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The Impact of Inflation, Interest Rates, and Exchange Rates on the Jakarta Composite Index

Eric[1], Khoirul Hikmah[1*]

[1]Universitas Pembangunan Nasional Veteran Yogyakarta, Indonesia

*Email: khoirul.hikmah@upnyk.ac.id

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Abstract

This study aims to analyze the response of the Jakarta Composite Index (JCI) to macroeconomic variables, namely inflation, interest rates, and exchange rates, during the 2018–2024 period. Understanding the relationship between these variables is crucial for investors, policymakers, and financial analysts in making informed decisions regarding stock market movements in Indonesia. The research utilizes secondary data on JCI, inflation, interest rates, and exchange rates sourced from Bank Indonesia and the Indonesia Stock Exchange. The data is analyzed using the Vector Error Correction Model (VECM) to capture short-term and long-term dynamics. The findings indicate that inflation and interest rates do not significantly influence JCI, suggesting that stock market participants may have already factored in these macroeconomic variables. Meanwhile, exchange rates demonstrate a significant positive long-term effect on JCI, implying that currency fluctuations are crucial in shaping stock market performance. These results provide valuable insights into the interplay between macroeconomic indicators and the stock market, highlighting the importance of exchange rate stability in fostering a favorable investment climate.

Keywords : Exchange rates, inflation, interest rates, jakarta composite index, vector error correction model.

1. Introduction

Global economic uncertainty necessitates a comprehensive understanding of both global and domestic economic trends. As a developing country, Indonesia is highly vulnerable to economic crises. Therefore, understanding macroeconomic indicators and monetary policies is crucial for ensuring future economic stability. One of the key indicators in assessing a nation's economic condition is the stock market, which reflects both economic stability and investor confidence.

The stock market plays a vital role in evaluating business sector growth and serves as a reference for shaping economic policies. According to Sari & Az Zakiyyah (2024), the stock market contributes to economic stability by influencing fiscal and monetary strategies. Wardhana (2022) further explains that Indonesia's stock market offers various investment instruments, such as stocks, bonds, and mutual funds, whose performance is significantly influenced by macroeconomic factors.

A key index widely observed in Indonesia is the Jakarta Composite Index (JCI), which represents overall stock market activity. Investors rely on financial reports and

macroeconomic variables, such as inflation, interest rates, and exchange rates, to analyze and predict stock market movements. Previous studies by Hendayanti & Nurhidayati (2017) and (Khoirudin, 2024) indicate that both domestic and global factors, including currency fluctuations, inflation levels, interest rates, and foreign market performance, play a crucial role in influencing JCI movements.

Inflation affects consumer purchasing power and investment decisions. High inflation can erode investor returns and reduce investment activity in the stock market. Halim (2020) and Dwijayanti (2021) state that inflation, measured by the Consumer Price Index (CPI), serves as a key indicator of economic strength. However, previous research presents mixed findings on its impact on stock prices, with some studies identifying a negative correlation (Viska & Dewi, 2019), no correlation (Halim, 2020; Yunita & Robiyanto, 2018), or a positive correlation (Khoirudin, 2024; Verma & Bansal, 2021).

Interest rates also influence stock market performance. High interest rates encourage savings, reducing money circulation and discouraging investments in risky assets such as stocks, while low interest rates stimulate economic activity. Research by Asravor & Fonu (2021) and Verma & Bansal (2021) supports a positive relationship between interest rates and stock market performance, whereas Ananda & Santoso (2022) argue for a negative effect.

Additionally, exchange rates influence investment flows. A depreciating Rupiah may lead investors to shift toward foreign assets, decreasing demand for domestic stocks Permaysinta & Sawitri (2021). Studies on exchange rate effects have produced varying results, with Murti (2017) and (Juliodinata, Tiro, & Ahmar, 2019) identifying a positive correlation, Handayani & Oktavia (2018) finding no significant impact, and (Otorima & Kesuma, 2016) reporting a negative effect.

