

MACROECONOMIC VARIABLES AND JAKARTA ISLAMIC INDEX (JII) IN INDONESIA: AN APPROACH OF ERROR CORRECTION MODEL

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Abstract: The purpose of this study aims the impact of macroeconomic variables on the Jakarta Islamic Index (JII) over the period 2012-2021. Macroeconomic variables include inflation, the exchange rate, the bi-rate, global oil prices, and the price of gold. In this study, the Error Correction Model (ECM) was used to examine the short- and long-macroeconomic variables' short- and long-term impact mic Index (JII). According to the findings, the Indonesian sharia exchange rate and Bi-Rate had an impact on the sharia stock index in the short run. In contrast, interest rates, global oil prices, and global gold prices have a long-term impact on the sharia stock index. Variable inflation has no effect on either.

Keywords: *Macroeconomic Variables; Sharia Stock Index; Sharia Shares, Error Correction Model. Jakarta Islamic Index (JII).*

Introduction

The Stock Exchange Market plays an essential role in the country's economy, transferring investment funds from stock investors to stock borrowers necessary for a healthy economy. The stock exchange market is simply the market where securities (stocks, bonds, etc.) are traded. The stock market plays a significant role in financial intermediation in developed and developing countries (Ologunde, 2006).

Silber and Kenneth (2009) investigated a stock exchange that allows stock brokers and dealers to buy and sell financial securities such as stocks and bonds. It also makes it easier to redeem securities, financial instruments, and other issues; securities that are traded on a stock exchange are issued by companies (unit trusts, bonds and derivatives).

The stock market experiences an increase (bullish) or a decrease (bearish) will experience price fluctuations that are recorded through index movements. Investment growth in a country will be influenced by the country's economic growth. The better the level of the economy of a country, it is generally characterized by an increase in the level of people's income. With the increase in income, more people will have excess funds, these funds can be used to be stored in savings or invested in additional securities in the capital market.

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The capital market's significant functions in carrying out its tasks are economical and financial. The capital market promotes the meeting of two interests in the economic sector: those who require funds (issuers) and those who have excess funds (holders) (investors). Investors with extra funds might invest them in the capital market in the hopes of making a profit, while issuers (businesses) who receive cash from investors can use the funds for their operational needs.

While from the financial sector, the capital market provides an opportunity for investors to benefit from the funds that have been invested in a company that has been selected according to investor analysis. The capital market is expected to be able to increase Indonesia's economic activities because alternative long-term funding for companies to increase economic activity is the capital market, increase in company profits and the welfare of the wider community can be met if the company can operate on a larger scale. An essential factor that must exist in Indonesia is the existence of a capital market for the benefit of national economic development; this is evidenced by the number of companies and industries that use the capital market as an instrument to obtain investment funds as capital to strengthen the company's financial position.

The Qur'an is applied as a Sharia principle in the capital market. In addition to the Qur'an, the highest source of law used to the hadith of the Prophet Muhammad SAW. Both sources and scholars carry out interpretations, and the results of these interpretations are called the science of fiqh. In fiqh, there are many discussions, one of which is muamalah, where muamalah is the relationship between humans and humans regarding commercial activities. This is the basis for developing a sharia capital market based on muamalah fiqh.

The existence of fiqh rules conveys that all muamalah activities may be carried out unless a proposition prohibits it. this concept is the principle of the Islamic capital market. One of the growing Islamic finance industry sectors is the Islamic capital market. In Indonesia, the history of this industry began with the issuance of sharia mutual funds by PT Danareksa Investment Management on July 3, 1997. After that on July 3, 2000, the Jakarta Islamic Index (JII) is published. Currently, the Indonesian economy has overgrown the development of Islamic economics in Indonesia. Both among practitioners and academics. The Islamic finance industry can also develop if the Islamic capital market develops.

The Jakarta Islamic Index (JII) is an average stock index consisting of 30 sharia companies with liquidity and a very large market capitalization. Meanwhile, the incorporated companies have met the sharia-based investment criteria starting from fund management, investment and company operations. Every 6 months, IDX conducts a JII review which is adjusted to the period of issuance of DES by Bapepam & LK. For example, JII movement also experienced a decline, although not as severe as IHSG; Judging from its performance in early 2021, the Sharia Index on the IDX had touched the green zone several times at the end of 2020 and early 2021.

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The development of Islamic stocks is inseparable from macroeconomic factors that must be considered, including inflation, exchange rates, world oil price rates and gold prices, because it is an important factor that can affect the economy of a country. Indonesia's inflation rate has continued to decline in recent years. The peak will be in 2020, where people's purchasing power and production of goods decline due to people starting to secure their money and only buy what is really needed. An increase in interest rates has a bad impact on the capital market because the possibility of investors to sell their shares is higher if there is an increase in interest rates (Ghassani & Sukmana, 2020).

According to Retnasih (2019) domestic macroeconomic performance can cause capital market shocks and effect price drops or gains. Meanwhile, Wijayanti (2013) discovered that macroeconomic variables have no impact on capital market prices in their study. This is in line with the findings of and Sri Herianingrum (2020) who found that exchange rate and inflation variables had little effect on stock index prices. Stock macroeconomic variables have no substantial effect on stock market returns, according to Analyst & Trust (2013) In Nigeria, interest rates were shown to be adversely and insignificantly correlated with stock market performance.

Inflation is a condition in which the cost of products and services continues to rise, and this increase is widespread Mishkin (2018). If inflation develops, the economy will experience two types of effects, both positive and bad. Inflationary fluctuations in the Indonesian capital market, particularly the Jakarta Islamic Index (JII), do not rule out the possibility of altering investment levels Suciningtias & Khoiroh (2015). According to Pasaribu, Rowland Bismark Fernando (2013) the Indonesian Sharia Stock Index shows a negative association with inflation. Bordo (2008) discovered that, in addition to its real influence on real asset prices, inflation has a significant negative impact on stock market conditions.

