

The Influence of Macroeconomic Factors and Global Commodity Prices on the Jakarta Islamic Index (JII) in Indonesia with the VECM Approach

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Abstract

Keywords:

Jakarta Islamic Index, Macroeconomics, Gold Price, World Oil Price, VECM.

This study analyzes the influence of macroeconomic factors and global commodity prices on the prices of sharia stocks that are members of the Jakarta Islamic Index (JII) in Indonesia, using monthly data for the period January 2011-December 2024 as many as 168 observations. The variables used include inflation, BI Rate, rupiah exchange rate, money supply (M2), world gold price, and world oil price. Data was obtained from BPS, Bank Indonesia, Indonesia Stock Exchange, World Gold Council, and U.S. Energy Information Administration (EIA). The Vector Error Correction Model (VECM) method is used to identify short-term and long-term influences. The results show that in the long term, gold prices and world oil prices have a significant positive effect on JII, while the rupiah exchange rate and the money supply have a significant negative effect. Inflation and the BI Rate do not have a significant influence. In the short term, the ECT value of -0.038970 indicates an adjustment towards a long-term equilibrium of 3.9% per period. The novelty of this research lies in the use of a longer data range until 2024 and the simultaneous integration of domestic macro and global commodity variables in the VECM model, thus providing a more comprehensive picture of the behavior of the sharia stock market after the pandemic. Practically, these findings are important for investors and policymakers to understand JII's sensitivity to global factors, especially world gold and oil price movements, in order to optimize investment strategies and stability of the Islamic capital market.

INTRODUCTION

Indonesia's sharia capital market is one of the important instruments in supporting economic growth based on Islamic principles. Since the introduction of the Jakarta Islamic Index (JII) in 2000, this index has served as the main barometer of the performance of Islamic stocks. The increasing number of investors and the market capitalization of sharia show that there is trust in financial instruments that are ethical, fair, and free of usury. Nevertheless, the movement of JII is inseparable from the influence of domestic macroeconomic variables and global commodities. The Jakarta Islamic Index (JII) aims to be a benchmark in evaluating investment performance in

sharia-based stocks, with the hope of increasing investors' confidence in developing sharia-based equity investments (Setiawan & Nurzaman, 2021).



Source: Financial Services Authority (OJK)

Figure 1.1 shows that the value of the Jakarta Islamic Index (JII) has fluctuated significantly during the period 2011–2024. The index continued to increase from around 480 points in 2011 to a peak of 759 points in 2017. However, there was a sharp decline in 2020 due to the impact of the COVID-19 pandemic, which suppressed economic activity and the stock market. After that, JII showed a sustained recovery trend to reach around 800 points in 2024, reflecting the re-increase in investor confidence in Indonesia's sharia capital market.

Various studies show that the price of sharia stocks is influenced by inflation, policy interest rates (BI Rate), rupiah exchange rates, money supply (M2), and world gold and oil prices (Mishkin, 2016). However, the results of previous research still show inconsistencies. For example, some studies have found that inflation and exchange rates negatively impact the JII (Rusbariand et al., 2012), while other studies have shown a less significant effect. Some studies have also found that world gold and oil prices have a positive effect, while others find different directions of influence (Rahmiyanti & Fianto, 2019). The inconsistency of these findings shows that there is a research gap that needs to be explained more comprehensively.

In addition, most previous studies have used traditional linear regression approaches, such as Ordinary Least Squares (OLS) or multiple regressions, which are only able to capture short-term relationships and have not taken into account the long-term dynamics between variables. The model has the potential to produce biased conclusions when the data is non-stationary and

integrated. This study fills the gap by using the Vector Error Correction Model (VECM), which is able to analyze both short-term and long-term relationships simultaneously, thus providing a more accurate picture of JII's sensitivity to domestic and global factors.

The novelty of this study lies in the use of a longer and more recent range of data until 2024, the simultaneous integration of domestic macro and global commodity variables within the framework of the VECM, as well as an analysis that highlights the behavior of the Islamic stock market post-pandemic and in the period of normalization of global monetary policy. With this approach, the research provides a new understanding of the factors that significantly affect JII in the short and long term.

