

THE IMPACT OF GOLD PRICE FLUCTUATIONS ON INDONESIA'S ECONOMIC GROWTH: THE ROLE OF INFLATION, EXCHANGE RATE, AND INVESTMENT

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Abstract: This research analyzes the influence of gold prices on economic growth in Indonesia by incorporating inflation, exchange rates, and investment represented by Gross Fixed Capital Formation (GFCF) as mediating variables. The study employs annual time-series data from 2010–2025 and applies the Autoregressive Distributed Lag (ARDL) model to examine both short-term and long-term relationships among the variables. The findings reveal the existence of a long-run equilibrium relationship between gold prices, inflation, exchange rates, investment, and economic growth. Empirical estimation demonstrates that increases in gold prices negatively and significantly affect economic growth in both the short and long term. This condition indicates that higher gold prices tend to weaken economic performance due to the movement of capital from productive sectors toward safe-haven assets. The results further show that inflation and exchange rate depreciation also exert negative effects on economic growth, whereas investment contributes positively and significantly to economic expansion. In addition, the impact of gold prices on economic growth occurs not only directly but also indirectly through inflation, exchange rates, and investment channels. Among these transmission mechanisms, investment is identified as the most dominant factor. Overall, the study suggests that the macroeconomic effects of gold price fluctuations are structurally transmitted through several economic channels and are strongly influenced by investment behavior in emerging economies such as Indonesia.

Keywords: Gold Price, Economic Growth, ARDL, Inflation, Exchange Rate, Investment

Abstrak: Penelitian ini menganalisis pengaruh harga emas terhadap pertumbuhan ekonomi di Indonesia dengan memasukkan inflasi, nilai tukar, dan investasi yang diprosikan melalui Gross Fixed Capital Formation (GFCF) sebagai variabel mediasi. Penelitian menggunakan data deret waktu (time series) tahunan periode 2010–2025 dan menerapkan model Autoregressive Distributed Lag (ARDL) untuk menguji hubungan jangka pendek maupun jangka panjang antarvariabel. Hasil penelitian menunjukkan adanya hubungan keseimbangan jangka panjang antara harga emas, inflasi, nilai tukar, investasi, dan pertumbuhan ekonomi. Estimasi empiris menunjukkan bahwa kenaikan harga emas berpengaruh negatif dan signifikan terhadap pertumbuhan ekonomi, baik dalam jangka pendek maupun jangka panjang. Kondisi ini mengindikasikan bahwa peningkatan harga emas cenderung melemahkan kinerja perekonomian akibat pergeseran aliran modal dari sektor-sektor produktif menuju aset safe haven. Hasil penelitian juga menunjukkan bahwa inflasi dan depresiasi nilai tukar memberikan pengaruh negatif terhadap pertumbuhan ekonomi, sedangkan investasi berkontribusi positif dan signifikan terhadap ekspansi ekonomi. Selain itu, pengaruh harga emas terhadap pertumbuhan ekonomi tidak hanya terjadi secara langsung, tetapi juga secara tidak langsung melalui jalur inflasi, nilai tukar, dan investasi. Di antara mekanisme transmisi tersebut, investasi diidentifikasi sebagai faktor yang paling dominan. Secara keseluruhan, penelitian ini menunjukkan bahwa dampak makroekonomi dari fluktuasi harga emas ditransmisikan secara struktural melalui beberapa saluran ekonomi dan sangat dipengaruhi oleh perilaku investasi di negara berkembang seperti Indonesia.

Kata kunci: Harga Emas, Pertumbuhan Ekonomi, ARDL, Inflasi, Nilai Tukar, Investasi.

INTRODUCTION

Economic growth is widely recognized as one of the principal indicators used to evaluate a country's economic performance. Besides being shaped by domestic determinants such as consumption and investment, economic growth is also influenced by external factors, including movements in global commodity prices. One of the strategic commodities that significantly affects the international economic system is gold.

According to economic growth theory, the expansion of national output is closely associated with capital accumulation, macroeconomic stability, and efficient resource allocation. In an open economic system, however, external variables such as fluctuations in global commodity prices also contribute to shaping economic performance. Consequently, changes in gold prices may act as an external determinant influencing a country's growth dynamics.