Meanwhile, Asmy et al (2010) discovered that inflation had a considerable impact on the Kuala Lumpur Composite Stock Price Index (KLCI). Similarly, Ifuero Osad Osamwonyi and Esther Ikavbo Analyst & Trust (2013)(Analyst & Trust, 2013) found that macroeconomic factors, such as inflation, have a favorable impact on the Nigerian stock market index. Similarly, Ozbay (2009) findings show that inflation has a favorable impact on stock returns in Turkey. The price of one currency in terms of another is known as the exchange rate. The rupiah's depreciation versus international currencies had a detrimental impact on the economy and the capital markets. According to the findings of the investigation, a high exchange rate will cause the rupiah to weaken since it has a favorable and considerable effect on the JII stock index. Investors will resort to exchanging foreign money for rupiah and investing in stocks when the rupiah depreciates. As a result, the stock price will fluctuate, and the stock index will rise.



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Ilahi et al (2015) discovered that exchange rates and stock market returns have a short and long-term link. The short-term relationship was shown to be positive but not significant, whereas the long-term relationship was not significant. The exchange rate had a strongly favorable effect on the stock market performance of the three South Asian markets, according to Aurangzeb (2012). When Ologunde (2006) looked at currency rate volatility and stock market activity in Nigeria, they found similar results. The exchange rate has a considerable short- and long-term impact on the Nigerian stock market, The findings reveal that the exchange rate has a large beneficial effect on stock market performance in the short term, but that the link is notably negative in the long run. Ilahi et al (2015) discovered that exchange rates and stock market returns have a short and long-term link. The short-term relationship was shown to be positive but not significant, whereas the long-term relationship was not significant.

According to the findings of Pathan & Masih (2015) study, there is a significant association between the exchange rate of Islamic stocks on the FTSE Bursa Malaysia Hijrah Syariah. According to Ozbay (2009), the currency rate has a favorable impact on stock returns in Turkey. In contrast to earlier studies, Yahya Mohd Hussin (2012) found a negative relationship between the Malaysian Ringgit and the United States Dollar (MYR).

The influence of interest rates on stock market returns, according to research by Kuwornu & Victor (2011) is not significant and has a negative effect on the Ghanaian stock market. Interest rates had a strong negative link with stock prices in all situations, according to Alam & Uddin (2009) fluctuations in interest rates had a significant negative relationship with stock prices. According to Yahya Mohd Hussin (2012) the Islamic Inter Bank Rate (IIR) variable was adversely associated to stock prices in the Malaysia KLSI and had no significant influence (Kuala Lumpur Sharia Index).

According to Pasaribu, Rowland Bismark Fernando (2013) the BI interest rate variable has a favorable impact on the Indonesian Sharia Stock Index. According to the findings of this study, interest rates have a favorable link with Islamic stocks on the FTSE Bursa Malaysia Hijrah Syariah index. Similarly, Ozbay (2009)(Ozbay, 2009) study found that interest rate considerations have a beneficial impact on stock returns in Turkey. According to Ashraf et al. (2013), oil prices benefit from Islamic stock prices in India's Islamic stock market. According to Yahya Mohd Hussin (2012) Islamic stock values in the Malaysian FTSE show a positive link with oil prices, based on a long-term relationship analysis. According to Yahya Mohd Hussin (2012) Islamic stock prices in the FTSE exhibit a co-integration relationship with oil prices.

According to Sireesha (2013) research, gold prices have a beneficial impact on Indian stocks. According to the findings of Prastiani & Pamulang (2021), the gold price variable is positively associated to and has a considerable effect on the stock price of the Jakarta Islamic Index. According to Andiyasa (2014) the World Gold Price variable has an effect on the stock

market. Rustyaningsih (2018) and Tjandrasa & Sutjiati (2016) on the other hand, show that there is no effect on the World Gold Price variable.

The following are the research questions offered in this study based on the problem definition and background:

1. What is the level of inflation rates affect the Jakarta Islamic Index (JII) for the 2012-2021 period?
2. Does the exchange rate have an influence on the Jakarta Islamic Index (JII) for the 2012-2021 period?
3. Does BI-RATE have any influence on the Jakarta Islamic Index (JII) for the 2012-2021 period?
4. Does the World Gold Price have an influence on the Jakarta Islamic Index (JII) for the 2012-2021 period?
5. Does the effect of oil have an influence on the Jakarta Islamic Index (JII) for the 2012-2021 period?

The objective of this research summarized into two following goals:

1. Analyzing how the influence of inflation on the Jakarta Islamic Index (JII) for the 2012-2021 period.
2. Analyzing how the influence of the exchange rate on the Jakarta Islamic Index (JII) for the 2012-2021 period.
3. Analyzing how the influence of BI-RATE on the Jakarta Islamic Index (JII) for the 2012-2021 period.
4. Analyzing how the influence of the World Gold Price on the Jakarta Islamic Index (JII) for the 2012-2021 Period.
5. Analyzing how the influence of World Oil Prices on the Jakarta Islamic Index (JII) for the 2012-2021 Period.

Literature Review

Utami and Herlambang (2016) examined previous research on the influence of inflation on JII and concluded that inflation did not effect JII. Alghaniawati (2018) and Agestiani and Sutanto (2018) both found similar results (2019). Pantas (2017), Santosa and Wisnu (2018), Afendi (2017), and Hidayat (2017) all found that inflation had a considerable negative impact on JII. According to Firdausi, Fahmi, and Saptono (2016), inflation considerably benefits ISSI. The Effect of Macro Variables on Economics on the Stock Index in the Jakarta Islamic Index (JII) (2012-2016 Period) is a study (Afendi, 2017). The findings demonstrate that inflation has a negative impact on the Jakarta Islamic Index (JII), interest rates have a positive impact on the Jakarta Islamic Index (JII), and the exchange rate has a positive impact on Jakarta Islamic Index (JII) (JII). The Jakarta Islamic Index (JII) stock index is affected by all independent variables at the same time. "Analysis of the Effect of Macroeconomic Variables on the Jakarta Islamic



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Index (JII) for the Period 2007-2015," according to this study (Sukmana & Nisa, 2017). The Jakarta Islamic Index (JII) stock price index is unaffected by the foreign exchange rate or the production index. (MAJID, n.d.)