Academically, this research contributes to strengthening the literature on the Islamic capital market with a more up-to-date methodological approach. In practical terms, the results of the research are expected to assist investors, regulators, and policymakers in making strategic decisions that take into account the dynamics of macroeconomic variables and global commodity movements on the stability of JII.

METHODS

This study uses a quantitative approach with a time series analysis method to identify the short-term and long-term relationship between macroeconomic variables and sharia stock prices represented by the Jakarta Islamic Index (JII). The method used is the Vector Error Correction Model (VECM), because this model is able to capture short-term dynamics while presenting long-term relationships when the research variables are not stationary at the level but are integrated. The selection of the VECM method was also based on the results of the unit root test and the Johansen cointegration test which showed that the research variables had a long-term equilibrium relationship.

The research period used was January 2011 to December 2024 with a total of 168 monthly observations. The selection of this period is based on several methodological considerations, namely the availability of complete and consistent data since 2011 for all macro variables used. In addition, the period includes various important economic phases such as the 2013 taper tantrum crisis, the 2018 exchange rate turmoil, the COVID-19 pandemic in 2020–2021, as well as the recovery and normalization period of global monetary policy until 2024. This long time span and covering various economic cycles is considered important to provide an accurate and representative picture of the relationship between macroeconomic variables and JII. In addition, the structure of the JII has been more stable after 2011 so that the selection of this period provides more reliable results.

The data used is secondary data obtained from various official sources, such as Bank Indonesia (BI) for inflation data, BI Rate, Rupiah against USD exchange rate, and money supply (M2). JII data was obtained from IDX and Yahoo Finance, while world gold price data was taken from the World Gold Council and Investing.com. Meanwhile, world oil price data (crude oil) was obtained from the U.S. Energy Information Administration (EIA). All data is collected in the form of monthly data to maintain consistency and conformity with the VECM method.

The variables used in this study consist of one dependent variable, namely the JII stock price, as well as six independent variables: inflation (X_1), BI Rate (X_2), Rupiah exchange rate against USD (X_3), M2 money supply (X_4), world gold price (X_5), and world oil price (X_6). All variables were analyzed using the VECM procedure which included stationary testing using Augmented Dickey-Fuller (ADF), determination of optimal lag through Akaike Information Criterion (AIC), Johansen cointegration test, VECM model estimation, and advanced analysis in the form of Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) to see the response and relative contribution of each variable.

Data processing is carried out with the help of EViews 12 software, as this software has advantages in time series data analysis, especially for VECM models. EViews 12 provides comprehensive and accurate features for stationarity, cointegration, IRF, and FEVD tests, and is widely used in international economic and financial research, thereby increasing the validity and credibility of research results.

RESULTS AND DISCUSSION

Descriptive Statistical Analysis

Table 1. Stationary Data

Variabel	Augmented Dickey -Fuller		Phillips-Perron	
	Level	1 st Difference	Level	1 st Difference
Y (Stock Price)	0.1604	0.0000*	0.1604	0.0000*
X1 (Inflation)	0.1548	0.0000*	0.2345	0.0000*
X2 (Bi Rate)	0.4347	0.0000*	0.4640	0.0000*
X3 (Exchange Rate)	0.2591	0.0065*	0.2628	0.0022*
X4(Money Supply)	0.2129	0.0461*	0.0070*	
X5(Gold Price)	0.9524	0.0000*	0.9787	0.0000*
X6 (World Oil Prices)	0.2378	0.0000*	0.2854	0.0000*

Description : Sign * Declaring Stationary

Interpretation of the Dickey-Fuller Augmented Test:

All variables have a probability value greater than 0.05 at the level, so they are not stationary at the level. However, after the first differentiation was carried out, all variables showed a probability value of < 0.05 , so that they became stationary at the first difference level (I(1)). Thus, all variables in this study are I(1) based on the ADF test.

