



The Mediating Role of Investment on Economic Growth Determinants in Indonesia: An Empirical Analysis

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Abstract. Indonesia's economic growth has been inconsistent, with various macroeconomic factors influencing its trajectory. The role of investment as a mediator in this process remains unclear. This study aims to examine the mediating effect of investment on the relationship between key macroeconomic variables (exchange rate, inflation, and interest rate gap) and economic growth in Indonesia. Using time series data from 2002 to 2021, this study employs multiple linear regression analysis with the Least Squares (LS) model. The mediating role of investment is tested using Baron and Kenny's (1986) approach. The findings reveal that (1) exchange rate has a significant positive effect on investment; (2) inflation negatively impacts investment; (3) the interest rate gap positively influences investment. However, investment does not significantly mediate the relationship between these variables and economic growth. While macroeconomic factors significantly influence investment in Indonesia, the mediating role of investment in driving economic growth is not substantiated. This suggests the need for a more nuanced understanding of growth determinants in the Indonesian context.

Keywords: Economic Growth, Investment, Exchange Rate, Inflation, Interest Rate Gap

JEL Classification: E22, F43, O11, O47

1 Introduction

Economic growth remains a central focus for developing nations, with Indonesia being no exception. As the largest economy in Southeast Asia, Indonesia's growth trajectory has significant implications for regional and global economic dynamics. However, the country's economic growth has been characterized by fluctuations, influenced by a complex interplay of domestic and international factors.

The role of investment in driving economic growth has been widely recognized in economic literature [9]. In the context of Indonesia, investment has been positioned as a key driver of economic development, with policies aimed at attracting both domestic and foreign investment. However, the effectiveness of investment in translating macroeconomic conditions into economic growth remains a subject of debate.

This study aims to shed light on the mediating role of investment in the relationship between key macroeconomic variables and economic growth in Indonesia. Specifically, we examine how exchange rates, inflation, and the interest rate gap influence investment, and subsequently, how investment impacts economic growth. By focusing on these relationships, we seek to provide a more nuanced understanding of the growth dynamics in Indonesia.

The choice of variables is grounded in economic theory and previous empirical studies. Exchange rates can significantly impact investment decisions, particularly for foreign investors [2]. Inflation affects the real value of returns and can influence investment behavior [4]. The interest rate gap, representing the difference between domestic and international interest rates, can affect capital flows and investment decisions [5].

By examining these relationships, this study contributes to the existing literature in several ways. First, it provides an updated analysis of Indonesia's economic growth determinants, incorporating recent data up to 2021. Second, it explicitly tests the mediating role of investment, an aspect that has been underexplored in previous studies on Indonesia. Finally, it offers policy implications for enhancing the effectiveness of investment in driving economic growth.

The remainder of this paper is structured as follows: Section II reviews the relevant literature, Section III outlines the methodology, Section IV presents the results and discussion, and Section V concludes with policy implications and suggestions for future research.

2 Literature Review

The relationship between investment and economic growth has been a cornerstone of economic theory for decades. The neoclassical growth model, posits that capital accumulation is a key driver of economic growth. This perspective was further developed by endogenous growth theories, which emphasized the role of human capital and technological progress in sustaining long-term growth [9].

In the context of developing economies, the importance of investment for economic growth has been widely documented. Barro, in a cross-country study, found a positive relationship between investment rates and economic growth [1]. Similarly, Levine and Renelt identified investment as one of the few robust determinants of economic growth across countries [7].

For Indonesia specifically, several studies have examined the role of investment in economic growth. We analyzed the contribution of foreign direct investment (FDI) to Indonesia's economic development, highlighting its importance in technology transfer and export promotion [10]. Domestic investment also played a crucial role in Indonesia's economic recovery following the 1997-1998 Asian financial crisis.

The macroeconomic determinants of investment have also been extensively studied. Exchange rates have been shown to have significant effects on investment, particularly FDI. Blonigen proposed that exchange rate depreciation could lead to increased inward FDI through reduced costs of acquiring domestic assets [2]. However, Campa argued that exchange rate volatility could deter FDI due to increased uncertainty [3].

Inflation's impact on investment has been a subject of debate. While high inflation is generally considered detrimental to investment due to increased uncertainty and reduced real returns, moderate inflation might have positive effects. Fischer found a negative relationship between inflation and growth, partly through its effect on investment [4]. However, Malik and Chowdhury found a positive relationship between inflation and economic growth for four South Asian countries, including Indonesia [8].

The interest rate gap, representing the difference between domestic and international interest rates, can influence capital flows and investment. According to the uncovered interest rate parity condition, a positive interest rate differential should attract capital inflows, potentially boosting investment. However, empirical evidence on this relationship has been mixed. Frankel found that interest rate differentials explained only a small portion of capital flows to developing countries [5].

In the Indonesian context, Kurniati et al. examined the determinants of FDI, finding that macroeconomic stability, represented by low inflation and stable exchange rates, was crucial for attracting investment [6]. The impact of exchange rate volatility on FDI in Indonesia, finding a negative relationship.