The study "The Effect" of Macroeconomic Variables on the Jakarta Islamic Index (JII) Period January 2010 to November 2015" (Utami & Herlambang, 2017) tries to assess if inflation, interest rates, and currency rates affect the Jakarta Islamic Index (JII). Interest rates have a positive effect on the Jakarta Islamic Index (JII), inflation has a negative effect on the Jakarta Islamic Index (JII), and the exchange rate has a positive effect on the Jakarta Islamic Index (JII), according to the findings of this study (JII). All independent variables influence the Jakarta Islamic Index simultaneously (JII). (Asmy et al., 2009) Analysis of the Effects of Macroeconomic Indicators on the Sharia Stock Price Index in Indonesia, Indonesia in 2011-2020, according to Wulan's research (2020). The goal of this research is to look at macroeconomic factors including inflation, the BI rate, the exchange rate, the money supply, the World Gold Price, the Deposit Interest Rate, the Sharia Deposit Yield, and the Industrial Production Index to the Sharia Stock Price Index. The analytical approach employed in this work is ECM (Error Correction Model). The study's findings reveal that the exchange rate and gold price have a negative impact on ISSI in the long run, but JUB has a beneficial impact. Only the exchange rate variable has a negative influence on ISSI in the short term. Meanwhile, the findings of the JII study suggest that long-term bank interest rates, exchange rates, and gold prices all have a negative impact on the index. Meanwhile, JII is influenced by the money supply and deposit interest rates. The interest rate of the Indonesian bank, the exchange rate, and the price of gold all have a negative impact on JII in the short term.

Rachmawati & Laila (2015), in their study "Macroeconomic Factors Affecting Stock Price Movements on the Indonesian Sharia Stock Index (ISSI) on the Indonesia Stock Exchange (IDX)." The findings revealed that inflation had a minor and negative impact on ISSI stock prices, SBI interest rates had a minor and positive impact on ISSI stock prices, and the exchange rate had a substantial impact on stock prices in Indonesia. The International Sharia Stock Index (ISSI) has a negative impact. PT Indonesia Syariah Stock Index stock price changes are influenced by the SBI interest rate, inflation rate, and exchange rate all at the same time (ISSI). "Analysis of the Effect of Inflation, Interest Rates, Rupiah Exchange Rates, and GDP on the Jakarta Islamic Index." It is known that inflation, interest rates, rupiah exchange rates, and gross domestic product all have an effect on JII, with inflation having a partially positive effect and interest rates and exchange rates having a negative effect, as determined by testing classical assumptions, hypotheses, and multiple linear regression analysis. The gross domestic product, on the other hand, has a positive impact on JII.

Rahmawati, (2016), in her research entitled "Analysis of the Effect of Exchange Rates, Inflation, and Interest Rates on the Stock Price Index (Case Study on the Jakarta Islamic Index

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Period 2010-2014)". The test results show that all variables simultaneously have a significant effect on the JII stock price index. While the partial test results show that the exchange rate and interest rates have a significant effect on the JII stock price index. The inflation variable itself has no significant effect on the JII stock price index. JII is projected to be affected by the currency rate. The price of a currency in relation to other currencies is known as the exchange rate. The exchange rate is a macroeconomic variable that has an impact on a country's economy. The price volatility of a stock is also affected by the exchange rate, which has an impact on JII. According to previous study, the exchange rate has a beneficial impact on JII (Santosa and Wisnu, 2018), Pantas, 2017, Afendi, 2017, Utami & Herlambang, 2016, and Alghaniawati (2018). The research of Firdausi, Fahmi, and Saptono (2016), which claims that the exchange rate has a negative influence on ISSI, and the research of Agestiani and Sutanto (2019), which states that the exchange rate has a negative effect on JII, provide different results.

The exchange rate has no significant effect on JII (Beik & Fatmawati, 2014), this research is supported by Ratnasari & Herianingrum (2019) which shows the exchange rate has no significant effect on ISSI. Ardana, (2016), in his research entitled "The Effect of Macroeconomic Variables on the Sharia Stock Index in Indonesia: ECM Model" Macroeconomic variables used are the rupiah exchange rate, Bank Indonesia Syariah Certificates (SBIS), interest rates (BI-rate), inflation and world oil prices. The research technique used is the error correction model (ECM), where the results show that the short-term correlation to the JCI price only occurs in the exchange rate and SBIS, while the long-term correlation that occurs in the Islamic stock index is interest rates, SBIS and oil prices. Najeeb & Masih (2016), in their research entitled "Macroeconomic Variables and Stock Returns: Evidence from Singapore". The results of his research show that stock market returns in Singapore are endogenous (follows). The macroeconomic variables used are interest rates, exchange rates and GDP. Of the three, GDP is identified as the most exogenous (leading). Meanwhile, the money supply and inflation have no effect.

Analysis of the Effects of Macroeconomic Indicators on the Sharia Stock Price Index in Indonesia, Indonesia in 2011-2020, according to Wulan's research (2020). The goal of this research is to look at macroeconomic factors such inflation, the BI rate, the exchange rate, the money supply, the World Gold Price, the Deposit Interest Rate, the Sharia Deposit Yield Industrial Production Index, and the Sharia Stock Price Index. The ECM method was used as the analytical methodology in this investigation (Error Correction Model). The study's findings reveal that the exchange rate and gold price have a negative impact on ISSI in the long run, but JUB has a beneficial impact. Only the exchange rate variable has a negative influence on ISSI in the short term. Meanwhile, the findings of the JII study suggest that long-term bank interest rates, exchange rates, and gold prices all have a negative impact on the index. Meanwhile, JII is influenced by the money supply and deposit interest rates.

