e-ISSN 2798-0502

Jurnal Ekonomi, Manajemen, Akuntansi dan Keuangan Vol: 6, No 3, 2025, Page: 1-16

Analysis of The Influence of Monetary Variables and Foreign Direct Investment (FDI) on Indonesia's GDP From Q1 2014 to Q4 2023

Astried Vanessa Akhzani*, Tyas Danarti Hascaryani

Faculty of Economics and Business, Universitas Brawijaya, Indonesia

DOI: https://doi.org/10.53697/emak.v6i3.2400
*Correspondence: Astried Vanessa Akhzani
Email: vanessaakhzani@gmail.com

Received: 29-05-2025
Accepted: 16-06-2025
Published: 07-07-2025

Copyright: © 2025 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (http://creativecommons.org/licenses/by/4.0/).

Abstract: This study focuses on understanding how monetary variables and Foreign Direct Investment (FDI) affect Indonesia's economic growth in the 2014 Q1-2023 Q4 timeframe. There is a research gap in examining the impact of M2, interest rates, exchange rates, inflation, and FDI on GDP in both the short and long term. This study uses a VAR / VECM model approach that will examine the relationship between these variables. The results of this study are M2 has no effect on GDP, interest rates and inflation have a negative impact on GDP. FDI and exchange rate have a positive impact on GDP. Thus, it is necessary to have an effective combination of monetary policy so that an increase in foreign direct investment flows can encourage more sustainable economic growth in Indonesia.

Keywords: Economic Growth, Foreign Direct Investment (FDI), Monetary Policy, Vector Error Correction Model (VECM).

Introduction

Indonesia's economy has experienced significant growth dynamics over time. Economic growth is a crucial indicator in measuring a country's performance, reflecting how a nation develops through both its production and income sectors over a specific period. In general, economic growth is measured using Gross Domestic Product (GDP), which is closely related to monetary policy, including the control of money supply (M2), interest rate settings, exchange rate management, and inflation control (Sukirno, 2015). In addition, from an investment perspective, Foreign Direct Investment (FDI) plays an important role in boosting Indonesia's economic growth, not only by increasing domestic investment but also by creating jobs and enhancing productivity. When productivity increases, it can drive GDP growth.

GDP can be viewed from two perspectives: first, as the total income of all individuals in the economy, and second, as the total expenditure on goods and services produced through economic activity. These two perspectives are interconnected because, in a closed economy, income must equal expenditure (Mankiw, 2016). However, overly expansionary monetary policy can lead to high inflation, which ultimately reduces economic efficiency and hampers growth (Mishkin, 2016). On the other hand, a country's attractiveness as an

investment destination is strongly influenced by the effectiveness of its monetary policy (Krugman et al., 2020).

The time span of this study covers several significant economic events in Indonesia, such as the global economic slowdown, the depreciation of the rupiah that triggered inflation, and the COVID-19 pandemic, which has exerted tremendous pressure on the economy since 2019. This period saw a surge in uncertainty due to the pandemic, resulting in decreased economic activity (Altig et al., 2020). The impact of the crisis was still felt in 2022, during which Indonesia remained in a recovery phase. Additionally, geopolitical tensions such as the Russia-Ukraine conflict further contributed to global uncertainty. These circumstances raise important questions regarding the effectiveness of monetary policy and the contribution of FDI in supporting Indonesia's GDP growth amidst global economic pressures.