Given these inconsistencies in previous research, this study aims to examine the long-term impact of inflation, interest rates, and exchange rates on the Jakarta Composite Index (JCI) during the 2018-2024 period. The findings are expected to provide a more comprehensive understanding of the relationship between macroeconomic variables and Indonesia's stock market.

2. Research Method

This study employs a quantitative research approach utilizing the Vector Error Correction Model (VECM) to analyze the impact of macroeconomic variables on the Jakarta Composite Index (JCI). The research relies on secondary data from Bank Indonesia, the Indonesia Stock Exchange (IDX), and the Central Statistics Agency (BPS), covering the period from 2018 to 2024. The dataset includes inflation rates, interest rates, exchange rates, and JCI closing prices. Data is collected through official reports and financial bulletins to ensure reliability and accuracy.

The data analysis follows a structured methodology, beginning with stationarity testing using the Augmented Dickey-Fuller (ADF) test to confirm data suitability for time-series analysis (Ghozali, 2018). Next, the optimal lag selection is determined using the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC). The presence of long-term relationships among variables is examined using Johansen's cointegration test. If cointegration is found, the VECM model is applied to assess both short-term dynamics and long-term equilibrium adjustments.

Granger causality tests are conducted to examine causality among variables to deepen the analysis. At the same time, Impulse Response Function (IRF) and Variance Decomposition (VD) are used to analyze response patterns and the contribution of each variable to market fluctuations. The study aims to provide valuable insights into the interaction between macroeconomic factors and stock market behaviour, contributing to a broader understanding of financial market stability.

3. Results and Discussion

3.1 Stationary Test

The Augmented Dickey-Fuller (ADF) test is performed on the data both before and after differencing to evaluate its stationarity. The data is considered non-stationary if the absolute t-statistic is lower than the critical value from the MacKinnon table at significance levels of 1%, 5%, and 10%. Furthermore, if the p-value exceeds 0.05, the data is classified as non-stationary.

Table 1. Unit Root Test - ADF Level

Variable	t-Statistic	5% Critical Value	Prob	Note
LOGJCI	-1.399488	-2.896779	0.5788	Not Stationary
Inflation	-1.006397	-2.896779	0.7478	Not Stationary
Interest Rate	-1.336345	-2.897223	0.6092	Not Stationary
Exchange Rate	-1.794051	-2.897678	0.3810	Not Stationary

Based on the table above, the ADF level test indicates that all data are non-stationary. Therefore, the analysis proceeds with the ADF test at the first difference level.

Table 2. Unit Root Test - ADF 1st Difference

Variable	t-Statistic	5% Critical Value	Prob	Note
LOGJCI	-7.887051	-2.897223	0.0000	Stationary
Inflation	-7.814148	-2.897223	0.0000	Stationary
Interest Rate	-4.556259	-2.897223	0.0004	Stationary
Exchange Rate	-4.556259	-2.897678	0.0000	Stationary

Based on the table above, the ADF test at the first difference level indicates that all variables pass the stationarity test at the first difference level.

3.2 Optimal Lag Test

The optimal lag length for each criterion is used to determine the duration of the impact of one endogenous variable on another. In this test, the selection is based on the lag indicated by the Akaike Information Criterion (AIC).

Table 3. Optimal Lag Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	421.9170	NA	1.97e-10	-10.99782	-10.8715	-10.94879
1	459.6018	70.41110	1.11e-10	-11.56847	-10.95512*	-11.32334*
2	478.7254	33.71787	1.03e-10*	-11.65067*	-10.54664	-11.20944
3	488.1700	15.65811	1.23e-10	-11.47816	-9.883445	-10.84083
4	508.0015	30.79101	1.13e-10	-11.57899	-9.493593	-10.74556
5	521.3850	19.37091	1.25e-10	-11.51013	-8.934058	-10.48061
6	541.9856	27.64813*	1.16e-10	-11.63120	-8.564445	-10.40558
7	550.9911	11.13845	1.48e-10	-11.44713	-7.889700	-10.02541

From the table above, the AIC value suggests an optimal lag length of 2.