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In the short term, the influencing variables are the Indonesian bank's interest rate, the exchange rate, and the price of gold, all of which have a negative impact on JII. Ardana, (2016), in his study titled "The Effect of Macroeconomic Variables on the Sharia Stock Index in Indonesia: ECM Model," found that "the effect of macroeconomic variables on the Sharia Stock Index in Indonesia: ECM Model The rupiah currency rate, Bank Indonesia Syariah Certificates (SBIS), Interest Rates (BI-rate), inflation, and world oil prices are the macroeconomic factors used. The error correction model was utilized as a research approach (ECM). The findings reveal that the exchange rate and SBIS have a short-term correlation with the price of the sharia stock index, while interest rates, SBIS, and world oil prices have a long-term correlation with the price of the sharia stock index. (Ilahi et al., 2015).

Research Method

This research is a quantitative research, Quantitative methods according to Sugiyono (2017), are research methods based on the positivist ideology, utilized for population study or specific samples, data collecting utilizing research equipment, quantitative or statistical data analysis, and hypothesis testing. The data is obtained from the official website of Bank Indonesia, the Sharia Stock Exchange, the Central Statistics Agency, and West Texas Intermediate (WTI). This research uses secondary data, data obtained and stored by other people which is usually past / historical data. Operational data used in the study used time series data using monthly data from January 2012 to December 2021. This data will be processed using the Eviews10 application to help obtain the results of macroeconomic effects on the JII stock index from the proposed hypothesis (Majid, n.d.)

Variable Operational Definition

The independent variable is a variable that affects or causes the change or the emergence of the dependent variable (bound).

Dependent Variable

The dependent variable is the one that is affected by the other variables (Nazaruddin & Basuki, 2016). According to Sekaran and Bouge (2010), the dependent variable is a variable that is the primary focus of research, with the researcher's primary purpose being to comprehend, describe, and explain the variability of this variable.

This study used the Jakarta Islamic Index as the dependent variable (JII). JII is a sharia stock index that debuted on the Indonesian stock exchange on July 3, 2000. The 30 most liquid sharia stocks listed on the IDX make up JII's constituents. The review of sharia shares, which are JII's constituents, is conducted twice a year, in May and November, by OJK's DES review schedule.

Independent Variable

Variables Independent variables are variables that do not affect other variables (Nazaruddin & Basuki, 2016). According to Sekaran & Bougie (2010), independent variables



help explain the variance in the dependent variable. The following are the independent variables in this study:

1. Inflation

Inflation raises the price of everything. Monthly data from January 2012 to December 2021 was gathered from the website www.bi.go.id and used in this study.

2. Exchange Rate

An exchange rate is a price at which two different currencies are exchanged. The calculation is based on a monthly comparison of the dollar to the rupiah exchange rate, which the government announces in rupiah per US dollar. The data was derived from monthly selling rates reported on Bank Indonesia's official website, www.bi.go.id, from January 2012 to December 2021. Units are expressed in US dollars (\$).

3. Bi-Rate (Interest Rate)

BI-RATE is the reference interest rate set by Bank Indonesia. For this study, the interest rate set by Bank Indonesia for January 2012 to December 2021 is used, which is recorded monthly on www.bi.go.id

4. Oil Price

West Texas Intermediate (WTI) is the world oil price. It is usually the center of international trading since WTI has excellent quality and low sulfur content, making it suitable for use as gas. Oil price variations can impact productivity, affecting the capital market. The average international crude oil price from January 2012 to December 2022 was used in this research.

5. Gold Price

Gold has various advantages; unlike copper, which is green, iron may rust and fade quickly. Because pure gold does not change and is always pure, a very high gold value or price is justified. The gold price used in this study is the gold price in Indonesia.

Data Analysis Techniques

The Error Correction Model (ECM) was employed in this study to determine the short-term and long-term impacts of the independent variable on the dependent variable.

1. Stationarity Test

Stationarity is the essential prerequisite in econometric models for time series data. Static data shows that the mean, variance, and autocovariance (on the lag variation) remain the same at any time the data is formed or used, meaning that with static data, the time series model can be said to be more stable. If the data used in the model is not stationary, it is reconsidered for its validity and stability. The method that econometricians widely used to test the stationary problem of data is to use a unit root test.

The root test is used to see if any of the estimated autoregressive model's coefficients have a value of one or not. The first step is to calculate each variable's autoregressive model. The Augmented Dickey-Fuller (ADF) test was employed in this study to examine the data's behavior. The ADF test begins with estimating the model for each variable involved.

2. Cointegration Test

This co-integration test is used to examine whether the independent variable and the dependent variable have a long-term relationship. The co-integration test is used to determine whether the regression residual is stationary. the method used in this study is the Engle Granger test method, and to perform the Engle Granger test, the following equation regression must be carried out.

$$Y_t = \beta_0 + \beta_1 X_t + e_t$$

Moreover, after getting the residuals, then tested with DF and ADF with the following equation:

$$\Delta e_t = \beta_1 e_{t-1}$$

$$\Delta e_t = \beta_1 e_{t-1} + \sum_{i=2}^p a_i \Delta e_{t-1+i}$$

From the estimation results, the statistical value of DF or ADF is compared with the critical value, where the statistical value of DF and ADF is obtained from the β_1 coefficient.