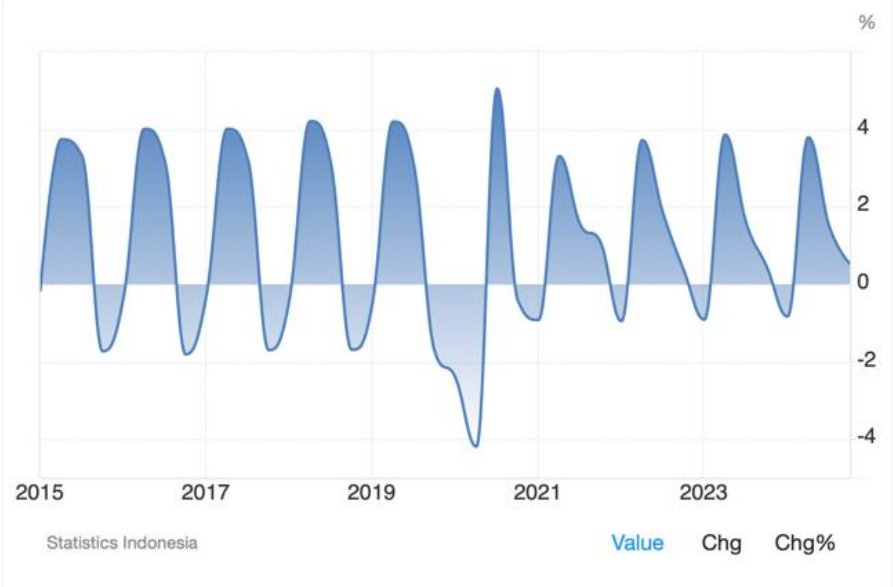

Figure 1. GDP Indonesia

Based on the graph, Indonesia's GDP demonstrates a fluctuating trend with consistent seasonal patterns from 2015 to early 2024. Each year shows recurring upward and downward movements, reflecting the influence of economic events such as Eid and year-end holidays on domestic consumption. Growth spikes typically occur in the second or third quarter, while slowdowns usually appear in the first and fourth quarters. A significant impact was observed in the second quarter of 2020, when a sharp economic contraction occurred due to the COVID-19 pandemic, with GDP growth dropping to nearly -5%. However, Indonesia's economy showed strong resilience, marked by recovery in the following quarters, particularly in 2021. From 2022 to 2024, growth volatility began to subside, showing a more stable trend, albeit not as strong as the initial post-pandemic rebound. This stability reflects a gradual structural recovery process and Indonesia's economic resilience amid global pressures. Overall, the quarterly GDP growth pattern depicts an adaptive economy and indicates a sustainable recovery trajectory.

Theoretically, an ideal economy is characterized by strong output growth, low unemployment, and controlled inflation. However, in practice, economies often undergo

cycles of contraction and expansion. In this context, monetary policy plays a central role in balancing these dynamics (Case et al., 2017). Monetary fluctuations and foreign investment flows are often major factors in determining macroeconomic policy directions in developing countries like Indonesia.

In Indonesia, monetary policy is implemented by Bank Indonesia with the primary goal of controlling the money supply and maintaining exchange rate and price stability. One of the main instruments used is the interest rate, which reflects the fundamental condition of the economy and influences consumption, investment, and financing decisions by households, businesses, and the government (El-Khodary, 2024). The exchange rate of the rupiah against foreign currencies, especially the US dollar, is believed to negatively affect currency value through stock investment. This is explained by the portfolio balance model theory, where firms can influence the demand for money used to run investments (Aji Prihatin et al., 2019)

On the other hand, M2 and interest rates are two monetary variables that significantly influence economic growth. M2 reflects the liquidity level in the economy, while the interest rate serves as a benchmark for borrowing costs and savings returns. Irving Fisher, as cited in Kunwar et al. (2023), stated that an increase in the money supply, ceteris paribus, will proportionally raise prices and reduce the real value of money. However, in recent years, Indonesia has experienced fluctuating growth, indicating the need for deeper analysis of these variables.

Many studies have examined the effects of M2, interest rates, exchange rates, inflation, and FDI on GDP, but their findings vary across countries. In Morocco, El-Khodary (2024) found that M2 has a short-term positive effect, while interest rates negatively impact growth. Razia & Omarya (2022) found that in Palestine, M2, fixed capital formation, and inflation positively impact growth in the short term but not in the long term. These studies highlight the importance of considering time dimensions (short-term and long-term) when analyzing the relationships among macroeconomic variables.

In Azerbaijan, Zeynalova (2024) discovered a unidirectional causal relationship between M2 and domestic credit, reinforcing arguments about M2's role in economic expansion. Meanwhile, Kunwar et al. (2023) highlighted the growing correlation between M2 and economic growth in Nepal. Buthelezi (2023) emphasized a trade-off between using M2 to stimulate growth and to stabilize inflation in South Africa. In South Asia, Jui et al. (2024) concluded that GDP is influenced by remittances, FDI, and inflation, although the impacts differ among countries depending on their structural and institutional conditions.

A study in Malta by Magazzino & Mele (2022) found no significant causal relationship between FDI and economic growth based on the Toda-Yamamoto test. However, using Artificial Neural Networks (ANNs), FDI was shown to have predictive power for growth. In Indonesia, Budiyanto & Wibowo (2021) found that inflation negatively affects GDP, while M2 and the exchange rate have significant positive effects, and the interest rate is statistically insignificant. Similarly, Asnawi & Fitria (2018) showed that M2, inflation, and interest rates simultaneously influence growth. Another study by Ryndaman Wachyudi et al. (2024) noted that GDP and interest rates affected M2 during the COVID-19

pandemic. Meanwhile, Salam & Basuki (2023) found that interest rates and GDP significantly influence inflation.

However, studies examining the impact of variables such as M2, interest rates, exchange rates, inflation, and FDI on Indonesia's GDP remain limited. Most previous studies are partial or use different analytical approaches. Therefore, this research aims to fill this gap by analyzing the interaction among these variables over the 2014–2023 period (quarterly). In this context, GDP is used as the primary indicator of economic growth, while M2, interest rates, exchange rates, inflation, and FDI serve as independent variables expected to comprehensively explain the dynamics of Indonesia's GDP.

Methodology

Indonesia's economic growth is influenced by various macroeconomic variables, particularly monetary indicators such as the money supply (M2), interest rates, inflation, and exchange rates. In addition, Foreign Direct Investment (FDI) also plays a crucial role in fostering capital accumulation and enhancing national productivity.