3.3 Model Stability Test

Table 4. Model Stability Test

Root	Modulus
0.744571	0.744751
0.062673 - 0.667316i	0.670253
0.062673 + 0.667316i	0.670253
0.477203	0.477203
-0.280038 - 0.288737i	0.361583
-0.280039 + 0.228737i	0.361583
0.319713	0.319713
-0.304673	0.304673

Based on the test results above, it can be concluded that the model used is stable. This is evidenced by the average modulus value being less than one.

3.4 Granger Causality Test

Table 5. Granger Causality Test

Null Hypothesis	Obs	F-Statistic	Prob
Inflation does not Granger Cause LOGJCI	82	1.95993	0.1478
LOGJCI does not Granger Cause Inflation		1.86971	0.1611
Interest Rate does not Granger Cause LOGJCI	82	0.27123	0.7632
LOGJCI does not Granger Cause Interest Rate		1.8069	0.1710
Exchange Rate does not Granger Cause LOGJCI	82	3.89879	0.0244
LOGJCI does not Granger Cause Exchange Rate		8.30909	0.0005
Interest Rate does not Granger Cause Inflation	82	3.79425	0.0268
Inflation does not Granger Cause Interest Rate		3.81784	0.0262
Exchange Rate does not Granger Cause Inflation	82	1.80897	0.1707
Inflation does not Granger Cause Exchange Rate		0.41797	0.6599
Exchange Rate does not Granger Cause Interest Rate	82	1.60113	0.2083
Interest Rate does not Granger Cause Exchange Rate		0.70504	0.4972

Based on the Granger causality test, variables with a probability value of less than 0.05 exhibit a causal relationship with JCI. The test results indicate the following:

3.4.1 The inflation variable does not have a statistically significant effect on JCI, as its probability value of 0.1478 is greater than 0.0500.

3.4.2 The interest rate variable does not have a statistically significant effect on JCI, as its probability value of 0.7632 is greater than 0.0500.

3.4.3 The exchange rate variable has a statistically significant effect on JCI, as its probability value of 0.0244 is less than the 0.0500.

3.5 Cointegration Test

Table 6. Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5% Critical Value	Prob
None *	0.409565	91.26331	47.85613	0.0000
At most 1 *	0.320273	49.11165	29.79707	0.0001

At most 2 *	0.121577	18.22655	15.49471	0.0189
At most 3 *	0.093537	7.856387	3.81465	0.0051

The cointegration test results indicate the presence of four cointegrating relationships based on the trace statistic at a 5% significance level. This suggests that the movements of the JCI, inflation, interest rate, and exchange rate exhibit long-term equilibrium and stability.

3.6 Vector Error Correction Model (VECM)

Table 7. VECM Estimate (Long Term)

Variable	Coefficient	t- Statistic	t-Table	Note
Inflation	-0.200327	-0.043246	1.9897	Not Sig.
Interest Rate	-0.539736	-2.11067	1.9897	Not Sig.
Exchange Rate	23.98352	7.40542	1.9897	Sig.

The presentation of the VECM model can be observed in the table above. In the long term, only the exchange rate variable has a significant impact on the JCI variable, as indicated by its t-statistic value of 7.40542, which exceeds the absolute critical value of 1.9897. In contrast, the inflation and interest rate variables do not exhibit a significant effect on the JCI.