Tabel 1. Harga Emas Dunia (USD/troy ounce) 2010–2025

Tahun	Harga Emas
2010	1,117.70
2011	1,422.60
2012	1,599.70
2013	1,687.90
2014	1,225.00
2015	1,186.00
2016	1,075.10
2017	1,160.40
2018	1,313.70
2019	1,281.00
2020	1,524.50
2021	1,944.70
2022	1,799.40
2023	1,839.70
2024	2,064.40
2025	2,658.90

Source : World Gold Council / Investing / IMF

Gold price developments during the study period showed an upward trend. Significant increases occurred in 2011–2013 and 2020–2025. This indicates that gold serves as a safe haven investment, particularly during times of global economic uncertainty. From the perspective of portfolio theory, rising gold prices reflect investors' preference for safer assets in response to financial instability. This phenomenon may alter investment allocation patterns, which, based on neoclassical growth theory, are essential for sustaining long-term economic growth.

In Indonesia, gold plays a dual role as both an export commodity and a domestic investment asset. On the one hand, increasing gold prices may generate positive effects through higher export earnings and foreign exchange revenues. On the other hand, rising gold prices can encourage investors to transfer

capital from productive sectors into non-productive assets. Such a shift may reduce Gross Fixed Capital Formation (GFCF), which is considered a vital component in enhancing production capacity and economic productivity.

Furthermore, fluctuations in gold prices may also affect other macroeconomic indicators, particularly inflation and exchange rates. Inflation theory explains that increases in global commodity prices can create inflationary pressures through imported inflation mechanisms. Meanwhile, exchange rate theory suggests that changes in investment flows and capital movements may influence currency stability. These macroeconomic variables eventually affect economic growth through their impacts on purchasing power, production costs, and aggregate economic activity.

Previous studies have primarily concentrated on the direct relationship between gold prices and economic growth without comprehensively examining the indirect transmission mechanisms operating through macroeconomic variables. Therefore, a research gap remains regarding how gold prices indirectly influence economic growth through inflation, exchange rates, and investment channels.

To address this gap, the present study introduces novelty by integrating inflation, exchange rates, and investment as intervening variables in analyzing the relationship between gold prices and economic growth. This framework enables a broader understanding of the economic transmission mechanisms involved.

Accordingly, this research aims to investigate the effect of gold prices on Indonesia's economic growth, both directly and indirectly through inflation, exchange rates, and investment. Based on the theoretical framework, the hypotheses proposed in this study are as follows:

1. Gold prices influence inflation.
2. Gold prices influence exchange rates.
3. Gold prices influence investment.
4. Inflation influences economic growth.
5. Exchange rates influence economic growth.
6. Investment influences economic growth.
7. Gold prices influence economic growth.

Theoretically, this research can significantly contribute to the development of macroeconomic literature, particularly regarding the role of gold commodities in the dynamics of economic growth in developing countries. Practical benefits for the Government and Policymakers: It can serve as a consideration for the government and economic authorities in formulating macroeconomic policies that are more adaptive to the dynamics of global gold prices and assist the government in maintaining a balance between the utilization of natural resources and efforts to encourage sustainable economic growth. For Monetary Authorities such as Bank Indonesia, understanding the relationship between gold price movements, inflation, and exchange rates is crucial in supporting the formulation of monetary policies aimed at maintaining price stability and the financial system, particularly during times of global economic turmoil that drive up gold prices. For Investors and Market Players, this research can serve

as a reference in understanding the implications of gold price changes on the national economy and the investment climate. By understanding the relationship between gold prices and economic growth, investors are expected to be able to make more rational and informed investment decisions, both in allocating portfolios between gold assets and productive sectors and in anticipating macroeconomic risks.

LITERATURE REVIEW

Economic Growth Theory

Economic growth theory states that a nation's economic performance is shaped by the accumulation of capital, the size and quality of the labor force, and advancements in technology. The neoclassical growth framework introduced by Robert M. Solow highlights the critical role of technology as an exogenous factor in driving long-term output growth (Solow, 1956). Moreover, from a Keynesian viewpoint, economic expansion is also influenced by aggregate demand, particularly through investment and exports, which stimulate increases in national income (Keynes, 1936).

