



Impact of Macroeconomic Indicators on The Indonesia Stock Exchange (IDX) Composite Index Performance

Widhiyaffa Akbariaza

School of Business and Management, Bandung Institute of Technology

ABSTRACT: This study examines the impact of macroeconomic indicators on the performance of the Indonesia Stock Exchange (IDX) Composite Index from 2014 to 2023, focusing on four key variables: interest rates, inflation, money supply (M2), and Gross Domestic Product (GDP). Using a Vector Autoregressive (VAR) model, the research investigates the short-term dynamics between these variables. The findings show that in the VAR estimation, only the lag 1 M2 value has a statistically significant coefficient. However, the Impulse Response Function (IRF) analysis reveals that shocks to the Bank Indonesia rate, inflation, money supply, and GDP initially cause significant fluctuations in the Jakarta Stock Exchange price index, but these effects are short-lived, with the index stabilizing around zero after several periods. These results provide valuable insights for policymakers and investors, emphasizing the importance of understanding macroeconomic conditions for making informed stock market decisions.

KEYWORDS: Impulse Response Function, Indonesia Stock Exchange, Macroeconomic Indicators, Vector Autoregressive.

INTRODUCTION

The stock market serves as a critical mechanism for capital formation and investment, providing a platform for companies to raise funds by issuing shares and for investors to engage in the buying and selling of these shares. The stock market comprises two primary segments: the primary market, where new securities are issued, and the secondary market, where previously issued securities are traded among investors. Stock exchanges such as the New York Stock Exchange (NYSE), Nasdaq, and the Indonesia Stock Exchange (IDX) serve as regulated marketplaces ensuring transparency and fair trading practices. One significant measure of stock market performance is through stock indices, which aggregate selected stocks to provide an overview of market trends. In Indonesia, the Jakarta Stock Exchange Composite Index (JKSE) functions as a key benchmark, reflecting the performance of all stocks listed on the IDX. The index, which is market capitalization-weighted and adjusted for free float, provides a comprehensive snapshot of the Indonesian stock market.

Over the past decade, the JKSE has exhibited substantial volatility, driven by factors such as fluctuations in U.S. Federal Reserve interest rates, domestic economic conditions, and global market dynamics. Such fluctuations underscore the influence of macroeconomic indicators on stock market performance. Existing theories, such as the Dow Theory, the Efficient Market Hypothesis (EMH), and Arbitrage Pricing Theory (APT) suggest that stock prices are influenced by broader economic conditions and reflect all available information, including macroeconomic indicators such as interest rates, inflation rates, and currency exchange rates. Despite extensive research on the relationship between macroeconomic indicators and stock market performance, there remain significant gaps and conflicting findings, particularly regarding the effects of interest rates and inflation on stock prices. Some studies find that these indicators significantly impact stock prices, while others yield inconclusive or contradictory results. This discrepancy highlights the need for further investigation, especially in the context of emerging markets like Indonesia.

Purpose of the Study

This study aims to analyze the impact of various macroeconomic indicators on the performance of the IDX Composite Index. By examining indicators such as interest rates, currency exchange rates, inflation rates, and money supply, this research seeks to clarify the specific effects these variables have on stock price movements within the Indonesian market. By addressing the existing gaps in the literature, this study contributes to a deeper understanding of how macroeconomic factors influence stock market performance. The findings will provide valuable insights for investors looking to optimize their portfolios and for government agencies responsible for formulating economic policies that support stock market stability and economic growth.



Research Questions and Objectives

The central research questions guiding this study are:

1. What macroeconomic indicators significantly influence the performance of the IDX Composite Index?
2. How do these indicators impact stock prices in Indonesia?
3. What are the implications of these findings for investment strategies and government policy?

Through these questions, the research will provide a detailed analysis of the interaction between macroeconomic factors and stock market performance, offering practical applications for both investors and policymakers.