3. Error Correction Model (ECM)

The ECM model is used to determine the long-term and short-term equilibrium regression equations and whether or not a model is consistent. Furthermore, the ECM model addresses data issues associated with false and non-stationary time series data. This study's ECM regression model is as follows:

a. Long term equation

$$Y = a_0 + a_1 X_{1t} + a_2 X_{2t} + a_3 X_{3t} + a_4 X_{4t} + a_5 X_{5t} + u_t$$

Information:

- Y = Jakarta Islamic Index (JII)
- X₁ = Inflation
- X₂ = Exchange rate
- X₃ = Bi Rate
- X₄ = OIL PRICE
- X₅ = Gold Price
- U_t = residual value (previous period)

b. Short term equation

$$\Delta Y = \beta_0 + \beta_1 \Delta X_{1t} + \beta_2 \Delta X_{2t} + \beta_3 \Delta X_{3t} + \beta_4 \Delta X_{4t} + \beta_5 \Delta X_{5t} + \beta_6 RESID + u_t$$

Information:

- Y = Jakarta Islamic Index (JII)
- X₄ = OIL PRICE



$X_1 = \text{Inflation}$ $X_2 = \text{Exchange rate}$ $X_3 = \text{Bi Rate}$ $X_5 = \text{Gold Price}$ $U_t = \text{residual value (previous period)}$

4. Error Correction Terms (ECT)

ECT investigation. It is one of the elements of the ECM method's dynamic analysis. The ECT value is calculated by subtracting the previous month's dependent variables from the previous month's independent variables. This is done to determine how much the association between variables has in the short and long term. Suppose the ECT value is positive and substantial. In that case, the ECT model or data is legitimate and may explain the independent variables according to the ECT criteria.

5. Classical Assumption

Test Classical assumption test is used to determine the condition of the data used in the study. So that the regression model used shows a valid relationship equation or BLUE (Best Linear Unbiased Estimator). Therefore, the model must meet the basic feasibility assumptions of the classical, Ordinary Least Square (OLS).

a. Multicollinearity Test

Ghozali (2005:91), This test is used to see if there is a correlation between independent variables in a regression model. There should be no correlation between independent variables in a decent regression model. The tolerance value or variance inflation factor can be used to determine the existence or absence of multicollinearity in a regression model (VIF).

b. Heteroscedasticity

The heteroscedasticity test determines whether inequality of variance between the residuals of one observation and those of another in the regression model is available. If the correlation result's significance is less than 0.05, the regression equation has heteroscedasticity and vice versa.

c. Normality Test

The normality test determines whether or not data is regularly distributed. The data normality test is carried out by examining the standard probability plot, which compares the actual data's cumulative distribution with the normal distribution. The normal distribution will produce a straight diagonal line, which will be compared to the plotted data. The actual data will follow the diagonal line if the data distribution is normal.

d. Autocorrelation

The Autocorrelation is used to see if there is a link between the confounding error of period t and the error of period 1 in a linear regression model (previous). An

autocorrelation problem occurs when there is a correlation. A model that is free of Autocorrelation is a good regression model. Statistical tests such as the Durbin-Watson test (DW test) can detect Autocorrelation (Ghozali, 2005: 96).

Results and Discussion

Stationarity Test (ROOT TEST)

The data stationarity test is an important step in analyzing time series data. Unit root test results in levels can be seen in Table 1.

Table 1. Unit Root Test

Adf Test Statistic (Max Lag = 12)				
No	Variable	LEVEL		
		T-Statistic	Probability	Information
1	JII	-2.234849	0.1952	Unstationary
2	Inflation	-10.79250	0.0000	Stationary
3	Exchange Rate	-2.152525	0.2249	Unstationary
4	Bi Rate	-0.895326	0.7867	Unstationary
5	Oil Price	-2.386110	0.1478	Unstationary
6	Gold Price	-1.323002	0.6172	Unstationary
Test	1%		-3.486064	
Critical	5%		-2.885863	
Value	10%		-2.579818	

Because, Stationarity test results at that level indicate that 5 variables are not stationary. except for the inflation variable, because the probability value is greater than the 5% alpha value. then the root test should be continued at a different level (level 1). The data stationarity test results in the table show that all data used in the study are stationary at the first difference level. This is because the probability value is smaller than the alpha of 5%.

Table 2. Root Test At Level 1 (First Difference)

Adf test statistic (max lag = 12)				
No	variable	1 st difference		
		t-statistic	Probability	Information
1	JII	-9.846012	0.0000	Stationary
2	Inflation	-10.57027	0.0000	Stationary
3	Exchange Rate	-10.50903	0.0000	Stationary
4	BI Rate	-6.805038	0.0000	Stationary
5	Oil Price	-7.338256	0.0000	Stationary
6	Gold Price	-10.62724	0.0000	Stationary
	1%		-3.486551	

Test	5%	-2.886074
critical value	10%	-2.579931

Cointegration Test

Table 3. Results of JII Cointegration Test

Date: 04/16/22 Time: 00:59				
Sample (adjusted): 2012M06 2021M12				
Included observations: 115 after adjustments				
Trend assumption: Linear deterministic trend				
Series: JII INFLATION EXCHANGE RATE BIRATE OIL_PRICE GOLD_PRICE				
Lags interval (in first differences): 1 to 4				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.291124	96.14372	95.75366	0.0470
At most 1	0.163511	56.57515	69.81889	0.3552
At most 2	0.141254	36.04287	47.85613	0.3942
At most 3	0.070366	18.53040	29.79707	0.5271
At most 4	0.060750	10.13953	15.49471	0.2702
At most 5	0.025174	2.932039	3.841466	0.0868
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.291124	39.56856	40.07757	0.0570
At most 1	0.163511	20.53229	33.87687	0.7188
At most 2	0.141254	17.51246	27.58434	0.5361
At most 3	0.070366	8.390876	21.13162	0.8782
At most 4	0.060750	7.207487	14.26460	0.4649
At most 5	0.025174	2.932039	3.841466	0.0868
Max-eigenvalue test indicates no cointegration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

The results of the co-integration test in the table are derived from the residuals that are stationary tested at the first different level which indicates that the data used is cointegrated. This is because the probability value is below the alpha of 5%. Hence, the data can proceed to the next stage.