Empirical findings by Robert J. Barro (1991) indicate that capital formation and macroeconomic stability play significant roles in promoting economic growth. In contrast, Paul M. Romer (1986), through endogenous growth theory, argues that innovation and knowledge accumulation are fundamental determinants of sustained long-term growth.

Recent studies on economic growth have expanded classical theories by highlighting the roles of financial markets, foreign exchange reserves, commodity prices, and global uncertainty in influencing economic performance. Since the COVID-19 pandemic, researchers have paid greater attention to how external shocks affect economic growth through investment, exchange rates, capital flows, and financial market conditions.

Dyanti and Nirmala (2025) found that inflation, exchange rates, and stock market performance significantly affect gold prices in Indonesia in both the short and long run. Their findings indicate that gold prices are closely linked to domestic macroeconomic conditions and may indirectly influence economic growth through investment decisions and investor confidence.

Using the Autoregressive Distributed Lag (ARDL) model, Hasanudin et al. (2022) showed that gold prices have a long-run relationship with GDP, inflation, exchange rates, and stock market performance. This suggests that gold prices can reflect macroeconomic stability and investors' expectations.

At the global level, Salisu et al. (2021) found that gold acts as a safe-haven asset during periods of economic uncertainty, particularly during the COVID-19 pandemic. Similarly, Cui et al. (2022) reported that gold remains an effective hedge against volatility in oil prices and financial markets. These findings indicate that gold plays an important role in maintaining financial stability during periods of global uncertainty.

Recent studies also emphasize the importance of foreign exchange reserves for sustainable economic growth. Adequate reserves help maintain exchange rate stability, increase investor confidence, support international trade, and strengthen a country's ability to withstand external shocks (International Monetary Fund, 2023; World Bank, 2024).

Gold Price Theory

Gold Price Theory explains that gold prices are influenced by several macroeconomic factors, such as inflation, interest rates, exchange rates, foreign exchange reserves, and global economic uncertainty. Gold is widely regarded as a safe-haven asset because its value tends to remain stable or increase during periods of financial instability (Baur & Lucey, 2010). In addition, Erb and Harvey (2013) argue that gold prices are closely related to long-term inflation expectations, making gold an effective store of value.

Recent studies show that gold prices are increasingly affected by both domestic economic conditions and global uncertainty. Since the COVID-19 pandemic, researchers have focused on the role of gold in reducing investment risk and maintaining financial stability during periods of economic disruption.

Salisu et al. (2021) found that investors tend to increase their demand for gold during periods of high uncertainty, confirming its role as a safe-haven asset. Similarly, Wang et al. (2021) reported that gold can effectively hedge against exchange rate fluctuations, particularly during periods of high currency volatility. Furthermore, Cui et al. (2022) showed that gold continues to protect investors from volatility in oil prices and financial markets, especially during times of global economic uncertainty.

In Indonesia, Hasanudin et al. (2022) used the Autoregressive Distributed Lag (ARDL) model and found a long-run relationship between gold prices and key macroeconomic variables, including GDP, inflation, exchange rates, and stock market performance. Likewise, Dyanti and Nirmala (2025) found that inflation, exchange rates, and the Indonesian Composite Stock Price Index (IHSG) significantly influence gold prices in both the short and long run, indicating that gold prices are highly responsive to changes in macroeconomic conditions.

Recent literature also highlights the importance of foreign exchange reserves in supporting exchange rate stability and strengthening investor confidence, which indirectly influences gold price movements and overall economic performance (International Monetary Fund, 2023; World Bank, 2024).

Inflation Theory

Inflation Theory explains that inflation is a continuous increase in the general price level that reduces the purchasing power of money. According to the classical view, inflation mainly results from excessive growth in the money supply, whereas Keynesian theory argues that inflation is driven by increases in aggregate demand and production costs (Friedman, 1968; Keynes, 1936). While moderate inflation may encourage economic activity, persistent inflation can discourage investment, reduce macroeconomic stability, and hinder economic growth.