METHODOLOGY

This research employs a quantitative approach to analyze the impact of macroeconomic indicators on the performance of the Indonesia Stock Exchange Composite Index (JKSE). The study utilizes secondary data obtained from various reputable sources, including Bank Indonesia, the Central Bureau of Statistics (Badan Pusat Statistik), and Yahoo Finance, focusing on data from the first quarter of 2014 to the last quarter of 2023

Research Design and Variables

The research design is structured to achieve the study's objectives through a systematic approach. The process begins with the identification of research gaps based on the literature review, followed by data collection and analysis. The study specifically examines how macroeconomic indicators, such as interest rates, inflation, money supply (M2), and GDP, influence the JKSE closing price, which represents the dependent variable. The study focuses on two types of variables: dependent and independent. The dependent variable is the quarterly closing price of the JKSE. The independent variables are macroeconomic indicators including the Bank Indonesia (BI) interest rate, inflation rate, money supply (M2), and real GDP. These variables were chosen based on their theoretical relevance and availability of quarterly data. Some indicators, such as the unemployment rate and industrial production, were excluded due to data limitations and fractional representation of economic activity.

Data Source and Time Dimension

Secondary data is employed for this study, collected from official and publicly available sources. The dependent variable data was sourced from Yahoo Finance, while the independent variable data was obtained from the Bank Indonesia database and the Badan Pusat Statistik website. The use of secondary data enables the examination of the relationships between macroeconomic indicators and stock market performance. The data collected spans from the first quarter of 2014 to the last quarter of 2023, reflecting significant economic and financial events in Indonesia during this period. Quarterly data was selected to provide a comprehensive overview of the economic dynamics and to ensure consistency in the analysis.

Data Analysis Method

The research employs a Vector Autoregressive (VAR) model to analyze the dynamic relationships between the macroeconomic indicators and the JKSE closing price. The VAR model is suitable for capturing the linear interdependencies among multiple time series variables and is commonly used in econometrics and financial analysis.

Stationarity Test: The Augmented Dickey-Fuller (ADF) test is used to assess whether the time series data are stationary. If the data are found to be non-stationary, they will be transformed using first differences to achieve stationarity.

Optimal Lag Selection: To determine the appropriate number of lags for the VAR model, the study uses several statistical criteria, including the Akaike Information Criterion (AIC), Schwarz-Bayesian Information Criterion (SBIC), and Hannan-Quinn Information Criterion (HQIC).

VAR Estimation: Once the data conditions and optimal lags are established, the VAR model is estimated to analyze the impact of the independent variables' past values on the current JKSE closing price.

Model Diagnostics: The stability of the VAR model is tested using eigenvalue stability conditions. Residual diagnostics, including the Portmanteau Test and the Jarque-Bera test, are applied to ensure the absence of autocorrelation and normality in the residuals.

Impulse Response Function (IRF): The IRF is utilized to track the effects of a one-time shock to one of the independent variables on the current and future values of the JKSE closing price, providing insights into the dynamic interactions between the variables.



This comprehensive methodology ensures that the study effectively captures the influence of macroeconomic indicators on stock market performance in Indonesia, providing valuable insights for both investors and policymakers.

RESULTS AND DISCUSSION

The study utilized a Vector Autoregressive (VAR) model to assess the dynamic relationships between macroeconomic indicators and the Jakarta Stock Exchange (JKSE) Composite Index. Below are the summarized findings and discussions based on the analysis.

Stationarity Test and Optimal Lag

The Augmented Dickey-Fuller (ADF) tests revealed that all variables, including BI Rate, Inflation Rate, M2 (Money Supply), GDP, and JKSE Price, were non-stationary at their levels. However, after first differencing, all variables became stationary, indicating that they are integrated of order one, I(1). The optimal lag length for the VAR model was determined to be two lags based on criteria such as the Akaike Information Criterion (AIC) and the Schwarz-Bayesian Information Criterion (SBIC). This lag length provided a stable model for capturing the dynamics among the variables.

