil prices, do not have a significant effect on inflation in Indonesia at a significance level of 5%, because all probability values are greater than 0.05. Specifically, the coefficient for money supply of 0.055489 indicates that an increase in money supply tends to reduce inflation in the long term, although the effect is not statistically significant. The exchange rate variable also has a positive coefficient of 0.022025, with a probability value of 0.7787, indicating that changes in the exchange rate of the rupiah against the US dollar have not had a significant effect on inflation in the long term.

Meanwhile, interest rates have a positive coefficient of 0.188231 with a probability value of 0.3031, indicating that an increase in interest rates tends to increase inflation, but the effect is not statistically significant. Meanwhile, world oil prices have a negative coefficient of -0.029413 with a probability value of 0.8002, indicating that fluctuations in world oil prices have not had a significant effect on inflation in the long term. The R-squared value of 0.033 indicates that the variation in inflation that can be explained by the four variables is only around 3.3%, while the F-statistic of 0.9796 indicates that the model as a whole is not yet significant at the 5% level. Thus, these results show that in the long term, inflation dynamics in Indonesia during the 2015-2024 period are not fully explained by the monetary and external factors tested, possibly due to other

structural factors such as inflation expectations, fiscal policy, and domestic supply factors that also affect price stability (Mishkin & Eakins, 2019).

DISCUSSION

The results of the Error Correction Model (ECM) estimation show that the variables of money supply (M2), exchange rate (ER), interest rates (IR), and world oil prices (OIL) have both short-term and long-term relationships with inflation in Indonesia during the period 2015-2024. Theoretically, these findings can be explained through the Quantity Theory of Money introduced by Irving Fisher, which states that an increase in the money supply will lead to a proportional increase in the general price level if the velocity of money and real output remain constant. This relationship is expressed in the equation MV=PT, which implies that changes in the money supply can directly affect inflation dynamics (Fisher, 1911; Milton Friedman, 1970). In the long run, the relationship between money supply and inflation reflects the role of monetary expansion in influencing price stability. However, the empirical results of this study show that the effect of money supply on inflation is not statistically significant in either the short or long term. This finding is consistent with the research of Marla Pisganidy and Muhammad Awaludiin (2025), who also found that the money supply had a negative effect on inflation. This condition indicates that monetary authorities, particularly Bank Indonesia, may have successfully maintained monetary stability through effective liquidity management and inflation targeting policies.

The exchange rate does not significantly affect inflation in either the short or long term. In theory, exchange rates influence domestic prices through the exchange rate pass-through mechanism, where currency depreciation can increase the price of imported goods and production inputs, thereby raising domestic price levels. This concept is widely discussed in international macroeconomic literature (Taylor, 2000; N. Gregory Mankiw, 2019). However, the insignificant results in this study suggest that the pass-through effect in Indonesia is relatively low. This finding is consistent with the study of Putra and Darma (2020), which found that exchange rate transmission to inflation has weakened due to improved exchange rate stabilization policies and stronger foreign exchange reserves managed by Bank Indonesia. In addition, diversification of import sources and government policies aimed at maintaining price stability may also reduce the impact of exchange rate fluctuations on domestic inflation.

Interest rates show a negative coefficient on inflation but are not statistically significant. According to the Keynesian monetary transmission mechanism introduced by John Maynard Keynes, interest rates are an important policy instrument used by central banks to influence aggregate demand through investment and consumption channels. Higher interest rates tend to reduce borrowing, lower investment, and ultimately decrease inflationary pressures (Keynes, 1936; Olivier Blanchard, 2017). However, the insignificant relationship observed in this study indicates that the transmission of interest rate policy to inflation in Indonesia may occur with a time lag. Furthermore, other non-monetary factors such as supply chain conditions, inflation expectations, and global economic fluctuations may play a more dominant role in influencing price dynamics during the study period.

World oil prices have a positive relationship with inflation, although the effect is not statistically significant. Theoretically, this relationship can be explained through the cost-push inflation theory, which states that increases in production costs particularly energy prices will lead to higher prices of goods and services (Hamilton, 2009; Blanchard, 2017). Oil is a major input in transportation and industrial production, so rising oil prices generally increase production costs

across sectors. However, the relatively weak impact found in this study suggests that the transmission of global oil price shocks to domestic inflation in Indonesia is limited. This may be due to government policies such as energy subsidies and fuel price controls, which help stabilize domestic prices despite fluctuations in global oil markets. Similar findings were reported by Siregar and Ward (2018), who noted that the influence of oil prices on inflation in Indonesia has declined following reforms in energy subsidy policies.