Between 2014 and 2023, Indonesia faced several global challenges, including exchange rate fluctuations, the economic crisis induced by the COVID-19 pandemic, as well as volatility in global interest rates and inflation. These factors have contributed to a complex domestic macroeconomic environment, thereby necessitating a modelling approach capable of capturing the simultaneous interactions among these variables.

The quantity theory of money posits that an increase in the money supply can lead to higher output in the short run. The Keynesian perspective emphasizes that lower interest rates can stimulate investment and consumption, thus promoting economic growth. Meanwhile, investment theory suggests that a decrease in interest rates can stimulate investment, thereby contributing to economic growth. The Mundell-Fleming model illustrates how exchange rates and interest rates affect capital flows, including FDI, which in turn influences GDP growth. The endogenous growth theory suggests that FDI brings in capital, technology, and management practices that enhance domestic productivity and innovation.

Given the complexity and dynamic interrelationships among these variables, an econometric modelling approach that can capture both short-run and long-run causal linkages simultaneously is required.

In this study, the hypotheses are formulated based on the background discussion, findings from previous research, and the theoretical framework presented earlier. Accordingly, it can be stated that M2, Foreign Direct Investment (FDI), and currency depreciation have a positive effect on Gross Domestic Product (GDP), while interest rates and inflation have a negative effect on GDP.

This study adopts a macroeconomic time series approach to examine the short- and long-run relationships between monetary variables, foreign direct investment (FDI), and Indonesia's Gross Domestic Product (GDP) from 2014 to 2023. The model employed is the Vector Error Correction Model (VECM), which is an extension of the Vector Autoregression (VAR) model. VECM is particularly suitable when the variables are non-stationary in levels

but exhibit a cointegration relationship, indicating long-run equilibrium among the variables (Fazaaloh, 2024).

The selection of the VECM approach is grounded in the work of Johansen (1988), which provides a robust framework for capturing both short-term dynamics and long-term equilibrium in multivariate time series data. Compared to traditional regression models, VECM allows for simultaneous equation modeling and endogenous interaction among variables, enabling a deeper exploration of macroeconomic interdependencies.

The model estimation follows the general procedure of time series econometrics as follows (Satria, 2018):

1. Stationarity Test: Using the Augmented Dickey-Fuller (ADF) test to determine the integration order of each variable.
2. Lag Length Determination: Employing criteria such as Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC/BIC), and Hannan-Quinn Criterion (HQC) to select the optimal lag length.
3. Cointegration Test: Applying the Johansen cointegration test to assess the existence of long-run relationships among the variables.
4. Model Estimation: Estimating the VECM if cointegration exists; otherwise, estimating a VAR model.
5. Diagnostic Checking: Conducting residual analysis, stability tests, and normality tests to ensure the model is well-specified.
6. Impulse Response Function (IRF) Analysis: Measuring the dynamic response of GDP to shocks in the independent variables.
7. Forecast Error Variance Decomposition (FEVD): Evaluating the proportion of forecast variance in GDP explained by innovations in each explanatory variable.

The VAR model is employed when no cointegration is found among the variables, with the general form expressed as:

$$Yt=\beta 0+\beta 1Y_{t-1}+\beta 2X_{t-1}+\varepsilon t$$

The VECM model is applied when cointegration exists among the variables, with the equation VECM Specification:

$$\Delta Y_t = a_0 + \sum_{i=1}^{M} \alpha_i \Delta Y_{t-i} + \sum_{j=1}^{M} \beta_j \Delta X_{t-j} + \theta EC_{t-1} + \varepsilon_t$$

Where:

- ΔYt: First difference of the dependent variable (GDP) at time tt
- $\Delta X\ t-j$: First differences of independent variables (M2, interest rate, inflation, exchange rate, and FDI)
- EC_{t-1}: Error correction term representing the long-run relationship
- α_i, β_j : Short-run coefficients
- θ: Adjustment coefficient of the error correction term
- εt: White noise error term

Result and Discussion

Stationarity Test

The results of the stationarity test using the Augmented Dickey-Fuller (ADF) approach are presented as follows:

Table 1. Stationarity Test

Variabel	Level	1st Diff	Description
PDB(Y)	0.7026	0.0000	stasioner
M2 (X1)	0.7324	0.0000	stasioner
Suku bunga (X2)	0.5020	0.0485	stasioner
Inflasi (X3)	0.0000	-	stasioner
Kurs (X4)	0.3323	0.0000	stasioner
PMA (X5)	*0.8971*	*0.0000*	*stasioner*

Source: Processed data by researcher (2024)

Based on the ADF test, the data are found to be non-stationary at level. This indicates the presence of a unit root, suggesting that the series is not mean-reverting and thus requires differencing to achieve stationarity. However, the inflation variable is stationary at level.