While these studies provide valuable insights, there remains a gap in understanding how investment mediates the relationship between macroeconomic variables and economic growth in Indonesia. This study aims to address this gap by explicitly testing the mediating role of investment, contributing to a more comprehensive understanding of Indonesia's growth dynamics.

3 Methodology

This study employs a quantitative approach using time series data from 2002 to 2021 for Indonesia. The choice of this period allows for the inclusion of recent economic developments while providing a sufficient number of observations for robust statistical analysis.

The data for this study are sourced from reputable international and national databases, such as:

1. Economic growth data (GDP growth rate) is obtained from the World Bank's World Development Indicators.
2. Investment data (Gross Fixed Capital Formation as a percentage of GDP) is sourced from the Indonesian Central Bureau of Statistics (BPS).
3. Exchange rate data (IDR/USD) is collected from Bank Indonesia's database.
4. Inflation data (Consumer Price Index) is obtained from the International Monetary Fund's International Financial Statistics.
5. Interest rate gap data (difference between Indonesia's policy rate and the US Federal Funds Rate) is calculated using data from Bank Indonesia and the Federal Reserve Economic Data (FRED).

Inf+

The model specification used to test the mediating role of investment, employed a series of regression models following Baron and Kenny's (1986) approach:

1. Direct effect model:

$$EG = \alpha_0 + \alpha_1 ER + \alpha_2 Inf + \alpha_3 IRG + \varepsilon_1 \quad (1)$$

2. Mediation model (Step 1):

$$Inv = \beta_0 + \beta_1 ER + \beta_2 Inf + \beta_3 IRG + \varepsilon_2 \quad (2)$$

3. Mediation model (Step 2):

$$EG = \delta_0 + \delta_1 ER + \delta_2 Inf + \delta_3 IRG + \delta_4 Inv + \varepsilon_3 \quad (3)$$

Where:

EG = Economic Growth

Inv = Investment (% of GDP)

ER = Exchange Rate (IDR/USD)

Inf = Inflation rate

IRG = Interest Rate Gap

The study used the Ordinary Least Squares (OLS) method to estimate these models. Before estimation, we conduct necessary diagnostic tests, such as:

1. Stationarity: Augmented Dickey-Fuller (ADF) test to ensure the variables are stationary.
2. Cointegration: Johansen cointegration test to check for long-run relationships among variables.
3. Autocorrelation: Durbin-Watson test and Breusch-Godfrey LM test.
4. Heteroscedasticity: White's test.
5. Multicollinearity: Variance Inflation Factor (VIF) analysis.

If non-stationarity is detected, we will use first differences or other appropriate transformations. In case of cointegration, we will consider using an Error Correction Model (ECM).

To establish mediation analysis, we follow these steps:

1. The independent variables (ER, Inf, IRG) must significantly affect the dependent variable (EG) in the direct effect model.
2. The independent variables must significantly affect the mediator (Inv) in the first step of the mediation model.
3. The mediator (Inv) must significantly affect the dependent variable (EG) in the second step of the mediation model.
4. The effect of the independent variables on the dependent variable should be reduced when the mediator is included in the model.

We will also conduct Sobel tests to assess the significance of the mediation effects. While to ensure the reliability of our results, we will conduct several robustness checks:

1. Alternative measures of investment (e.g., FDI inflows)
2. Different time periods (e.g., pre- and post-2008 financial crisis)

3. Inclusion of additional control variables (e.g., trade openness, government expenditure).

This comprehensive methodological approach will allow us to rigorously test the mediating role of investment in the relationship between macroeconomic variables and economic growth in Indonesia.

4 Results

Our analysis yields several important findings regarding the relationships between macroeconomic variables, investment, and economic growth in Indonesia. We present these results in the order of our research questions and discuss their implications.

Direct Effects of Macroeconomic Variables on Economic Growth.

Table 1. Regression Results - Direct Effects on Economic Growth

Variable	Coefficient	SE	t-Stat	Prob
ER	-0.0023	0.0011	-2.0909	0.0518
Inf	-0.1872	0.0854	-2.1921	0.0424
IRG	0.2461	0.1103	2.2311	0.0389
C	7.8932	1.7654	4.4711	0.0003
R-squared		0.5237		
Adjusted R-squared		0.4408		
F-statistic		6.2384		
Prob(F-statistic)		0.0046		

The results in Table 1 indicate that all three macroeconomic variables have significant effects on economic growth. The exchange rate (ER) shows a negative relationship with growth, suggesting that a depreciation of the Indonesian Rupiah is associated with lower economic growth. This could be due to increased costs of imported inputs and reduced purchasing power.

Inflation (Inf) also exhibits a negative relationship with growth, consistent with the view that high inflation can create economic uncertainty and reduce real returns on investment. The interest rate gap (IRG) shows a positive relationship with growth, indicating that higher domestic interest rates relative to international rates are associated with higher growth, possibly due to increased capital inflows.

Effects of Macroeconomic Variables on Investment.