Interpretation of the Phillips-Perron test:

The results of the PP test showed the same pattern as the ADF test, where almost all variables became stationary after the first differentiation was carried out. Only the Money Supply variable (X4) is stationary at the level ($p\text{-value } 0.0070 < 0.05$), but for the sake of consistency of analysis, it can still be considered $I(1)$ if all other variables are stationary at the first level of differentiation.

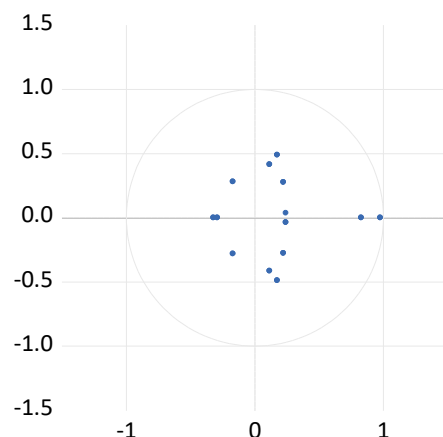
Table 2. Optimal Team

Was	LogL	LR	FPE	AIC	SC	HQ
0	2672.571	ON	6.47e-24	-33.52919	-33.39408	-33.47432
1	3258.854	1113.570	7.52E-27	-40.28748	-39.20660*	-39.84855
2	3374.650	209.7427	3.26e-27*	-41.12767*	-39.10104	-40.30468*
3	3398.514	41.12402	4.51E-27	-40.81149	-37.83910	-39.60443
4	3437.500	63.75189	5.20e-27	-40.68554	-36.76738	-39.09442
5	3468.035	47.24133	6.73e-27	-40.45326	-35.58934	-38.47808
6	3496.521	41.56574	9.08E-27	-40.19524	-34.38555	-37.83599
7	3519.108	30.96714	1.34e-26	-39.86299	-33.10754	-37.11967
8	3578.714	76.47614*	1.27e-26	-39.99640	-32.29519	-36.86902

The results of the optimal lag length selection test (VAR Lag Order Selection Criteria) showed that the FPE, AIC, and HQ criteria chose lag 2 as the best, while SC chose lag 1 and LR chose lag 8. Since most of the criteria show lag 2, this study used lag 2 as the optimal lag. This means that each variable in the model is influenced by its own value and the other variables up to the previous two periods. The selection of lag 2 is considered the most appropriate because it can more accurately describe the dynamic relationships between variables without making the model too complex.

Stability Testing

After getting the optimal lag, the next step is to test the stability of VAR on the lag. VAR value stability testing using VAR stability condition check. This test is done by calculating all the roots of the polynomial function. Then, the VAR value will be stable if all roots have a modulus smaller than one (<1) and are located in a unit circle. If the VAR value is stable, then the Impulse Response Function (IRF) and the Forecast Error Variance Decomposition (FEVD) generated will be valid

Table 3. VAR Stability**Inverse Roots of AR Characteristic Polynomial**

Root	Modulus
0.976697	0.976697
0.828764	0.828764
0.174544 - 0.488781i	0.519011
0.174544 + 0.488781i	0.519011
0.115123 - 0.415074i	0.430743
0.115123 + 0.415074i	0.430743
0.223028 - 0.275958i	0.354816
0.223028 + 0.275958i	0.354816
-0.170217 - 0.280228i	0.327875
-0.170217 + 0.280228i	0.327875
-0.321589	0.321589
-0.291449	0.291449
0.241423 - 0.035741i	0.244054
0.241423 + 0.035741i	0.244054

The results of the VAR model stability test show that all characteristic root values (roots) have a modulus smaller than one ($|\text{root}| < 1$). This means that there are no roots outside the circle unit. Thus, the VAR model is declared stable and meets the stationary conditions of the system. This stability suggests that the relationships between variables in the model—i.e. changes in sharia stock prices, inflation, interest rates, gold prices, world oil prices, money supply, and exchange rates—are dynamic yet controlled, making the model feasible for further analysis such as Granger causality tests, impulse response function (IRF), and variance decomposition (FEVD).