Optimal Lag Test

Table 2. Optimal Lag Test

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	264.106				1.6e-14	-14.7489	-14.6569	-14.4823*
1	302.911	77.61	36	0.000	1.4e-14	-14.9092	-14.2649	-13.0428
2	340.596	75.37	36	0.000	1.5e-14	-15.0055	-13.809	-11.5393
3	393.167	105.14	36	0.000	1.0e-14	-15.9524	-14.2036	-10.8864
4	477.147	167.96*	36	0.000	2.7e-15*	-18.6941*	-16.3931*	-12.0283

Source: Processed data by researcher (2024)

Determining the optimal lag length is crucial in estimating a VAR/VECM model. An excessively long lag length may result in inefficient estimates, whereas a too-short lag may fail to capture the model's dynamics comprehensively. Based on the lag selection criteria, the optimal lag is found at lag 4, as indicated by the lowest values of both the AIC and HQIC.

Cointegration Test

The cointegration test is used to determine whether to proceed with a VAR or VECM model. The Johansen cointegration test relies on the Trace statistic, where the null hypothesis (H_0) is rejected if the Trace statistic exceeds the critical value at the 5% significance level.

Table 3. Cointegration Test

Rank	Trace Statistic	5% Critical value
0	206.7505	94.15
1	118.5271	68.52
2	56.1923	47.21
3	31.8816	29.68
4	14.3702	15.41

Source: Processed data by researcher (2024)

The Johansen test indicates that at rank 4, the Trace statistic (14.3702) is lower than the critical value (29.68), implying that the null hypothesis of no cointegration is accepted. This suggests the presence of four cointegrating relationships among the variables, indicating both short-run and long-run dynamics between GDP, M2, interest rate, exchange rate, inflation, and FDI. Hence, the VECM model is deemed appropriate for further analysis.

VECM Estimation Results

The Vector Error Correction Model (VECM), developed by Engle and Granger (1987), allows for the analysis of both short-run dynamics and long-run equilibrium relationships between variables (Gujarati, 2004 in Faisol & Sujianto, 2020). In the short-run estimation, the Error Correction Term (ECT) must be negative and statistically significant to confirm the system's ability to revert to long-run equilibrium following a short-term shock (Gujarati & Porter, 2009).

Table 4. Short-run VECM Estimation Results

Variabel	**coeficient**	**P> |z|**
ECT	-4.80834	0.000
GDP	2.642556	0.000
M2	0.0420183	0.545
Interest Rate	-0.1710147	0.683
Inflation	-0.0010029	0.000
Exchange Rate	0.1748124	0.000
FDI	0.0641161	0.000

Table 5. Long-run VECM Estimation Results

Variabel	**coeficient**	**P> |z|**
M2	0.0128777	0.846
Interest Rate	-0.1835051	0.025
Inflation	-0.000297	0.000
Exchange Rate	0.0699894	0.000
FDI	0.0165006	0.025

Table 6. Summary of VECM Estimation Results

Variabel	Short-run	Long-run
M2	Not significant	Not significant
Interest Rate	Not significant	significant
Inflation	significant	significant
Exchange Rate	significant	significant
FDI	significant	significant

Source: Processed data by researcher (2024)

The results indicate that M2 has no significant impact on GDP in both the short and long run. Interest rate is insignificant in the short run, implying a time lag effect, but shows a significant impact in the long run. Inflation has a negative and significant effect on GDP in both time frames, indicating that rising inflation reduces economic growth. Meanwhile, exchange rate depreciation and FDI have a positive and significant influence on GDP.

Impulse Response Function (IRF)

The IRF illustrates the response of GDP to a one-time, one-standard-deviation shock in each independent variable over time. A shock refers to an unexpected disturbance in M2, interest rate, inflation, exchange rate, or FDI.

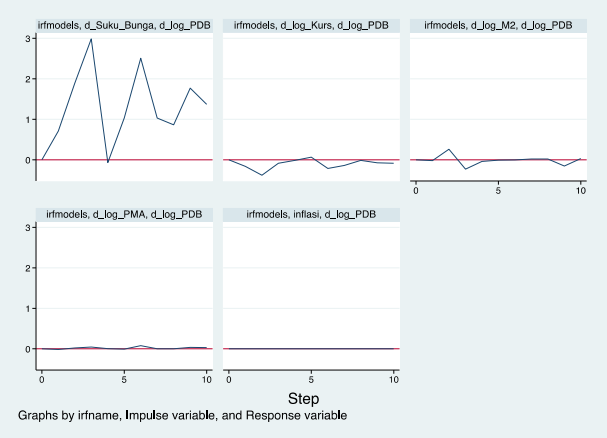

Figure 2. IRF Results

Table 7. IRF Results

Step	M2	IR	Inf	ER	FDI
0	0	0	0	0	0
1	-0.019902	0.71134	0.000425	-0.16172	-0.015224
2	0.260351	189.278	-0.0000096	-0.380539	0.020866
3	-0.22956	298.801	0.000058	-0.08606	0.045102
4	-0.040967	-0.067336	0.00002	-0.015016	0.003369
5	-0.007316	103.552	0.000276	0.06429	-0.007936
6	-0.002787	251.078	0.000145	-0.212448	0.078491
7	0.019184	103.289	0.000014	-0.139273	-5.2E-07