Table 4. Results of Ect Unitroot Level

Null Hypothesis: ECT has a unit root					
Exogenous: Constant					
Lag Length: 0 (Automatic - based on SIC, maxlag=12)					
			t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic			-3.978129	0.0021	
Test critical values:	1% level		-3.486064		
	5% level		-2.885863		
	10% level		-2.579818		
*MacKinnon (1996) one-sided p-values.					
Augmented Dickey-Fuller Test Equation					
Dependent Variable: D(ECT)					
Method: Least Squares					
Date: 04/15/22 Time: 14:10					
Sample (adjusted): 2012M02 2021M12					
Included observations: 119 after adjustments					
	Variable	Coefficient	Std. Error	t-Statistic	Prob.
	ECT(-1)	-0.234372	0.058915	-3.978129	0.0001
	C	0.313552	2.921071	0.107342	0.9147
R-squared		0.119145	Mean dependent var		0.280440
Adjusted R-squared		0.111616	S.D. dependent var		33.80754
S.E. of regression		31.86500	Akaike info criterion		9.777557
Sum squared resid		118799.2	Schwarz criterion		9.824265
Log likelihood		-579.7647	Hannan-Quinn criter.		9.796524
F-statistic		15.82551	Durbin-Watson stat		1.732075
Prob(F-statistic)		0.000121			

Based on the results of the processed eviews above, it shows that there is co-integration. It means that there is a short-term and long-term relationship in the ect test with an r-square of 0.119145 so that it can proceed to long-term and short-term regression testing.

Error Correction Model (ECM)

1. JII long-term regression Analyst

Table 5. Long-Term Analysis of JII

Dependent Variable: JII					
Method: Least Squares					
Date: 04/15/22 Time: 14:08					
Sample: 2012M01 2021M12					
Included observations: 120					
	Variable	Coefficient	Std. Error	t-Statistic	Prob.
	Inflation	-0.043496	0.059195	-0.734794	0.4640
	Exchange Rate	-0.007956	0.004229	-1.881505	0.0625
	BIRATE	-24.79338	5.283630	-4.692489	0.0000
	Oil_Price	-0.638501	0.320869	-1.989912	0.0490
	Gold_Price	-0.276524	0.031079	-8.897561	0.0000
	C	1331.701	107.7306	12.36140	0.0000

R-squared	0.453779	Mean dependent var	643.3131
Adjusted R-squared	0.429822	S.D. dependent var	67.11825
S.E. of regression	50.68107	Akaike info criterion	10.73769
Sum squared resid	292817.1	Schwarz criterion	10.87706
Log likelihood	-638.2613	Hannan-Quinn criter.	10.79429
F-statistic	18.94136	Durbin-Watson stat	0.460620
Prob(F-statistic)	0.000000		

2. JII Short-Term Regression Analyst

Table 6. JII Short-Term Analysis

Dependent Variable: D(JII)				
Method: Least Squares				
Date: 04/15/22 Time: 14:14				
Sample (adjusted): 2012M02 2021M12				
Included observations: 119 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Inflation)	-0.025621	0.019873	-1.289244	0.2000
D(Exchange Rate)	-0.030921	0.007395	-4.181541	0.0001
D(BIRATE)	-16.74978	8.147605	-2.055792	0.0421
D(Oil_Price)	-0.041671	0.420204	-0.099168	0.9212
D(Gold_Price)	0.032578	0.038425	0.847842	0.3983
ECT(-1)	-0.126999	0.047380	-2.680420	0.0085
C	1.291378	2.226255	0.580067	0.5630
R-squared	0.256598	Mean dependent var	-0.004370	
Adjusted R-squared	0.216773	S.D. dependent var	27.13250	
S.E. of regression	24.01229	Akaike info criterion	9.252031	
Sum squared resid	64578.08	Schwarz criterion	9.415509	
Log likelihood	-543.4958	Hannan-Quinn criter.	9.318414	
F-statistic	6.443133	Durbin-Watson stat	1.909644	
Prob(F-statistic)	0.000007			

Classical Assumption Test

1. Multicollinearity

Table 7. Multicollinearity Analysis

Variance Inflation Factors			
Date: 04/15/22 Time: 14:22			
Sample: 2012M01 2021M12			
Included observations: 120			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	11605.88	542.2106	NA
Inflation	0.003504	1.057358	1.036167
Exchange Rate	1.79E-05	142.5848	2.508960
BIRATE	27.91675	42.97307	2.453713
Oil_Price	0.102957	23.16271	2.392204
Gold_Price	0.000966	98.91639	2.255712

Based on the results of the multicollinearity estimation above, it can be concluded that all variables have no multicollinearity problem in the JII prediction model, because the VIF value is smaller than 10 so that it is free from multicollinearity.

2. Autocorrelation

Table 8. Autocorrelation Analysis

Dependent Variable: JII				
Method: Least Squares				
Date: 04/15/22 Time: 14:21				
Sample: 2012M01 2021M12				
Included observations: 120				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1331.701	107.7306	12.36140	0.0000
Inflation	-0.043496	0.059195	-0.734794	0.4640
Exchange Rate	-0.007956	0.004229	-1.881505	0.0625
BIRATE	-24.79338	5.283630	-4.692489	0.0000
Oil_Price	-0.638501	0.320869	-1.989912	0.0490
Gold_Price	-0.276524	0.031079	-8.897561	0.0000
R-squared	0.453779	Mean dependent var		643.3131
Adjusted R-squared	0.429822	S.D. dependent var		67.11825
S.E. of regression	50.68107	Akaike info criterion		10.73769
Sum squared resid	292817.1	Schwarz criterion		10.87706
Log likelihood	-638.2613	Hannan-Quinn criter.		10.79429
F-statistic	18.94136	Durbin-Watson stat		0.460620
Prob(F-statistic)	0.000000			

Based on the results of autocorrelation. Because the Durbin-Watson state value is 0.460620 > compared to the value of = 10% in the regression above, there is no autocorrelation problem or acceptance of H0.