Cointegration TestingI

The cointegration test aims to determine whether non-stationary variables are cointegrated or not. The concept of cointegration is a linear combination of two or more directions when initially a non-stationary data becomes a stationary data (Engel and Granger, 1987). This cointegration can be interpreted as a long-term equilibrium relationship between each variable. The test uses the Johansen Cointegration Test (Johansen Cointegration Test). The test hypothesis is H_0 = not cointegrated and H_1 = cointegrated with the basis for drawing conclusions from this test, if the trace statistic value is greater than the critical value (trace statistic > critical value) then the equation has cointegration. Therefore, if there is enough evidence to reject the null hypothesis (H_0), the next stage of analysis is the Vector Error Correction Model (VECM) analysis.

Table 4. Cointegration

Hypothesized No. of CE(s)	Self-esteem	Trace Statistic	Critical Value (0.05)	Prob.**
None *	0.402749	358.2242	125.6154	0.0000
At most 1 *	0.386796	273.6956	95.75366	0.0000
At most 2 *	0.332945	193.4901	69.81889	0.0000
At most 3 *	0.273993	127.0892	47.85613	0.0000
At most 4 *	0.197724	74.57706	29.79707	0.0000
At most 5 *	0.183562	38.44792	15.49471	0.0000
At most 6 *	0.031139	5.188023	3.841465	0.0227

Remarks:(*) show a significant effect at the level of 5%.

Negative and significant ECT (-0.038970) showed an adjustment mechanism towards long-term equilibrium of 3.9% per period.

Interpretation Per Variable on JII Stock Price

1. Inflation

The results of the estimation show that inflation has a negative insignificant coefficient in the short term of 0.000860 ($t = 0.59815$) and a negative coefficient insignificant in the long term of -0.485394 ($t = -0.04569$). This means that changes in inflation both in the short and long term do not significantly affect JII's share price.

Theoretically, these results do not contradict *Monetary Transmission Framework* (Mishkin, 2016), where stable inflation does not always put pressure on the stock market when there is an adjustment in market participants' expectations. These results are also in line with Rahmiyanti and Fianto, (2019) which found that inflation had no significant effect on the sharia stock index.

Implications: Islamic investors do not place inflation as the main indicator in investment decisions, so the price stabilization policy by Bank Indonesia only has an indirect impact on JII.

2. BI Rate

The BI Rate has a short-term insignificant negative coefficient of $-4.90E-05$ ($t = -0.09127$) and a long-term insignificant positive coefficient of 14.40865 ($t = 0.54087$). This means that changes in the policy interest rate do not affect JII's share price.

These results support the theory that the sharia market is not interest-based, so changes in the BI Rate are not necessarily responded to by sharia investors. These findings are consistent with (Mishkin, 2016) that the transmission of interest works only on conventional instruments, and is reinforced by Saraswati, (2024) which found that the BI Rate was not significant to ISSI.

Implications: Interest rate-based monetary policy is not the main reference for Islamic investors. Policymakers need to develop sharia instruments so that monetary transmission is more effective in the sharia market.

3. Exchange Rate (SWAP)

The exchange rate showed a negative coefficient that was not significant in the short term of -0.000915 ($t = -0.99525$), but a negative significance in the long term of -0.760995 ($t = -3.46969$). This means that the depreciation of the rupiah significantly lowers JII's share price in the long run.

In theory, these results support *Purchasing Power Parity* which states that the weakening of the exchange rate increases import costs and suppresses the company's profitability. These results are also in line with Rahmiyanti & Fianto, (2019) which found the negative influence of the exchange rate on JII.

Implications: Islamic investors need to pay attention to exchange rate stability as it has a strong long-term impact. The government needs to maintain rupiah stability to protect the Islamic capital market.

4. Money Supply (M2)

M2 has a significant positive coefficient in the short term of 0.024096 ($t = 7.31559$) and a significant negative coefficient in the long term of -45.45064 ($t = -7.59795$).