Recent studies show that inflation is increasingly influenced by global uncertainty, commodity price movements, and financial market conditions. Since the COVID-19 pandemic, supply chain disruptions, rising energy prices, and geopolitical tensions have intensified inflationary pressures worldwide, making inflation a key factor affecting both investment decisions and economic stability.

Inflation also has an important relationship with gold prices. During periods of rising inflation, investors tend to increase their demand for gold as a hedge against the declining purchasing power of money. Using the Autoregressive Distributed Lag (ARDL) model, Safdar and Ayyoub (2023) found a significant long-run relationship between inflation and gold prices, confirming gold's role as an effective inflation hedge.

Evidence from Indonesia supports these findings. Hasanudin et al. (2022) reported that gold prices have a long-run relationship with GDP, inflation, exchange rates, and stock market performance. Similarly, Dyanti and Nirmala (2025) found that inflation, exchange rates, and the Indonesian Composite Stock Price Index (IHSG) significantly influence gold prices in both the short and long run. Ariswati et al. (2025) further showed that inflation and monetary policy affect domestic gold prices indirectly through exchange rate movements, highlighting the close interaction among inflation, currency stability, and gold prices.

Recent macroeconomic studies also emphasize that maintaining low and stable inflation strengthens exchange rate stability, improves investor confidence, and supports sustainable economic growth. Likewise, adequate foreign exchange reserves help stabilize the domestic currency and reduce inflationary pressures caused by external shocks (International Monetary Fund, 2023; World Bank, 2024).

Exchange Rate Theory

Exchange Rate Theory explains that the exchange rate represents the value of one currency relative to another and plays an essential role in international trade, investment, and macroeconomic stability. Exchange rate movements are influenced by several factors, including inflation, interest rates, foreign exchange reserves, capital flows, and market expectations. According to the Purchasing Power Parity (PPP) and Interest Rate Parity (IRP) theories, differences in inflation and interest rates between countries lead to exchange rate adjustments, which in turn affect trade competitiveness and economic growth (Krugman & Obstfeld, 2009; Dornbusch, 1976).

Recent studies indicate that exchange rates have become increasingly sensitive to global uncertainty and financial market conditions. Since the COVID-19 pandemic, exchange rate volatility has risen because of supply chain disruptions, geopolitical tensions, and fluctuations in international capital flows, making exchange rate stability an important factor in supporting economic performance.

Exchange rate movements are also closely associated with gold prices. Because gold is traded globally in U.S. dollars, depreciation of the domestic currency generally leads to higher domestic gold prices. During periods of exchange rate instability, investors tend to shift their investments to gold as a hedge against currency risk. Akhtaruzzaman et al. (2021) found that gold became a stronger safe-haven

asset during the COVID-19 pandemic when uncertainty in exchange rates and financial markets increased.

Evidence from Indonesia confirms this relationship. Hasanudin et al. (2022) found that exchange rates, inflation, GDP, and stock market performance have a long-run relationship with gold prices using the Autoregressive Distributed Lag (ARDL) model. Likewise, Dyanti and Nirmala (2025) reported that exchange rates significantly affect gold prices in both the short run and the long run, indicating that currency movements are an important determinant of gold price fluctuations in Indonesia.

Recent research also shows that exchange rate movements influence economic performance through their effects on trade, investment, and financial markets. Using the ARDL approach, Garg, Narwal, and Rani (2025) found that exchange rates significantly affect gold prices in the short run, while inflation, GDP, and stock market performance contribute to long-run price adjustments.

In addition, foreign exchange reserves play an important role in maintaining exchange rate stability. Sufficient reserves allow central banks to reduce exchange rate volatility, strengthen investor confidence, support international trade, and improve resilience to external economic shocks (International Monetary Fund, 2023; World Bank, 2024).

Investment Theory

Investment Theory explains that investment is the allocation of financial resources to assets or productive activities with the expectation of earning future returns. According to Keynes (1936), investment decisions depend on expected profits, interest rates, and business expectations. Likewise, Tobin's Q Theory (Tobin, 1969) states that firms are more likely to invest when the market value of capital exceeds its replacement cost, while Modern Portfolio Theory (Markowitz, 1952) emphasizes diversification as a strategy to maximize returns and reduce investment risk.