Step	M2	IR	Inf	ER	FDI
8	0.018747	0.862595	0.000121	-0.014524	-0.000293
9	-0.154203	177.066	0.000148	-0.074934	0.036191
10	0.030699	137.004	0.000173	-0.084617	0.030776

Source: Processed data by researcher (2024)

The IRF results suggest that a shock to M2 does not immediately affect GDP, although noticeable fluctuations emerge after several periods. Interest rate shocks have a substantial and persistent impact on GDP in both the short and long run. Inflation shocks yield a minimal effect throughout the period. Exchange rate shocks initially exert a negative effect on GDP, with persistent fluctuations thereafter. FDI shocks have a gradually increasing positive effect on GDP over time.

Forecast Error Variance Decomposition (FEVD)

FEVD analysis is used to quantify the contribution of each independent variable to the forecast error variance of the dependent variable (GDP). It provides insight into the extent to which each variable explains fluctuations in GDP over time.

Table 8. FEVD Results

Step	M2	IR	Inf	ER	FDI
0	0	0	0	0	0
1	0	0	0	0	0
2	0.037582	0.004261	0.671511	0.020461	0.001228
3	0.035302	0.011634	0.561906	0.162891	0.002886
4	0.044145	0.157869	0.454523	0.134245	0.008567
5	0.041748	0.145139	0.417682	0.123158	0.007878
6	0.035101	0.139703	0.466049	0.106361	0.006777
7	0.026444	0.128675	0.461557	0.119868	0.016437
8	0.027161	0.130876	0.456106	0.125169	0.016202
9	0.024914	0.125814	0.436045	0.114816	0.014853
10	0.027912	0.130257	0.4424	0.108712	0.015389

Source: Processed data by researcher (2024)

In step 2, M2 contributes approximately 3.76% to GDP variability, which slightly decreases to 2.79% in step 10. The interest rate contributes around 0.43% initially, increasing steadily to 13.03% by step 10. Exchange rate contributions rise from 2.05% to 10.87% during the same period. Inflation contributes the most to GDP variability, starting at 67.15% and declining to 44.24% by step 10. FDI's contribution is initially minimal (0.12%) but increases to around 1.54% at step 10.

Discussion

The Impact of M2 on GDP: Indication of a Liquidity Trap

M2 serves as one of the indicators of monetary policy, whereby changes in M2 are expected to influence economic growth. However, the findings of this study indicate that variations in M2 do not significantly affect the growth of Gross Domestic Product (GDP). The results of the Impulse Response Function (IRF) show that a shock to M2 does not have a substantial impact on GDP, although a positive effect begins to appear after several periods. Meanwhile, the Forecast Error Variance Decomposition (FEVD) indicates that M2 contributes only marginally to the variability of GDP. In the long run, GDP variation is explained more by other variables than by M2. This suggests the presence of a liquidity trap, where monetary policy becomes ineffective in stimulating economic growth despite an increase in money supply or a reduction in interest rates.

A liquidity trap may occur when economic agents prefer to hold onto their money rather than spend or invest it. Moreover, an increase in M2 can trigger inflation, especially when it is not accompanied by a corresponding increase in the output of goods and services. High inflation can erode purchasing power and raise production costs, thus limiting the positive effect of increased money supply on GDP. This is supported by Amaral et al. (2022), who found that a continuous rise in M2 leads to long-term inflation. According to the quantity theory of money, when the velocity of money (V) is constant and output (Q) does not grow rapidly, an increase in M2 will primarily lead to inflation rather than real economic growth. However, in real-world economies, the velocity of money is subject to change depending on prevailing economic conditions. Changes in money demand may influence the circulation

speed of money, rendering the assumption of a constant V invalid. During financial crises or shifts in public preference for liquidity, the velocity of money can change significantly.

Irving Fisher argued that the velocity of money is determined by institutional factors within an economy, which influence individual transaction behaviors (Mishkin, 2016). Falitho Alam et al. (2020) also found that M2 does not have a significant effect on real GDP. Similarly, Razia & Omarya (2022) concluded that M2 has no significant long-term impact on GDP growth.

The Impact of Interest Rate on GDP: Indication of a Time Lag

Interest rate is a key monetary policy variable that influences economic growth through its effects on investment and consumption. However, in the short term, interest rate changes do not significantly affect GDP. This can be attributed to the time lag in the transmission of monetary policy—changes in interest rates require time to affect the real

sector. Therefore, the impact of interest rate adjustments may not be immediately observable.