This means that in the short term, increased liquidity increases investment activity, thereby boosting JII. In the long run, excess liquidity creates inflationary pressures, thereby reducing the attractiveness of the stock market.

In theory, this corresponds to *Liquidity Effect* short-term and *Inflationary Pressure* long-term (Mishkin, 2016). These results are also consistent with Salisu & Ogbonna, (2020) that the excess M2 has a negative impact on the stock market in the long term.

Implications: Bank Indonesia needs to maintain balanced M2 growth so as not to cause inflationary pressures that could disrupt the Islamic capital market in the long term.

5. World Gold Price

Gold prices show a significant negative coefficient in the short term of -0.042195 ($t = -5.02267$) and a significant positive in the long term of 6.128408 ($t = 3.79822$).

Interpretasi:

- In the short term, gold acts as a safe haven, so when investors move to gold, the JII tends to fall.
- In the long term, the rise in gold prices reflects stable global economic conditions, thus supporting the rise of the Islamic stock market.

These results support the literature *safe haven* like Shahzad et al. (2019) and portfolio diversification theory *Modern Portfolio Theory*.

Implications: Islamic investors need to monitor gold prices as an indicator of short-term global risks and long-term diversification opportunities.

6. World Oil Prices

World oil prices have a significant negative coefficient in the short term of -0.082536 ($t = -3.34653$) and a significant positive coefficient in the long term of 1.489228 ($t = 2.84076$).

Interpretasi:

- In the short term, the increase in oil prices increases production costs, thus depressing the company's performance and lowering the JII.
- In the long term, the increase in oil prices reflects global economic growth, thus having a positive impact on the Islamic capital market.

These results are consistent with Adekoya et al. (2021) which confirms that oil has different impacts on different time horizons.

Implications: World oil prices can be used as an important indicator by Islamic investors to gauge global risks and formulate long-term portfolio strategies.

7. ECT (Error Correction Term)

ECT was valued at -0.038970 ($t = -3.16079$) and was significant, indicating that the system made adjustments towards a long-term equilibrium of 3.9% per month.

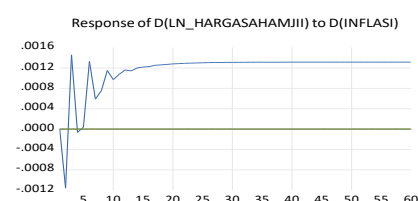
Implications:

The Islamic stock market has a strong stability mechanism, and short-term shocks can be absorbed gradually towards a long-term equilibrium.

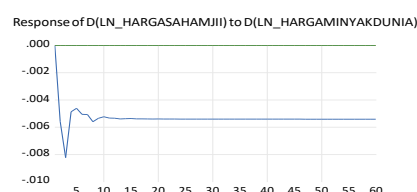
Impulse Response Function (IRF)

The Impulse Response Function (IRF) analysis is used to determine how the Sharia stock price variable (JII) responds to shocks originating from macroeconomic variables and global commodities in the next few periods. Based on the results of the IRF estimate in the figure above, the JII response to each variable can be explained as follows:

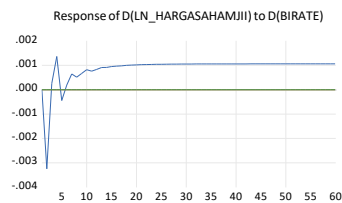
Response to Cholesky One S.D. (d.f. adjusted) Innovations



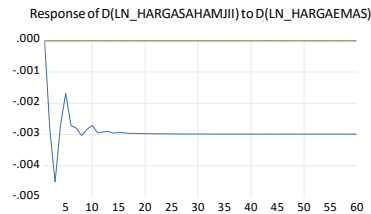
Response to Cholesky One S.D. (d.f. adjusted) Innovations