3. Heteroscedasticity

Table 9. Heteroscedasticity Analysis (Glejser Test)

Heteroskedasticity Test: Glejser			
F-statistic	3.522779	Prob. F(5,114)	0.0053
Obs*R-squared	16.05961	Prob. Chi-Square(5)	0.0067
Scaled explained SS	14.19517	Prob. Chi-Square(5)	0.0144

Based on the results of testing the data above, it shows that in the heteroscedasticity test, according to the lesser test, there is a heteroscedasticity problem due to prob. Chi-square is 0.0067 > than the value of =10%. Therefore, it is necessary to use the natural logarithm transformation model for heteroscedasticity testing.

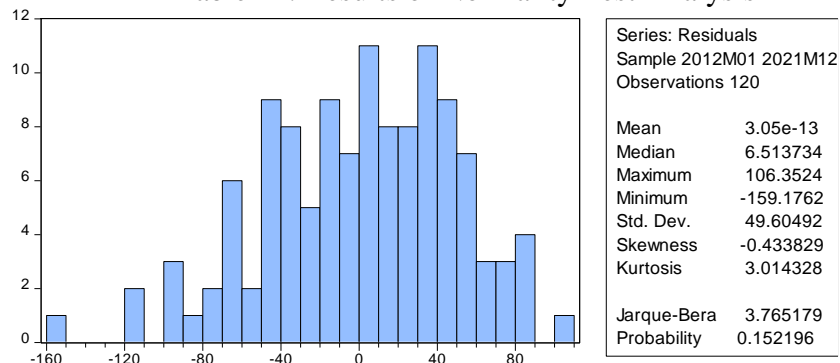
Table 10. Heteroscedasticity Analysis (Glejser Log Test)

Heteroskedasticity Test: Glejser			
F-statistic	2.316857	Prob. F(5,114)	0.0480
Obs*R-squared	11.06917	Prob. Chi-Square(5)	0.0500
Scaled explained SS	9.445486	Prob. Chi-Square(5)	0.0926

Based on the data above, which has been analyzed using the glejser test, it can be concluded that the regression model is homoscedastic or in other words there is no problem with the assumption of non-heteroscedasticity because prob. Chi-square is $0.0500 >$ than the value of $=10\%$.

4. Normality Test

Table 11. Results of Normality Test Analysis



The graph above shows that the prob value of the JII normality test is $0.152196 \geq 10\%$. It can be concluded that the regress result has no problem with the normal distribution or accepts H_0 .

Inflation Against JII

1. Short Term

The short-term inflation coefficient is -0.025621 , and the t-statistic value of the inflation variable is -1.289244 with a probability of 0.2000 . This indicates that the exchange rate variable has no effect on the confidence levels of 5% and 10% , implying that there is no short-term association (hypothesis)

2. Long-Term

The long-term inflation coefficient is -0.043496 , and the t-statistic value is -0.734794 with a probability of 0.4640 . This means that the inflation value variable does not affect the confidence levels of 5% and 10% , implying that the inflation variable and JII have no long-term correlation.

3. Interpretation

The results of the regression analysis of the ECM model in both the short and long term show that inflation has a negative relationship and has no effect on economic growth. It is not in line with research Boediono (2014) and Hanny (2018), which state that inflation has a favorable or positive impact on JII. Inflation that is not too high will stimulate job

growth. Companies can adjust production costs and increase the prices of goods and services so that it will not impact the company's revenue generation and profit potential. It is different from the research of Utami & Herlambang (2017) that inflation will result in poorer company performance, lead to lower stock prices and a possible decline in the stock market index. If inflation rises, the minimum return on stock investment will also increase and lower market valuations. Under these conditions, the stock price will fall to a point sufficient to offset the expected inflation. **Thus the results of this study reject H1, which states that inflation has a positive effect on JII.**

Inflation is a continuous increase in prices and can impact economic conditions. However, in reality, inflation cannot directly affect stock price conditions when inflation increases that are not sharp and prolonged, the impact on the economy is not too significant. As happened when approaching the feast of Eid al-Fitr and Ramadan. The results of this study indicate that inflation is potentially harmful to stock prices. However, this condition does not always occur every time inflation has increased. Inflation can affect stock prices when it can significantly affect the economy and company performance, as happened in 2015.

Since February 2015, inflation has been increasing and causing commodity prices to soar. The economic condition at that time was considered not good enough; it was proven that Indonesia's economic growth in 2015 yoy was only 4.79% and becoming the lowest since 2010. Household consumption also decreased and only 4.96%. Inflation that occurred throughout 2015 was inflation that attacked the Shousehold sector, such as processed food, beverages, and food prices. This affects the performance of companies that are incorporated in the stock market. This is because companies, especially commodity producers/consumers that are hit by inflation, have increased operating expenses. Stock prices can indeed be affected by inflation, but inflation is not the only factor that can affect stock prices

Exchange Rate Against JII

1. Short Term

The short-term exchange rate variable has a t-statistic value of -4.181541 with a probability of 0.0001 and a short-term exchange rate coefficient of -0.030921. The exchange rate variable (exchange rate) is significant at the 5% confidence level, implying that the exchange rate variable (exchange rate) and JII have a short-term correlation.

2. Long Term

The long-term exchange rate (exchange) variable's t-statistic value is -1.881505 with a probability of 0.0625, and the derived long-term exchange rate coefficient (exchange rate) is -0.007956. It implies that the economic situation variable has no substantial effect on the confidence levels of (5%) and (10%). Moreover, the exchange rate variable (exchange rate) and the JII have no long-term correlation.

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3. Interpretation

Based on the analysis of the short-term and long-term ECM models, the results show that the exchange rate has a negative effect on JII. **Thus the results of this study accept H2, which states that the exchange rate affects JII.** according to Ayu Tri Utami and Leo Her-Lambang (2016). Found that the exchange rate had a negative effect on the ISSI index (Sharia Stock Index). When the demand for the product increases in a foreign market, it can increase domestic companies' cash flow, causing the stock's value to rise. Conversely, if the issuer imports raw materials for manufacturing from outside and has debt in dollars, its share price will fall. Interest rates, according to Sudjana (2014), have a negative impact on the Jakarta Composite Index (JCI). Changes in exchange rates can affect stock prices in the capital market but the effect can be received differently by issuers. This is because the exchange rate is only used by companies that carry out trade transactions in international markets in the form of exports and imports. When the exchange rate of the rupiah against the dollar increases, of course, the importing company will experience an increase in operating costs and may reduce production performance or possibly increase the price of the commodity produced.