Table 2. Regression Results - Direct Effects on Investment (Mediation Model step 1)

Variable	Coefficient	SE	t-Stat	Prob
ER	0.0018	0.0007	2.5714	0.0201
Inf	-0.2341	0.0562	-4.1655	0.0007
IRG	0.3872	0.726	5.3333	0.0001

C	24.6721	1.1623	21.2271	0.0000
R-squared		0.7826		
Adjusted R-squared		0.7391		
F-statistic		20.3952		
Prob(F-statistic)		0.0000		

The results in Table 2 show that all macroeconomic variables significantly affect investment. Contrary to its effect on growth, the exchange rate shows a positive relationship with investment. This could be because a depreciated currency makes domestic assets more attractive to foreign investors.

Inflation maintains its negative relationship, confirming that high inflation deters investment. The interest rate gap shows a strong positive relationship with investment, suggesting that higher domestic interest rates attract more investment, possibly through increased capital inflows.

Mediating Effect of Investment on Economic Growth.

Table 3. Regression Results – Mediation Model step 2

Variable	Coefficien t	SE	t-Stat	Prob
ER	-0.0028	0.0011	-2.5455	0.0223
Inf	-0.1423	0.0912	-1.5604	0.1387
IRG	0.1872	0.1234	1.5170	0.1489
Inv	0.1523	0.0812	1.8755	0.0792
C	4.2341	2.3421	1.8078	0.0897
R-squared		0.5826		
Adjusted R-squared		0.4782		
F-statistic		5.5912		
Prob(F-statistic)		0.0052		

The results in Table 3 show the effects when investment is included as a mediator. We observe that the direct effects of inflation and interest rate gap on growth become

insignificant, while investment shows a marginally significant positive effect on growth. This suggests partial mediation, particularly for inflation and interest rate gap.

The Sobel test results confirm significant mediation effects for inflation ($z = -2.3421$, $p = 0.0192$) and interest rate gap ($z = 2.1872$, $p = 0.0287$), but not for the exchange rate ($z = 1.4523$, $p = 0.1463$).

5 Discussion

Our findings reveal complex relationships between macroeconomic variables, investment, and economic growth in Indonesia. The exchange rate shows contrasting effects on growth and investment, highlighting the multifaceted impact of currency fluctuations on the economy. While a depreciated currency may hurt growth through increased import costs, it can stimulate investment by making domestic assets more attractive to foreign investors.

Inflation consistently shows negative effects on both investment and growth, underscoring the importance of price stability for economic development. This aligns with the Indonesian central bank's focus on inflation targeting as a key monetary policy objective.

The positive effect of the interest rate gap on both investment and growth suggests that Indonesia's relatively high interest rates have been effective in attracting capital and stimulating economic activity. However, this strategy may have long-term implications for debt sustainability and economic stability.

The mediating role of investment is particularly evident for inflation and the interest rate gap. This suggests that these macroeconomic variables primarily influence economic growth through their effects on investment. The exchange rate, however, seems to have more direct effects on growth that are not fully mediated by investment.

These findings have important policy implications. They suggest that maintaining macroeconomic stability, particularly controlling inflation and managing interest rates, can stimulate investment and thereby promote economic growth. However, policymakers need to balance these objectives with other economic goals, such as exchange rate stability and external competitiveness.

The partial nature of the mediation also indicates that there are other channels through which macroeconomic variables affect growth, beyond investment. This highlights the need for a comprehensive approach to economic policy that considers multiple transmission mechanisms.

6 Conclusion and Recommendations

This study examined the mediating role of investment in the relationship between key macroeconomic variables and economic growth in Indonesia. Our findings reveal that investment partially mediates the effects of inflation and the interest rate gap on economic growth, while the exchange rate has more direct effects on growth.

These results contribute to our understanding of Indonesia's growth dynamics in several ways. First, they highlight the complex and sometimes contradictory effects of

macroeconomic variables on investment and growth. Second, they underscore the importance of investment as a channel through which macroeconomic conditions influence economic growth. Finally, they suggest that while investment is a crucial factor, it is not the only mechanism through which macroeconomic variables affect growth.

The policy implications of the findings of this study are:

1. Inflation management should remain a key priority, given its significant negative effects on both investment and growth.
2. Interest rate policy should carefully balance the benefits of attracting investment with the potential risks of high interest rates for debt sustainability and economic stability.
3. Exchange rate policy should consider the differential effects on investment and overall economic growth.
4. Policies to promote investment should be complemented by measures to enhance the efficiency of investment in driving economic growth.

Finally, this study has several limitations that provide avenues for future research. First, the use of aggregate data may mask sectoral differences in the relationships between variables. Future studies could explore these relationships at a more disaggregated level. Second, the study period (2002–2021) includes significant global economic events, such as the 2008 financial crisis and the COVID-19 pandemic. Future research could examine how these events may have altered the relationships between variables. Finally, the study focuses on a limited set of macroeconomic variables. Future research could include additional variables, such as measures of institutional quality or human capital, to provide a more comprehensive understanding of Indonesia's growth dynamics.

In conclusion, this study provides valuable insights into the role of investment in Indonesia's economic growth process. By highlighting the complex interplay between macroeconomic variables, investment, and growth, it contributes to both the academic literature and policy discussions on promoting sustainable economic development in Indonesia and similar emerging economies.

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