Meanwhile, the error correction term (ECM-1) variable is negative and significant, indicating a strong adjustment mechanism towards long-term equilibrium of 76.45 percent per period. This confirms that although the independent variables do not have a significant direct effect in the short term, there is a stable long-term relationship between money supply, exchange rates, interest rates, and oil prices on inflation. Overall, these findings support the general hypothesis that there is a long-term and short-term relationship between macroeconomic variables and inflation in Indonesia. However, the insignificance of some variables in the short term confirms that monetary policy and global externalities play a complex role in determining national inflation dynamics.

The relatively small R^2 value is not a major problem in this study. This is common in macroeconomic time series models because inflation dynamics are often influenced by many external factors outside the model, such as fiscal policy, political conditions, and global commodity prices. The insignificance of monetary variables in the short term may be due to a time lag in the transmission of monetary policy in Indonesia. This means that the impact of changes in money supply, exchange rates, and interest rates on inflation does not occur immediately in the same period, but rather takes a certain amount of time to affect the general price level.

CONCLUSION

Based on the results of analysis using the Engle and Granger Error Correction Model (ECM) on monthly data for the period 2015–2024, it can be concluded that in the short term, the amount of money in circulation, exchange rates, interest rates, and world oil prices do not have a significant effect on inflation. However, the significant Error Correction Term (ECT) indicates a strong adjustment mechanism, whereby inflation imbalances will be corrected in the following period. In the long term, all independent variables also have no significant effect. This indicates that inflation dynamics are more influenced by factors outside the model, such as fiscal policy, political stability, and global energy price conditions and volatility. The implication is that monetary and fiscal policy synergy is needed to maintain price stability and support national financial planning.

The implications that the policymakers need to strengthen coordination between Bank Indonesia and the government in controlling inflation, including more efficient management of energy subsidies. Further research should add variables such as unemployment, minimum wages, economic growth, and fiscal instruments to make the model more comprehensive, and consider using alternative approaches such as Autoregressive Distributed Lag (ARDL) or Vector Error Correction Model (VECM) to capture broader dynamic relationships. For economic practitioners, these results confirm that the impact of monetary policy on inflation is not always immediately apparent in the short term, but plays an important role in long-term adjustments towards economic equilibrium.

To conclude, building a resilient state financial plan requires much more than simply reacting to monthly inflation data; it demands proactive structural shifts. By addressing the root

causes of macroeconomic volatility that Indonesia can secure the fiscal stability it desperately needs. Transitioning away from reactive subsidy mechanisms toward proactive green investments will be the defining factor in achieving the country's long-term sustainable development goals.

REFERENCE

Agustin, D. P. (2021). Analisis Pengaruh Tingkat Kurs dan Suku Bunga Bank Indonesia Dengan Jumlah Uang Beredar, Terhadap Tingkat Inflasi di Indonesia. Develop: Jurnal Ekonomi Pembangunan, 2(1), 33–46.

Akhyar, R. R., Khoiriawati, N., Hidayah, L., Malikah, B. I., & Nur Rohmah, I. L. (2024). Pengaruh Suku Bunga, Jumlah Uang Beredar, Kurs, Dan Pengeluaran Pemerintah Terhadap Inflasi Di Indonesia. *Worldview* (Jurnal Ekonomi Bisnis Dan Sosial Sains), 3(1), 01–10. https://doi.org/10.38156/worldview.v3i1.414

Arindi, S. R., Wijimulawiani, B. S., & Fadlli, M. D. (2025). Peran Infrastruktur Konstruksi Terhadap Ekonomi NTB Dengan Pendekatan Input-Output. Jurnal Ekuilnomi, 7(1), 85–93. https://doi.org/10.36985/qz05cd05

Basit, A. (2020). Pengaruh Harga Emas Dan Minyak Dunia Terhadap Indeks Harga Saham Gabungan (IHSG) Periode 2016-2019. REVENUE: Jurnal Manajemen Bisnis Islam, 1(2), 73–82. https://doi.org/10.24042/revenue.v1i2.6073

BR Silitonga, R., Ishak, Z., & Mukhlis, M. (2019). Pengaruh ekspor, impor, dan inflasi terhadap nilai tukar rupiah di Indonesia. Jurnal Ekonomi Pembangunan, 15(1), 53–59. https://doi.org/10.29259/jep.v15i1.8821

Blanchard, O. (2017). Macroeconomics. Pearson.