The IRF results show that a shock to interest rates leads to an increase in GDP in the short run. This may reflect the delayed transmission of monetary policy in Indonesia's money market, where a rise in interest rates temporarily attracts capital inflows. However, in the long term, higher interest rates tend to raise expectations of increased borrowing costs, prompting economic agents to adjust their investment and consumption strategies sooner. This supports the negative long-term relationship between interest rates and GDP growth. The IRF results also reveal that interest rate shocks exert a negative effect on GDP over the long run. These findings align with the IS-LM model, which suggests that higher interest rates raise borrowing costs, thus reducing consumption and investment. The initial positive response may result from market adjustments to tighter monetary policies, where market participants seek to capitalize on current conditions before further increases in borrowing costs occur.

This is in line with investment theories which state that rising interest rates reduce investment and consumption (Mishkin, 2016). Hence, high interest rates may lead to declining investment, ultimately dampening economic growth. These findings are consistent with studies conducted by El-Khodary (2024) and Maitah et al. (2024), which also found that interest rates negatively affect economic growth.

The Impact of Exchange Rate on GDP: Evidence of the Marshall-Lerner Condition

The exchange rate has a positive influence on GDP in both the short and long term. A higher exchange rate (i.e., depreciation of the domestic currency) tends to boost GDP, as depreciation of the Rupiah relative to the US Dollar makes Indonesian goods and services cheaper for foreign buyers, thereby stimulating exports and promoting economic growth. This finding is consistent with the Marshall-Lerner condition, which posits that currency depreciation can improve net exports and subsequently increase GDP. When the Rupiah depreciates, export prices in dollar terms decline, thereby increasing export volumes and contributing to GDP growth.

IRF results show that in the initial period, GDP responds negatively to exchange rate depreciation due to rising import costs, which may burden import-dependent firms. However, in the long run, exchange rate depreciation yields a positive response as the economy adjusts to increased domestic production and improved export competitiveness. The FEVD results reveal that the exchange rate initially has a low contribution to GDP variability, but this contribution increases over time—indicating that the impact of depreciation becomes more pronounced as the economy adapts. This is consistent with the export trends observed in the post-COVID-19 period. Supporting studies by Dong, 2017;

Igue & Ogunleye, (2014) ; and Yazgan & Ozturk, (2019) also show that exchange rate depreciation can enhance the trade balance, ultimately driving GDP growth.

The Impact of Inflation and FDI on GDP: Effects of Inflation and FDI Fluctuations

Inflation negatively affects GDP in both the short and long term. High long-term inflation creates uncertainty in the economy, making it difficult for producers to plan and operate due to rising costs. This discourages long-term investment. Studies by Maitah et al., (2024); Simanungkalit, (2020); Wiriani & Mukarramah, 2020) also confirm that inflation has a significant negative impact on economic growth, largely due to reduced economic activity among market participants.

IRF results show that GDP exhibits a minimal response to inflation shocks in the short term, suggesting that inflation does not immediately impact GDP. This may be due to lagged adjustments in economic policy that help mitigate inflation's effects. However, the FEVD indicates that inflation is a major contributor to GDP variability, highlighting its role as a primary source of economic instability. Over time, this contribution diminishes as the economy adapts to inflationary pressures through wage adjustments, pricing strategies, and monetary policy interventions by the central bank.

Foreign Direct Investment (FDI) positively influences economic activity in both the short and long term, as foreign capital inflows enhance production capacity, generate employment, and facilitate technology transfer. Thus, increasing FDI contributes directly to Indonesia's economic growth. IRF results show that GDP initially responds negatively to FDI shocks at the first step, indicating an adjustment period. However, from subsequent steps through the tenth period, GDP responds positively, suggesting that FDI requires time to exert a significant influence on the economy.

FEVD results reveal that FDI has a minimal contribution to GDP variability in the early periods. This low initial contribution implies that other variables—such as interest rates, inflation, or exchange rates—play a more dominant role in driving GDP fluctuations at the outset. However, the increasing contribution of FDI over time demonstrates its growing impact on economic growth. Supporting studies by Fadhil & Almsafir, (2015); Iamsiraroj, (2016) also find a positive relationship between FDI and economic growth.

Policy Implications: Integrating Monetary Variables and FDI for Indonesia's Economic Growth

The combination of monetary variables and FDI plays a crucial role in promoting economic growth in Indonesia. The goal is to create a stable and conducive economic environment that attracts investors, ultimately supporting economic growth through increased investment, job creation, and enhanced production capacity. Keynesian and

monetarist theories emphasize the importance of monetary policy in controlling inflation and maintaining economic stability. Price stability and low interest rates can encourage economic agents to engage in productive activities. The Mundell-Fleming model also underscores the importance of exchange rate stability in an open economy, particularly in maintaining export competitiveness and increasing export volumes. Well-calibrated monetary policy enhances the attractiveness of FDI and supports sustainable economic growth.