Table I. Dickey Fuller Result

Variables	Levels	1st Differences
BI Rate	p-value	p-value
None	0.5092	0.0028
Intercept	0.0650	0.0003
Trend & Intercept	0.9838	0.0079
Inflation Rate	p-value	p-value
None	0.0850	0.0000
Intercept	0.0060	0.0000
Trend & Intercept	0.2203	0.0000
M2	p-value	p-value
None	0.9835	0.0000
Intercept	0.6748	0.0000
Trend & Intercept	0.5339	0.0000
GDP	p-value	p-value
None	0.9395	0.0000



Intercept	0.2391	0.0000
Trend & Intercept	0.0634	0.0000
JKSE Price	p-value	p-value
None	0.8425	0.0000
Intercept	0.0723	0.0000
Trend & Intercept	0.2483	0.0000

Table II. Optimal Lag Selection

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-914.212				4.50E+16	52.5264	52.6031	52.7486
1	-885.406	57.612	25	0	3.70E+16	52.3089	52.7691	53.6421
2	-852.224	66.363	25	0	2.50E+16	51.8414	52.6851	54.2855
3	-830.163	44.122	25	0.011	3.80E+16	52.0093	53.2365	55.5644

VAR Estimation Result

The VAR estimation found that:

BI Rate, Inflation Rate, and GDP: The coefficients for these variables were not statistically significant across the lags, indicating that changes in the BI Rate, inflation, and GDP did not have a direct short-term impact on the JKSE Price within the model's timeframe.

Money Supply (M2): A significant positive relationship was observed between M2 and the JKSE Price at the first lag, suggesting that increases in the money supply positively influence stock prices in the short term, likely due to enhanced liquidity in the economy.

Table III. VAR Result

Variable	Coefficient	Std. err.	z	P> z	95% conf. interval
d_JKSEPrice					
L1	0.030914	0.159475	0.19	0.846	-0.281651 - 0.343495
L2	-0.09873	0.166273	-0.59	0.553	-0.4246166 - 0.2271617



d_BIRate						
L1	-11257.5	17691.71	-0.64	0.525	-45932.62	-23417.62
L2	13891.46	17765.64	0.78	0.434	-20928.56	-48711.49
d_InflationRate						
L1	-1084.23	6104.769	-0.18	0.859	-13049.35	-10880.9
L2	-8666.74	5917.987	-1.46	0.143	-20265.78	-2932.304
d_M2						
L1	0.001127	0.000508	2.22	0.026	0.0001326	-0.002122
L2	0.000359	0.0006	0.6	0.55	-0.0008178	-0.0015351
d_GDP						
L1	0.002055	0.001274	1.61	0.107	-0.0004412	-0.0045508
L2	-0.00169	0.001091	-1.08	0.327	-0.003207	-0.0019335
cons.						
	-159.275	142.6491	-1.12	0.264	-438.8616	-120.3125

VAR Stability and Residual Diagnostics

Eigenvalue Stability Condition: The eigenvalues of the VAR model were all found to have moduli less than one, indicating that the model satisfies the stability condition. This ensures that the time series data will not exhibit explosive behavior and that the model's predictions will converge over time.

Ljung-Box Test for Residual Autocorrelation: The Ljung-Box test results for both lags indicated that there was no significant autocorrelation in the residuals, with p-values greater than 0.05 for both lags. This suggests that the residuals of the model are independently distributed and the model is correctly specified.

Jarque-Bera Test for Normality: The Jarque-Bera test indicated that the residuals for the JKSE Price do not follow a normal distribution, as the p-value was less than 0.05. However, given the Central Limit Theorem, this lack of normality may not significantly affect the validity of the model's parameter estimates, especially with a large sample size.