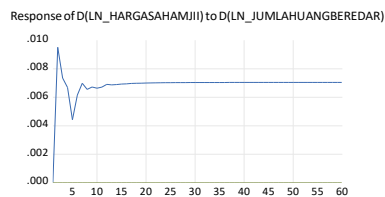
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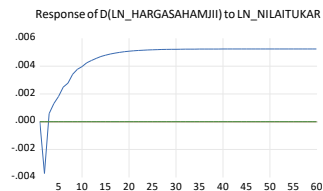
Response to Cholesky One S.D. (d.f. adjusted) Innovations



Response to Cholesky One S.D. (d.f. adjusted) Innovations



Response to Cholesky One S.D. (d.f. adjusted) Innovations



1. JII's Stock Price Response to Inflation

The inflation-induced shocks gave a negative response at the beginning of the period to JII's stock price movements, but the effect turned positive and stable after the 10th period. This shows that the increase in inflation initially suppressed the price of sharia stocks because it reduced people's purchasing power and the profitability of issuers. However, in the medium to long term, the market is able to adjust to inflationary conditions, so that the impact on JII becomes neutral. These findings are consistent with the theory of monetary transmission which states that the effect of inflation on the capital market is temporary and decreases over time.

2. JII's Stock Price Response to BI Rate

JII's share price response to the BI Rate shock showed a sharp decline at the beginning of the period, but it slowly increased and stabilized near zero after the 15th period. This means that the increase in policy interest rates poses negative pressure on the Islamic stock market because it increases opportunity costs for investors and diverts investment to low-risk instruments. However, this effect is only temporary because the Islamic market is not interest-based, so adjustments take place faster than conventional markets.

3. JII's Stock Price Response to the Rupiah Exchange Rate

The shock in the rupiah exchange rate showed a positive response that increased sharply until the 10th period before finally stabilizing. This means that in the short term, the appreciation of the rupiah against the US dollar provides a positive signal for the Islamic stock market because it strengthens purchasing power and reduces import costs for issuers. However, after the intermediate period, the influence began to decline because the exchange rate factor tended to be anticipated by market participants.

4. JII Stock Response to Money Supply (M2)

The shock in the money supply caused a significant positive response to the JII from the beginning of the period until around the 15th period. This shows that increased liquidity in the community encourages investment activities in the Islamic capital market. However, after the 20th period, the response began to stabilize, signaling that the market had reached a new balance.

between demand and supply of stocks. Thus, a moderate increase in the money supply has an expansive impact on the growth of the sharia stock market.

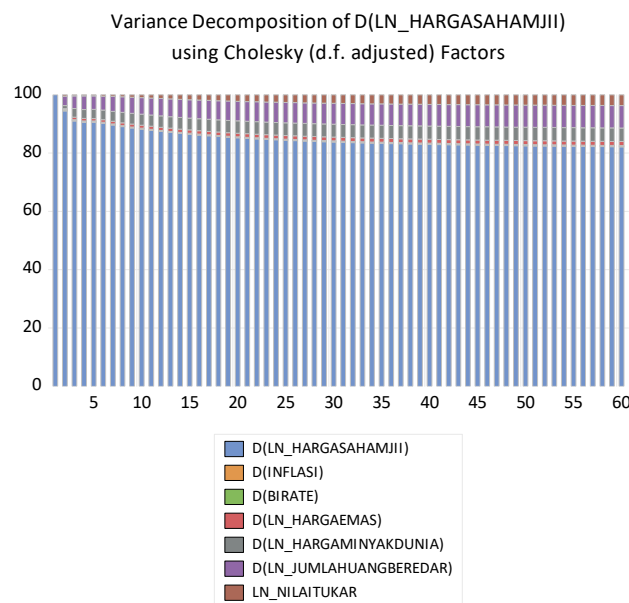
5. JII's Stock Price's Response to World Gold Prices

JII's response to world oil price shocks showed a sharp negative reaction at the beginning of the period (around the 1st to 5th period), then gradually stabilized after the 20th period. This means that the sudden increase in oil prices increases energy and production costs which suppresses the company's profits, thus negatively impacting the Islamic stock index. However, the effect is temporary as markets adjust to changes in global energy prices over the long term.