Recent studies suggest that investment decisions are increasingly influenced by macroeconomic conditions, financial market uncertainty, and commodity price movements. Since the COVID-19 pandemic, investors have shown greater interest in safe-haven assets, particularly gold, to protect their wealth during periods of economic uncertainty.

Gold is widely recognized as an attractive investment because it can preserve value during periods of inflation and financial instability. Salisu et al. (2021) found that investors shifted their portfolios from risky financial assets to gold during the COVID-19 pandemic, confirming its role as a safe-haven asset. Similarly, Cui et al. (2022) reported that gold effectively protects investors against volatility in oil prices and financial markets, highlighting its importance in investment risk management.

Evidence from Indonesia also demonstrates the influence of macroeconomic conditions on investment decisions. Hasanudin et al. (2022) found a long-run relationship between gold prices and GDP, inflation, exchange rates, and stock market performance using the Autoregressive Distributed Lag (ARDL) model. Likewise, Dyanti and Nirmala (2025) showed that inflation, exchange rates, and the Indonesian Composite Stock Price Index (IHSG) significantly affect gold prices in both the short

run and the long run. These findings indicate that investors consider macroeconomic conditions when investing in gold.

Recent literature also highlights the role of foreign exchange reserves in creating a stable investment climate. Adequate reserves help maintain exchange rate stability, strengthen investor confidence, reduce financial risks, and encourage both domestic and foreign investment (International Monetary Fund, 2023; World Bank, 2024). Consequently, macroeconomic stability is essential for promoting sustainable investment and long-term economic growth.

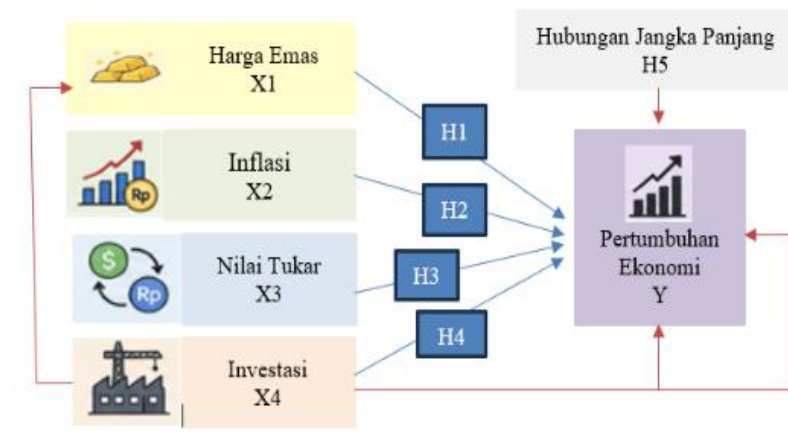


Figure 1. Framework of Thought

The Autoregressive Distributed Lag (ARDL) model has been widely adopted in macroeconomic research due to its robustness in capturing both short-run and long-run equilibrium dynamics, enabling comprehensive analysis of the interrelationships among inflation, gold prices, exchange rates, foreign exchange reserves, and economic growth (Hasanudin et al., 2022; Safdar & Ayyoub, 2023; Dyanti & Nirmala, 2025).

Based on the conceptual framework, which explains the direct and indirect relationships between gold prices and Indonesia's economic growth through macroeconomic transmission channels, the following hypotheses are proposed:

- H1: Gold prices are expected to exert a significant (negative/positive) effect on economic growth.
- H2: Inflation is expected to negatively affect economic growth.
- H3: Exchange rates are expected to negatively affect economic growth.
- H4: Investment (GFCF) is expected to positively affect economic growth.
- H5: There is a long-run equilibrium (cointegration) relationship among the variables.

RESEARCH METHODOLOGY

Research Design and Approach

This study adopts a quantitative research design supported by econometric techniques to investigate causal linkages among macroeconomic variables. The quantitative approach is appropriate because the analysis is based on numerical time-series data processed using statistical methods.