The law of demand contained in economics plays its role, when the price of a commodity/goods increases, the demand will decrease and affect the company's return which is one of the factors for making investor decisions in investing. According to Robert S. Pindyck in his book *Microeconomics*, a product's low price can make buyers buy in larger quantities (Pindyck, 2005).

Bi-Rate Against JII

1. Short Term

The BI Rate variable's t-statistic value is -2.055792, with a chance of 0.0421 and a short-term BI Rate coefficient of -16,74978. This implies that the interest rate variable has a considerable effect on the confidence level of 5% and that the interest rate variable and JII no short-term relationship.

2. Long Term

Nilai The long-term BI Rate variable has a t-statistic value of -4.692489 with a probability of 0.0000, and the long-term coefficient is -24.79338. This shows that the interest rate variable has a 10% impact on the confidence level, implying that stock movements are also affected BI-RATE.

3. Interpretation

Based on the results of the regression analysis of the long- and short-term ECM model, it was found that the BI Rate had a negative effect on JII. **Thus the results of this study accept H3, which states that the BI Rate has a significant effect on JII.** According to the classical theory of interest rates, an increase in interest rates will be in line with the

level of public saving, but an increase in interest rates is inversely proportional to the level of investment. When interest rates increase, people will be more interested in allocating their funds to the banking sector to be stored as savings. Withdrawal of funds from the investment sector can occur because when interest rates rise, inflation will also increase and cause the company's operating costs to increase, as was done by Bank Indonesia during the crisis due to the Covid-19 2020 pandemic, where BI suppressed the BI Rate at 3.50% to suppress inflation and encourage economic recovery.

Oil Prices Against JII

1. Short Term

The short-term oil price coefficient is -0.041671, the variable t-statistic value is -0.099168 with a probability of 0.9212. This shows the world oil price variable has no effect on the 5% confidence level, indicating that there is no short-term relationship between the world oil price variable and JII.

2. Long Term

t-statistic value of the long-term Oil Price variable is -1.989912 with a probability of 0.0490, and the long-term Oil Price coefficient is -0.638501. This means that the world oil price variable has a significant effect on the confidence level of (5%) and implies that there is a positive long-term relationship between the world oil price variable and JII, where if Oil Price increases by one percent, it will increase JII by 0.638501 percent, or On the other hand, if Oil Price decreases by 1%, it will decrease JII by 0.638501%

3. Interpretation

Based on the results of the regression analysis of the ECM model that has been carried out, it is known that world oil prices have a negative effect on JII. **Thus the results of this study accept H4, which states that world oil prices have a negative effect on JII.** This is in line with Yudhistira Ardana's research (2016) that oil prices negatively impact the Jakarta Islamic Index for oil-exporting countries and mining businesses. An increase in oil prices is beneficial because it can attract investment. However, unlike companies outside the mining sector, an increase in oil prices can result in losses for companies due to increased operating costs. The world oil price is one indicator for determining a country's fuel price, especially oil importing countries such as Indonesia. When world oil prices rise, import prices will also increase, which will increase operating costs and increase the company's production costs. However, in general, the increase in oil prices will impact the decline in stock prices because the company's operational and production costs tend to increase. This situation brings the company to a dilemma, accepting reduced company profits due to increased production costs or increased product prices because product demand decreases as the law of demand applies.



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Gold price Against JII

1. Short Term

t-statistic value of the gold price variable with a probability of 0.3983 and a short-term gold price coefficient of 0.032578. This means that the gold price variable has no effect on the confidence level of (5%) and implies that there is no short-term relationship between the world gold price variable and JII.

2. Long Term

t-statistic value of the long-term gold price variable is -8.897561 with a probability of 0.000, and the long-term gold price coefficient is -0.276524. This means that the gold price variable has a significant effect on the confidence level of (5%) and implies that there is a positive long-term relationship between the world oil price variable and JII.

3. Interpretation

Based on the results of the regression analysis of the ECM model, it is known that the world gold price has a positive effect on JII in the short and long term. Thus, the results of this study accept H5 which states that the world gold price positively affects JII. The positive influence of world gold prices on the Jakarta Islamic Index is also stated by Utoyo and Ridwan (2016) gold is a form of investment that is almost risk-free; gold investment is one of the profitable commodities and is in demand by the public society because the price tends to rise. World gold prices can affect stock prices because gold is a commodity that is used as an investment object, and gold prices can also be an indicator of stock price predictions for financial sector investment. However, this will only happen in a short time, the behavior of investors in making investment decisions can affect the relationship between the two. When the gold price described by the stock index experiences a decline and decline in the long term, re-oriented investors will undoubtedly shift their investment to other sectors, and it is undeniable that they can shift their stock investment to gold investment. Where this will make the demand for the gold increase, and the price will increase.

Conclusion

The following conclusions are based on this research and answer the research questions of this analysis:

1. Inflation variables, oil prices, and gold prices do not have a short-term relationship. However, the long-term correlation between the oil price variable and the gold price is strongly negative.
2. The exchange rate and the rate variable have a short-term relationship that is compensated for the long-term relationship, resulting in a strongly negative implication between the exchange rate interest rate variable and JII.
3. The inflation variable and JII do not have a short-term or long-term relationship.



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4. The BIRATE and JII variables have short-term and long-term relationship.
5. There is no short-term relationship between the variables of world oil prices, gold price, and JII, but the relationship between the variables of world oil prices and JII is positively significant when corrected for the long-term relationship.

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