FDI contributes to Indonesia's economic development by expanding production capacity, transferring technology, and generating employment opportunities. Foreign capital inflows also improve infrastructure and strengthen linkages between local and global markets. Yurioputra, (2022) found that FDI from the Indonesia Investment Authority (INA) positively impacts Indonesia's economic growth. Fitriandi et al. (2014) also found that provinces with smaller governments tend to attract more FDI, as infrastructure needs in such regions are more rapidly addressed. These findings highlight the importance of leveraging private investment through various policy schemes.

Stable monetary policy fosters a favorable business climate for foreign investors, while FDI, in turn, supports the achievement of monetary policy objectives—such as controlling inflation through enhanced productivity. This synergy fosters sustainable economic growth by generating employment, increasing production capacity, and strengthening global market integration.

Conclusion

This research is able to explain how the movements of variables such as M2, interest rate, inflation, exchange rate, and Foreign Direct Investment (FDI) affect Indonesia's Gross Domestic Product (GDP). The findings show that M2 has no significant effect on GDP, indicating the presence of a liquidity trap, where monetary policy fails to stimulate economic growth despite an increase in money supply.

Furthermore, it was found that interest rates have a time lag effect, meaning that in the short term, their influence requires adjustment and only becomes apparent in the long term. The study also identifies the presence of the Marshall-Lerner condition in Indonesia's economy, where currency depreciation positively impacts GDP by boosting exports.

Inflation has a negative effect on GDP growth, as high inflation rates reduce both consumption and investment, leading to a decline in GDP. Meanwhile, FDI has a positive effect on GDP in both the short and long term by increasing production capacity, facilitating technology transfer, and creating employment.

Therefore, effective monetary policy is crucial to support GDP growth. Indonesia needs to strengthen its FDI inflows through structural reforms in key sectors and ensure

macroeconomic stability to attract foreign investors. Thus, a combination of effective monetary policy and increased inflow of foreign direct investment can foster more sustainable economic growth in Indonesia.

References

Aji Prihatin, W., Arintoko, & Suharno. (2019). ANALISIS PENGARUH VARIABEL-VARIABEL MONETER TERHADAP PERTUMBUHAN EKONOMIINDONESIA. Jurnal Ekonomi, Bisnis, Dan Akuntansi (JEBA), 21.

Altig, D., Baker, S., Barrero, J. M., Bloom, N., Bunn, P., Chen, S., Davis, S. J., Leather, J., Meyer, B., Mihaylov, E., Mizen, P., Parker, N., Renault, T., Smietanka, P., & Thwaites, G. (2020). Economic uncertainty before and during the COVID-19 pandemic. Journal of Public Economics, 191. https://doi.org/10.1016/J.JPUBECO.2020.104274

Amaral, A., Dyhoum, T. E., Abdou, H. A., & Aljohani, H. M. (2022). Modeling for the Relationship between Monetary Policy and GDP in the USA Using Statistical Methods. Mathematics, 10(21). https://doi.org/10.3390/math10214137

Asnawi, A., & Fitria, H. (2018). PENGARUH JUMLAH UANG BEREDAR,TINGKAT SUKU BUNGA DAN INFLASI TERHADAP PERTUMBUHAN EKONOMI DI INDONESIA. JURNAL EKONOMIKA INDONESIA, 7(1), 24–32. https://doi.org/10.29103/EKONOMIKA.V7I1.1129

Budiyanto, V., & Wibowo, W. (2021). PENGARUH KEBIJAKAN MONETER TERHADAP PERTUMBUHAN EKONOMI. Jurnal Ilmiah Manajemen, Ekonomi, & Akuntansi (MEA), 5(1), 988–999. https://doi.org/10.31955/MEA.V5I1.876

Buthelezi, E. M. (2023). Impact of Money Supply in Different States of Inflation and Economic Growth in South Africa. Economies, 11(2). https://doi.org/10.3390/economies11020064

Case, K. E., Fair, R. C., & Oster, S. E. (2017). Principles of macroeconomics. Pearson.

Dong, F. (2017). Testing the Marshall-Lerner condition between the U.S. and other G7 member countries. North American Journal of Economics and Finance, 40, 30–40. https://doi.org/10.1016/j.najef.2017.01.003

EL-KHODARY, M. (2024). The Impact of Money Supply, Interest Rate and Inflation Rate on Economic Growth: A Case of Morocco. Journal of Economics, Finance and Accounting Studies , 6(2), 132–142. https://doi.org/10.32996/JEFAS.2024.6.2.10

Fadhil, M. A., & Almsafir, M. K. (2015). The Role of FDI Inflows in Economic Growth in Malaysia (Time Series: 1975-2010). Procedia Economics and Finance, 23, 1558–1566. https://doi.org/10.1016/s2212-5671(15)00498-0

Falitho Alam, R., Hayati, B., & Mas'ud, F. (2020). ANALISIS KETERKAITAN ANTARA JUMLAH UANG BEREDAR DAN PDB RIIL INDONESIA (PERIODE 2010.1-

2018.12). DIPONEGORO JOURNAL OF ECONOMICS, 9, 1–13. https://doi.org/https://doi.org/10.14710/djoe.31565

Fazaaloh, A. M. (2024). Kointegrasi dan Model ECM (VECM).