3.7 Impulse Response Function

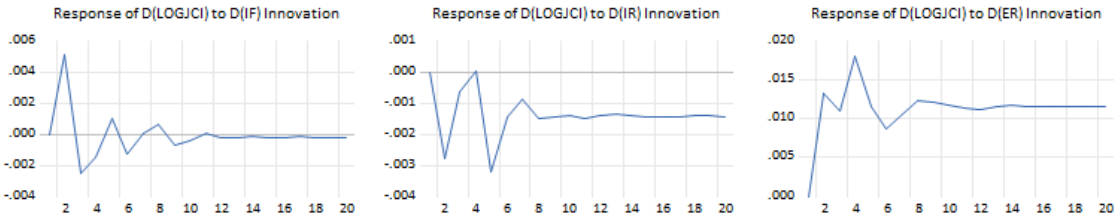

Figure 1. Impulse Response Variable of JCI

The response of JCI to shocks from the inflation variable over the period from the first to the twentieth month shows volatility between the first and tenth months. By the end of the observation period, the inflation demonstrates a negative impact because the response line remains below the equilibrium line. The response of JCI to shocks from the interest rate variable over the first to the twentieth month indicates that the interest rate demonstrates a negative impact because the response line consistently stays below the equilibrium line throughout the period. The response of JCI to shocks from the exchange rate variable over the first to the twentieth month demonstrates a positive impact on JCI throughout the observation period.

3.7 Variance Decomposition

Table 8. Variance Decomposition of D(LOGJCI)

Period	S.E.	D(LOGJCI)	D(Inflation)	D(Interest Rate)	D(Exchange Rate)
1	0.042424	100.0000	0.000000	0.000000	0.000000
2	0.047345	90.70201	1.152549	0.342080	7.803359
3	0.051506	87.29193	1.222817	0.304656	11.18060
4	0.056213	78.96726	1.091826	0.255770	19.68514
5	0.059286	76.93743	1.010779	0.521277	21.53052
6	0.062184	77.01808	0.960984	0.528469	21.49247
7	0.065686	76.81397	0.861343	0.491846	21.83284
8	0.068933	75.75572	0.790940	0.493408	22.95993
9	0.071727	74.72295	0.741660	0.495829	24.03956
10	0.074433	74.00616	0.691698	0.496514	24.80563
11	0.077093	73.57784	0.644817	0.501743	25.27560
12	0.079656	73.23723	0.605261	0.502103	25.65541
13	0.082173	72.87157	0.569360	0.499915	26.05915
14	0.084612	72.49200	0.537257	0.499897	26.47085
15	0.086953	72.15681	0.509658	0.500874	26.83266
16	0.089235	71.88278	0.484572	0.501396	27.13125
17	0.091472	71.64594	0.461543	0.501663	27.39085
18	0.093654	71.42493	0.440788	0.501756	27.63253
19	0.095786	71.21622	0.421864	0.501795	27.86012
20	0.097871	71.02328	0.404511	0.501979	28.07022

From the table above, the following explanations can be derived, for the effect of inflation on JCI, inflation influences JCI by 1.15% in the second month and continues to increase to 1.22% in the third month. Subsequently, the impact of inflation on JCI gradually decreased to 0.40% by the 20th month. For the effect of interest rates on JCI, interest rates affect JCI by 0.34% in the second month and continue to rise, reaching

0.53% in the sixth month. After that, the influence of interest rates gradually decreased to 0.50% by the 20th month. For the effect of the exchange rate on JCI, the exchange rate demonstrates a more significant contribution compared to inflation and interest rates. The exchange rate variable influences JCI by 7.80% in the second month and continues to increase, reaching 28.07% by the 20th month.

4. Conclusion

The findings of this study highlight the long-term impact of inflation, interest rates, and exchange rates on the Jakarta Composite Index (JCI) from 2018 to 2024. The analysis indicates that inflation and interest rates do not significantly negatively affect JCI in the long run, suggesting that stock market movements may be influenced by other macroeconomic factors or investor expectations rather than these two variables alone. Conversely, the exchange rate exhibits a significant positive relationship with JCI over the study period, implying that currency fluctuations play a crucial role in shaping market trends. These results provide valuable insights for investors and policymakers in understanding the stock market dynamics and designing strategies that account for the varying influences of macroeconomic indicators. Future research could explore additional variables or extend the analysis to different economic conditions to refine these findings.

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