The study applies the Autoregressive Distributed Lag (ARDL) model, which is effective in examining both short-term dynamics and long-term equilibrium relationships among variables. The ARDL method is particularly advantageous as it can handle variables integrated at different levels, specifically $I(0)$ and $I(1)$, and remains reliable even when working with relatively limited sample sizes.

Data Type and Sources

Data Type

The research utilizes secondary data, defined as data that have already been collected and published by institutions or prior researchers. The dataset is structured in the form of time-series observations.

Data Sources

To maintain data accuracy and consistency, all data are obtained from credible and authoritative sources:

- Gold prices: World Gold Council, Investing, International Monetary Fund (IMF)
- Inflation: Badan Pusat Statistik (BPS)
- Exchange rate: Bank Indonesia (BI)
- Investment (Gross Fixed Capital Formation): BPS
- Economic growth (GDP): BPS

Data Period

The analysis covers the period from 2010 to 2025, depending on data availability.

Research Variables

- Independent Variable: Gold Price
- Intervening Variables: Inflation, Exchange Rate, and Investment
- Dependent Variable: Economic Growth

Operational Definition of Variables

Variable	Definition	Indicator	Unit
Gold Price (X)	International gold price as a safe haven asset	Price per troy ounce	USD
Inflation (Z1)	Sustained increase in general price levels	Consumer Price Index (CPI)	%
Exchange Rate (Z2)	Value of Indonesian Rupiah against USD	BI middle exchange rate	IDR/USD
Investment (Z3)	Gross fixed capital formation	GFCF	Billion IDR
Economic Growth (Y)	Increase in national output	Real GDP growth	%

Analytical Method

The study employs the ARDL approach through several analytical stages :

Stationarity Test (ADF Test)

The Augmented Dickey-Fuller (ADF) test is performed to assess whether the time-series data are stationary. A dataset is considered stationary when its mean and variance remain stable over time and it does not exhibit a persistent trend.

The ADF model is formulated as :

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \sum \gamma_i \Delta Y_{t-i} + \epsilon_t$$

Decision rules:

- Based on probability:
 - p-value < 0.05 indicates stationarity
 - p-value > 0.05 indicates non-stationarity
- Based on statistical values:
 - ADF statistic lower than the critical value indicates stationarity
 - ADF statistic higher than the critical value indicates non-stationarity

Cointegration Test

The cointegration test is conducted to determine whether a long-term equilibrium relationship exists among the variables.

Decision criteria :

- Trace statistic exceeding the critical value (5%) indicates cointegration
- Max-Eigen statistic exceeding the critical value indicates cointegration
- p-value < 0.05 indicates statistical significance

If cointegration is confirmed, the Error Correction Model (ECM) is applied. Otherwise, a Vector Autoregression (VAR) model in first differences is used.

ARDL Model Estimation

The ARDL framework is employed to estimate both short-run and long-run relationships within a unified model. The general specification is as follows :

$$Y_t = \alpha + \sum \beta_i Y_{t-i} + \sum \gamma_i X_{t-i} + \sum \delta_i INF_{t-i} + \sum \theta_i KUR_{t-i} + \sum \lambda_i INV_{t-i} + \epsilon_t$$

Short-run and Long-run Analysis

This stage aims to evaluate both immediate effects and long-term equilibrium relationships between the independent variables and economic growth.

The long-run model is expressed as :

$$Y_t = \alpha + \beta_1 X_t + \beta_2 INF_t + \beta_3 KUR_t + \beta_4 INV_t + \epsilon_t$$

- The estimated coefficients represent long-term impacts
- A p-value below 0.05 indicates statistical significance

Causality Test

- The Granger causality test is applied to identify the direction of influence among variables. It determines whether relationships are unidirectional, bidirectional, or nonexistent.
- The model is specified as :

$$Y_t = \alpha + \sum \beta_i Y_{t-i} + \sum \gamma_i X_{t-i} + \epsilon_t$$

$$X_t = \alpha + \sum \beta_i X_{t-i} + \sum \gamma_i Y_{t-i} + \epsilon_t$$

Decision rules:

- p-value < 0.05 indicates the presence of causality

- $p\text{-value} > 0.05$ indicates no causal relationship

RESULT AND DISCUSSION

Data Description

This study employs annual time series data covering the period 2010–2025. The variables consist of gold prices as the main explanatory variable, inflation, exchange rate, and Gross Fixed Capital Formation (GFCF) as intermediate variables, while economic growth is used as the dependent variable.