Chandra, E. K., & Wahyuningsih, D. (2021). Analisis Pengaruh Suku Bunga, Jumlah Uang Beredar Dan Nilai Tukar Terhadap Inflasi Di Indonesia Periode 2011-2019. Buletin Ekonomika Pembangunan, 2(1).

Efendi, B. (2019). Efektivitas Kebijakan Makroprudensial Terhadap Stabilitas Sistem Keuangan Di Indonesia: Bakhtiar Efendi. Jurnal Kajian Ekonomi Dan Kebijakan Publik (JEpa), 4(2), 72–78.

Enders, W. (2015). Applied econometric time series fourth edition. New York (US): University of Alabama, 30.

Engle, R. F., & Granger, C. W. J. (1987). *Co-integration and error correction: representation, estimation, and testing. Econometrica: Journal of the Econometric Society*, 251–276.

Faizin, M. (2020). Analisis hubungan kurs terhadap inflasi. AKUNTABEL: Jurnal Ekonomi Dan Keuangan, 17(2), 314–319.

Fisher, Irving., (1913). The purchasing power of money, second ed. Macmillan, New York.

Fisher, Irving., (1911). The purchasing power of money: Its determination and relation to credit, interest, and crises. Macmillan.

Friedman, Milton. (1970). A theoretical framework for monetary analysis. *Journal of Political Economy, 78*(2), 193–238.

Gbolahan, K. I. (2023). *An Empirical Investigation of Bitcoin Hedging Capabilities against Inflation using VECM: The Case of United States, Eurozone, Philippines, Ukraine, Canada, India, and Nigeria.* International Journal of Economics and Financial Issues, 13(6), 91–100. https://doi.org/10.32479/ijefi.14956

Gujarati, D. N. (2009). *Basic econometrics. McGraw-Hill.*

Hamilton, J. D. (2009). *Causes and Consequences of the Oil Shock of 2007-08. National Bureau of Economic Research.*

Irving Fisher. (1911). *The Purchasing Power of Money: Its Determination and Relation to Credit, Interest, and Crises*. New York: Macmillan.

John Maynard Keynes. (1936). *The General Theory of Employment, Interest and Money*. London: Macmillan.

Johansen, S. (1988). *Statistical analysis of cointegration vectors. Journal of Economic Dynamics and Control*, 12(2–3), 231–254.

Keynes, J.M., 1936. The general theory of employment, interest and money. Macmillan, London.

Mahendra, A., Amalia, M. M., & Leon, H. (2022). Analisis Pengaruh Suku Bunga, Harga Minyak Dunia, Harga Emas Dunia Terhadap Indeks Harga Saham Gabungan Dengan Inflasi Sebagai Variabel Moderating Di Indonesia. Owner, 6(1), 1069–1082. https://doi.org/10.33395/owner.v6i1.725

Mankiw, N. Gregory. (2019). *Macroeconomics* (10th ed.). Worth Publishers.

Mishkin, F. S., & Eakins, S. G. (2019). *Financial markets. Pearson Italia.*

Pisganidy, Marla., & Awaludiin, Muhammad. (2025). *The effect of money supply on inflation in Indonesia.*

Putra., & Darma. (2020). *Exchange rate pass-through and inflation in Indonesia*

Sihotang, C. A., Efendi, B., & Rangkuty, D. M. (2024). *Analysis of the influence of money supply, interest rates, and exchange rates on inflation in Indonesia. International Journal of Economics, Business and Accounting Research* (IJEBAR), 8(2).

Simanullang, B. (2017). Analisis Pengaruh Kenaikan Harga Minyak Dunia, Jumlah Uang Beredar, Dan Kurs Terhadap Inflasi Di Indonesia. Medan: Repositori Institusi USU.

Susmiati, S., Giri, N. P. R., & Senimantara, N. (2021). Pengaruh Jumlah Uang Beredar dan Nilai Tukar Rupiah (Kurs) Terhadap Tingkat Inflasi di Indonesia Tahun 2011-2018. Warmadewa Economic Development Journal (WEDJ), 4(2), 68–74. https://doi.org/10.22225/wedj.4.2.2021.68-74

Taylor, J. B. (2000). *Low inflation, pass-through, and the pricing power of firms. European Economic Review,* 44(7), 1389–1408.

Yanti, Y. W. T. F., & Soebagyo, D. (2022). Analisis Pengaruh Jub, Suku Bunga, Dan Nilai Tukar Terhadap Inflasi Di Indonesia Tahun 2005-2021. Jurnal Ekonomi Pembangunan STIE Muhammadiyah Palopo, 8(2), 249. https://doi.org/10.35906/jep.v8i2.1256