Fitriandi, P., Kakinaka, M., & Kotani, K. (2014). Foreign direct investment and infrastructure development in Indonesia: Evidence from province level data. http://aessweb.com/journal-detail.php?id=5004

Iamsiraroj, S. (2016). The foreign direct investment-economic growth nexus. International Review of Economics and Finance, 42, 116–133. https://doi.org/10.1016/j.iref.2015.10.044

Igue, N. N., & Ogunleye, T. S. (2014). Impact of Real Exchange Rate on Trade Balance in Nigeria.

Jui, F. N., Hossain, M. J., Das, A., Sultana, N., & Islam, M. K. (2024). Analyzing the impact of remittance, FDI and inflation rate on GDP: A comparative study of Bangladesh, Pakistan and Sri-Lanka using VAR and BEKK-GARCH approach. Heliyon, 10(11), e31381. https://doi.org/10.1016/J.HELIYON.2024.E31381

Krugman, P. R., Obstfeld, M., & Melitz, M. J. (2020). International Economics:Theory and Policy. www.myeconlab.com

Kunwar, S., Timilsina, S., Nepal, S., Shrestha, P., Shrestha, A., & Gahatraj, M. (2023). Impact of Money Supply and Inflation on Economic Growth in Nepal. The Lumbini Journal of Business and Economics, 11(1), 381–396. https://doi.org/10.3126/LJBE.V11I1.54343

Magazzino, C., & Mele, M. (2022). Can a change in FDI accelerate GDP growth? Time-series and ANNs evidence on Malta. The Journal of Economic Asymmetries, 25, e00243. https://doi.org/10.1016/J.JECA.2022.E00243

Maitah, M., Malec, K., Rojik, S., Aragaw, A., & Fulnečková, P. R. (2024). Inflation, exchange rate, and economic growth in Ethiopia: a time series analysis. International Review of Economics & Finance, 103561. https://doi.org/10.1016/j.iref.2024.103561

Mankiw, N. G. (2016). macroeconomics. Worth Publishers.

Mishkin, F. S. M. (2016). The economic of money, banking, and financial market.

Razia, A., & Omarya, M. (2022). The Impact of the Broad Money Supply (M2) on Economic Growth per Capita in Palestine. International Journal of Business Ethics and Governance, 5(2), 1–10. https://doi.org/10.51325/ijbeg.v5i2.86

Ryndaman Wachyudi, R., Aqilah Triana, T., & Arini, Z. (2024). PENGARUH PRODUK DOMESTIK BRUTO, SUKU BUNGA, DAN INFLASI TERHADAP JUMLAH UANG BEREDAR DI INDONESIA SELAMA PANDEMI COVID-19. Neraca: Jurnal Ekonomi, Manajemen Dan Akuntansi, 2(10), 584–597–584–597. http://jurnal.kolibi.org/index.php/neraca/article/view/2628

Salam, R. D. L., & Basuki, P. (2023). Simultaneous Equation: The Case of Inflation & Rupiah Exchange Rate in Indonesia 2001-2022. INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS, 06(12). https://doi.org/10.47191/ijmra/v6-i12-12

Satria, D. (2018). Modul vecm stata.

Simanungkalit, E. F. B. (2020). PENGARUH INFLASI TERHADAP PERTUMBUHAN EKONOMI DI INDONESIA (Vol. 13, Issue 3).

Sukirno, S. (2015). Mikroekonomi Teori Pengantar (3rd ed.). RajawaliPers.

Wiriani, E., & Mukarramah. (2020). Pengaruh Inflasi dan Kurs terhadap Pertumbuhan Ekonomi Indonesia. Jurnal Samudra Ekonomika, 4(1), 41–50. https://doi.org/10.0123/JSE.V4I1.2222

Yazgan, M. E., & Ozturk, S. S. (2019). Real Exchange Rates and the Balance of Trade: Does the J-curve Effect Really Hold? Open Economies Review, 30(2), 343–373. https://doi.org/10.1007/s11079-018-9510-3

Yurioputra, A. D. (2022). IMPACT OF FOREIGN DIRECT INVESTMENT OF INDONESIA INVESTMENT AUTHORITY ON ECONOMIC GROWTH: STRENGTHENING NATIONAL ECONOMIC RECOVERY TO OVERCOME GLOBAL RECESSION IN 2023.

Zeynalova, A. (2024). The impact of credit volume on money supply and economic growth in Azerbaijan: an econometric analysis. Multidisciplinary Science Journal, 6(1), 2024004–2024004. https://doi.org/10.31893/MULTISCIENCE.2024004