The dataset is constructed from secondary sources obtained from official and credible institutions, ensuring consistency and reliability for empirical analysis.

Gold Price Development

Gold price data used in this study represent annual average movements measured in USD per troy ounce. Over the observation period, gold prices exhibit a clear upward trend with several pronounced increases, particularly during periods of global uncertainty. This pattern confirms gold's role as a **store of value and safe haven asset**, especially during financial instability and economic shocks.

Inflation Development

Inflation data are measured using the Consumer Price Index (CPI) published by the national statistical authority. Throughout the study period, inflation in Indonesia remains relatively stable within a controlled range. However, temporary spikes are observed in specific years, reflecting external shocks and domestic price adjustments. The lowest inflation levels occur during periods of economic slowdown, indicating weak demand pressure.

Exchange Rate Movement

The exchange rate variable is represented by the annual average of the Rupiah against the US Dollar. The results indicate a persistent depreciation trend of the Rupiah over time. This long-term weakening reflects external pressures, capital flow dynamics, and global economic conditions that influence currency stability in emerging economies such as Indonesia.

Investment (GFCF)

Gross Fixed Capital Formation is used as a proxy for investment activity in the economy. The data show a generally increasing trend in investment over the sample period, despite a noticeable contraction during the global pandemic period. After the shock, investment gradually recovered, indicating improved investor confidence and economic resilience.

Economic Growth

Economic growth is measured using real GDP growth rates. The Indonesian economy demonstrates relatively stable growth performance over the study period. However, a significant contraction is observed during the COVID-19 shock period, followed by a recovery phase in subsequent years, reflecting economic adjustment and policy response effectiveness.

Empirical Results

Unit Root Test (ADF Test)

To ensure the validity of time series estimation, stationarity is examined using the Augmented Dickey-Fuller (ADF) test. The results show that several variables are non-stationary at level form but become stationary after first differencing. This indicates a mixed order of integration, $I(0)$ and $I(1)$, which is appropriate for the ARDL framework. Therefore, the model satisfies the prerequisite for applying the ARDL approach, which accommodates variables with different integration orders.

Cointegration Test (Bounds Test)

The bounds testing procedure confirms the existence of a long-run relationship among the variables.

Tabel 2. Bounds Test

Test Statistic	Value	I(0) 5%	I (1) 5%
F-Statistic	5.21	2.86	4.01

The calculated F-statistic exceeds the upper bound critical value at the 5% significance level. This indicates that gold prices, inflation, exchange rate, investment, and economic growth move together in the long run. Thus, a stable long-term equilibrium relationship exists among the variables.

Long-Run Estimation Results

Tabel 3. Long Run Coefficients

Variabel	Koefisien	Direction	Conclusion
Harga Emas	-0.0042	Negatif	Signifikan
Inflasi	-0.0215	Negatif	Signifikan
Nilai Tukar	-0.0018	Negatif	Signifikan
Investasi	0.0096	Positif	Signifikan

The long-run ARDL estimation reveals that gold prices, inflation, and exchange rate exert a **negative influence** on economic growth, while investment shows a **positive effect**. Gold price increases are associated with lower economic growth due to capital reallocation toward non-productive safe assets. Inflation reduces purchasing power and weakens economic activity. Exchange rate depreciation increases import costs, reducing production efficiency.

In contrast, investment plays a central role in expanding productive capacity and stimulating long-term growth.