Overall, the results of the Impulse Response Function show that JII's initial response to economic shocks is volatile and tends to be negative at the beginning of the period, especially for the BI Rate, oil prices, and gold prices. In the medium to long term, all responses show a stable pattern, indicating that the Islamic stock market in Indonesia has good adaptability to macroeconomic and global changes. The variables that have the strongest impact in the short term are gold prices and world oil prices, while in the long term the money supply (M2) is the most positive factor on the stability of the Islamic stock market

Analysis Forecast Error Variance Decomposition

This analysis is used to see how the change in a variable indicated by the change in error variance is affected by other variables. This analysis characterizes a dynamic structure in the VAR/VECM model and can see the strengths and weaknesses of the. Each variable affects the other over a long period of time. This analysis details the range of error forecasting into component components that can be linked to each endogenous variable in the model. By calculating the percentage of the square of the prediction error k- the next stage of a variable due to innovation in other variables, it can be seen how big the difference between the error variance before and after the occurrence of the movement that originates from itself and that of other variables so that it can be known exactly what factors affect the fluctuations of certain variables.



Based on the results of the Variance Decomposition on the sharia stock price variable (JII), it can be seen that most of the variations or fluctuations in the price of JII shares are explained by

itself, as shown by the dominance of the blue bars on the chart. This shows that the movement of sharia stock prices in Indonesia is more influenced by internal factors of the stock market, such as investor behavior and the dynamics of sharia issuers, than by external macroeconomic factors. Meanwhile, the contribution of other variables such as inflation, interest rates (BI Rate), gold prices, world oil prices, money supply, and exchange rates to changes in JII's stock price is relatively small and increases very slowly over time. A stable pattern from the beginning to the end of the period suggests that the influence structure between variables has not changed much in the long term. Thus, it can be concluded that sharia stock prices (JII) tend to have more independent characteristics and are less sensitive to fluctuations in macroeconomic variables, although global commodity factors such as gold and world oil are starting to have a small influence on their movements

CONCLUSION

This study aims to analyze the influence of macroeconomic variables and global commodity prices on the stock price of the Jakarta Islamic Index (JII) using the Vector Error Correction Model (VECM) method with 168 monthly observations for the period 2011–2024. Based on the estimated results, it was found that inflation and the BI Rate did not have a significant influence in both the short and long term. In contrast, the rupiah exchange rate, money supply (M2), world gold prices, and world oil prices show significant influences, with different directions between the short and long term. These results confirm the dynamics of macroeconomic and global commodity interactions on the movement of sharia stock indices in Indonesia.

The contribution of this research lies in the use of VECM as an approach capable of capturing long-term relationships that have not been studied in depth in previous studies. In addition, this study provides the latest empirical evidence regarding the sensitivity of the Islamic capital market to global factors such as gold and oil, while confirming that the transmission of conventional monetary policy (BI Rate) does not directly affect the Islamic market. Thus, this study enriches the literature related to the dynamics of Islamic capital markets in developing countries and strengthens the understanding of the role of macro variables in the framework of Islamic financial stability.

This research has several limitations. First, the variables used are limited to six global macro and commodity indicators so that they do not include other external factors such as sharia-based global indices, geopolitical sentiment, or world market volatility. Second, the study uses monthly data so that it does not capture very short-term fluctuations (high-frequency) that may affect the movement of the daily index. Third, the model used did not test for the effects of moderation or non-linearity that might be relevant under certain market conditions.

Based on these limitations, further research is recommended to add global variables such as the Dow Jones Islamic Market Index, oil price volatility (OVX), and global economic uncertainty indicators (GEPV). The use of more complex methods such as structural VAR, nonlinear ARDL (NARDL), or machine learning approaches can also provide a deeper understanding of the dynamics of the Islamic capital market. In addition, follow-up studies can expand the scope of analysis on specific sectors in the sharia index to identify different sensitivities between industries.

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