Table IV. Eigenvalue Stability Condition

Eigenvalue	Modulus
$-0.00107294 + .8707215i$.870722
$-0.00107294 - .8707215i$.870722



-0.6554427	0.655443
.5889201	.58892
.2864098 + .5000846i	.576294
.2864098 - .5000846i	.576294
-.4802076 + .3130338i	.573227
-.4802076 - .3130338i	.573227
.2472749	.247275
-.1829915	.182992

Table V. Ljung-box Test Result

lag	chi2	df	Prob > chi2
1	7.618	5	0.179
2	4.30543	5	0.506

Table VI. Jarque-Bera Test Result

Equation	chi2	df	Prob > chi2
d_JKSEPrice	71.452	2	0

Impulse Response Function (IRF)

The IRF analysis provided deeper insights into the effects of shocks to the macroeconomic variables on the JKSE Price:

BI Rate: A shock to the BI Rate initially caused a small negative impact on stock prices, followed by a brief positive response before stabilizing near zero. This suggests that while changes in interest rates may initially depress stock prices, their effects are short-lived.

Inflation Rate: A shock in inflation initially led to a decline in the JKSE Price, but the effect reversed in subsequent periods, eventually turning positive before stabilizing. This reflects market adaptation to inflation shocks.

Money Supply: A positive shock to the money supply initially boosted stock prices, but this effect quickly diminished and turned negative, stabilizing near zero over time. This suggests that while increased liquidity benefits the stock market in the short term, its effect is not sustained.

GDP: The response to a shock in GDP was initially positive but fluctuated between negative and positive values in subsequent periods, indicating short-term volatility in stock market performance following changes in GDP.

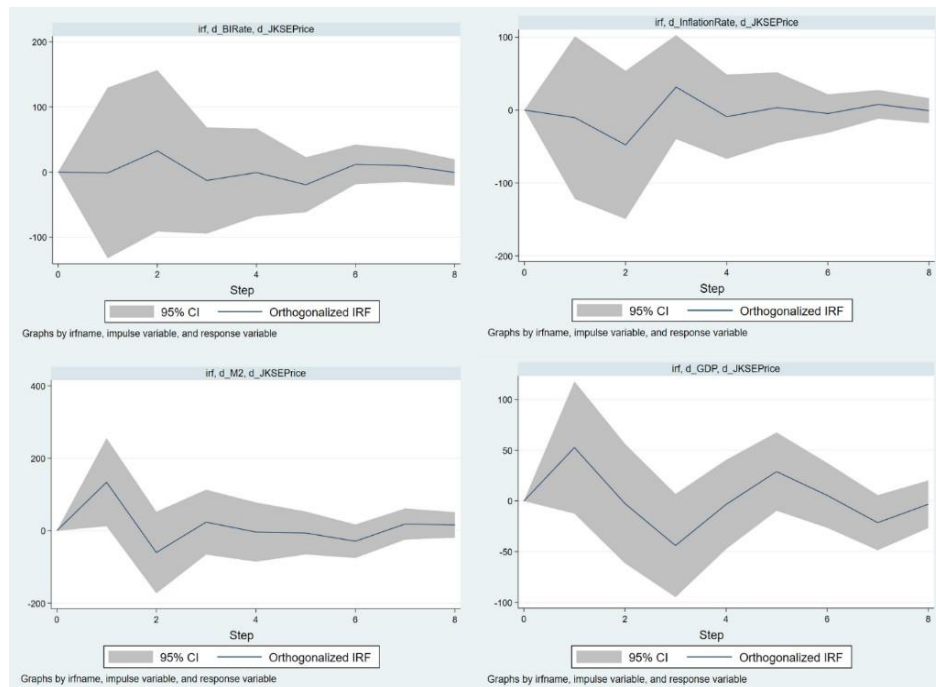


Figure 1. Impulse Response Function

Practical Implication

The study's findings have practical implications for investors and policymakers:

Investors: The positive correlation between money supply and stock prices suggests that investors could benefit from expansionary monetary policies by increasing their equity exposure. Monitoring GDP trends could also provide insights into stock market performance, especially in sectors benefiting from economic growth.