Short-Run Dynamics (ECM Model)

Tabel 4. ECM Short Run

Variabel	Koefisien	t-stat	Prob	Conclusion
Δ Gold	-0.0031	-2.11	0.048	Signifikan
Δ Inflation	-0.0124	-1.98	0.061	Marginal
Δ Exchange	-0.0012	-2.03	0.052	Marginal
Δ Investasi	0.0079	2.72	0.034	Signifikan
ECT(-1)	-0.77	-4.21	0.000	Signifikan

The short-run estimation indicates that all variables significantly affect economic growth. The Error Correction Term (ECT) is negative and statistically significant, confirming that deviations from

long-run equilibrium are corrected over time. This supports the validity of the model in capturing both short-term fluctuations and long-term adjustments.

In the short run, gold prices, inflation, and exchange rate fluctuations negatively affect growth, while investment continues to contribute positively.

Diagnostic Tests

Tabel 5. Diagnostic Tests

Tests	Output	Conclusion
Autokorelasi (DW)	2.11	Tidak ada autokorelasi
Normalitas	JB tidak signifikan	Residual normal
Heteroskedastisitas	Tidak signifikan	Homoskedastik
Model Fit	$R^2 = 0.82$	A good model

The diagnostic results confirm that the model satisfies classical assumptions. There is no evidence of autocorrelation or heteroskedasticity, and the residuals are normally distributed. This indicates that the model is statistically reliable and robust for interpretation.

Indirect Effects (Transmission Mechanism)

Further analysis shows that gold prices influence economic growth not only directly but also indirectly through inflation, exchange rate, and investment channels.

Among these channels, investment appears to be the strongest transmission mechanism. Gold price increases reduce investment activity while simultaneously affecting macroeconomic stability, thereby amplifying their indirect impact on economic growth.

Discussion

The empirical findings confirm that gold prices negatively affect economic growth across both time horizons. This outcome aligns with the safe haven perspective proposed by Dirk G. Baur and Brian M. Lucey, although the current study extends this view by emphasizing that the impact persists beyond crisis periods through structural investment shifts.

The results are partially consistent with Muhammad Shahbaz et al. (2019), yet this study highlights that investment channels dominate the transmission process more than trade-related mechanisms.

In contrast to Nicholas Apergis and James E. Payne (2014), who reported positive long-run effects in other economies, Indonesia exhibits a different pattern due to its structural dependence on real-sector investment behavior.

Inflation and exchange rate movements also play significant roles in shaping economic performance, supporting monetary theory by Frederic S. Mishkin and exchange rate theory literature. However, their effects are found to be more complex in emerging market contexts.

Investment remains the most critical determinant of growth, consistent with the neoclassical framework of Robert M. Solow, although this study further emphasizes the importance of investment quality rather than quantity.

Overall, the findings suggest that the economic impact of gold prices is highly dependent on structural characteristics of the economy. In Indonesia, investment reallocation emerges as the key mechanism shaping macroeconomic outcomes.

CONCLUSION

This study examines the relationship between gold prices and economic growth in Indonesia using the ARDL approach over the 2010–2025 period. Based on the empirical analysis, several conclusions can be formulated.

First, the findings confirm the existence of a stable long-term relationship among gold prices, inflation, exchange rates, investment, and economic growth. This indicates that these variables are interconnected within the Indonesian macroeconomic structure.

Second, gold prices are found to have a negative and statistically significant effect on economic growth in both the short and long run. This result implies that increases in gold prices tend to reduce economic performance as investment shifts from productive sectors toward safe-haven assets such as gold.

Third, inflation and exchange rate depreciation also negatively affect economic growth. Rising inflation weakens purchasing power and macroeconomic stability, while currency depreciation increases import and production costs, thereby constraining economic activity over time.

Fourth, investment represented by Gross Fixed Capital Formation (GFCF) plays a significant positive role in promoting economic growth. Higher investment levels contribute to increased productive capacity, employment creation, and overall economic expansion.

Fifth, the impact of gold prices on economic growth is not solely direct but also transmitted indirectly through inflation, exchange rates, and investment. Among these channels, investment emerges as the most dominant mechanism linking gold price fluctuations to economic performance.

In general, the study concludes that the influence of gold prices on economic growth is multidimensional and highly dependent on structural economic conditions. In the Indonesian context, investment reallocation serves as the primary mechanism explaining how gold price shocks affect macroeconomic performance.

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