Policymakers: The IRF results provide valuable insights into the timing and magnitude of economic shocks on stock prices. Understanding these dynamics enables policymakers to better time monetary and fiscal interventions to stabilize markets and support growth while minimizing unintended disruptions.

Overall, the study highlights the complex and dynamic nature of the relationships between macroeconomic indicators and stock market performance, emphasizing the importance of liquidity (money supply) in driving short-term stock price movements while acknowledging the volatility associated with interest rates, inflation, and GDP changes.

CONCLUSION

This study aimed to investigate the dynamic relationship between macroeconomic indicators and the Jakarta Stock Exchange (JKSE) Composite Index, focusing on how variables such as interest rates, inflation, money supply, and GDP affect stock market performance in Indonesia. By employing a Vector Autoregressive (VAR) model, the study was able to capture the short-term interactions between these macroeconomic factors and the stock index.

The findings revealed that, among the indicators examined, the money supply (M2) showed a significant positive short-term effect on the JKSE Price. This suggests that increased liquidity in the economy can boost stock prices, albeit temporarily. On the other hand, variables such as the BI Rate, inflation rate, and GDP did not demonstrate statistically significant impacts on the JKSE Price within the study's timeframe. The impulse response function (IRF) analysis further highlighted the transient nature of the effects of shocks to these macroeconomic variables, with responses typically stabilizing after a few periods.

For investors, the positive correlation between money supply and stock prices implies that expansionary monetary policies may present opportunities to increase equity exposure. Monitoring trends in GDP and other macroeconomic indicators can also provide valuable insights for investment strategies, especially during periods of economic growth.



Policymakers can utilize these findings to better understand the timing and magnitude of economic shocks on stock market performance. This understanding allows for more targeted interventions through monetary and fiscal policies, ensuring that actions taken to stabilize the economy or stimulate growth are both timely and effective in minimizing market disruptions.

In conclusion, this study underscores the importance of liquidity in driving short-term stock market performance while recognizing the complexities and volatilities associated with other macroeconomic factors. Future research could further explore these relationships over longer time horizons or in different market contexts to provide a more comprehensive understanding of macroeconomic influences on stock markets.

REFERENCES

1. Beck, T., & Levine, R. (2001). Stock markets, banks, and growth: Correlation or causality.
2. Chen, N. F., Roll, R., & Ross, S. A. (1986). Economic forces and the stock market. *Journal of Business*, 59(3), 383-403. <https://doi.org/10.1086/296344>
3. Dow, C. H. (1900). *Dow's theory: The foundation of technical analysis*.
4. Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance*, 25(2), 383-417. <https://doi.org/10.2307/2325486>
5. Fama, E. F. (1981). Stock returns, real activity, inflation, and money. *American Economic Review*, 71(4), 545-565.
6. Gujarati, D. N. (2003). *Basic econometrics* (4th ed.). McGraw-Hill/Irwin.
7. Hamilton, J. D. (1994). *Time series analysis*. Princeton University Press. <https://doi.org/10.1515/9780691218632>
8. Lütkepohl, H. (2005). *New introduction to multiple time series analysis*. Springer.
9. Mackey, A., & Gass, S. M. (2005). *Second language research: Methodology and design*. Routledge.
10. Mankiw, N. G. (2020). *Principles of economics* (9th ed.). Cengage Learning.
11. Mishkin, F. S. (2019). *The economics of money, banking, and financial markets* (12th ed.). Pearson.
12. Mishkin, F. S., & Eakins, S. G. (2018). *Financial markets and institutions* (9th ed.). Pearson.
13. Mohtadi, H., & Agarwal, S. (2007). Stock market development and economic growth: Evidence from developing countries.
14. Ross, S. A. (1976). The arbitrage theory of capital asset pricing. *Journal of Economic Theory*, 13(3), 341-360.
15. Tulcanaza-Prieto, A. B. (2019). Determinants of stock market performance: VAR and VECM designs in Korea and Japan. *Global Business Review*, 24, 24-44. <https://doi.org/10.17549/gbfr.2019.24.4.24>