

The Effect of Inflation, Indonesia Crude Price, and Indonesia Sharia Stock Index on Sharia Mutual Funds in Indonesia: A Multidimensional Analysis and VECM Approach

ABSTRACT

This study intends to determine the short-term and long-term effects of Inflation, Indonesia crude price, Indonesia sharia stock index on sharia mutual funds in Indonesia. This research utilized secondary data from January 2014 - December 2023 sourced from the Financial Services Authority, Central Agency on Statistics, Ministry of Energy and Mineral Sources of the Republic of Indonesia. This study uses long run and short run VECM tests. Results of the long-run VECM estimates indicate that the Inflation variable and the Indonesia sharia stock index have a long-term significant positive effect on Islamic mutual funds in Indonesia. While the Indonesian crude price has a long-term significant negative effect on Islamic mutual funds in Indonesia. The short run VECM estimation results show that there are no variables that affect Islamic mutual funds in Indonesia. Granger causality test reveals the causal relationship between various variables on Islamic mutual funds. The conclusions obtained can be used as a reference for potential investors in making investment decisions for the short and long term.

Keywords: Inflation; Indonesia Sharia Stock Index; Indonesia Crude Price; NAV Sharia Mutual Funds; VECM.

1. INTRODUCTION

Islamic mutual funds are a type of financial instrument in the capital market, as defined in fatwa no. 20/DSN-MUI/IV/2001. These funds adhere to Islamic sharia principles and are governed by contracts between investment managers and investment users, with the shahib al-mal acting as the owner of the assets. The popularity of Islamic mutual funds in Indonesia as an investment option is evident from the substantial growth in net asset value, which has reached IDR 42.78 trillion, and the significant increase in the number of Islamic mutual funds, which now stands at 273 as of 2023. Sukirno, as cited in Sukma et al. (2023), identifies several macroeconomic factors that can influence the performance of Islamic mutual fund net asset value (NAV). These factors include inflation, the exchange rate of the Indonesian rupiah, money supply, Sharia Bank Indonesia Certificates (SBIS), BI 7 Days Repo Rate, Islamic securities (sukuk), Jakarta Islamic Index (JII), consumer price index, return, risk level, and the price of gold and Indonesian crude oil. Investment managers frequently take into account the fluctuations of various macroeconomic elements while making investment choices.

Hence, this study aims to examine the impact of macroeconomic variables, specifically inflation, Indonesian crude oil prices, and the Indonesian Sharia stock index, on Islamic mutual funds, as shown by their net asset value.

Inflation is the persistent rise in costs of goods and services, resulting in a decline in people's ability to buy things. According to Fitriyani et al. (2020), this indicates that higher prices do not necessarily align with higher revenues. In Indonesia, inflation exerts a substantial influence on the rate of investment expansion. Continued inflationary trends have a detrimental impact on investors, since it leads to a persistent increase in the cost of investing. On the other hand, as inflation drops, the expense of investment also decreases. Hence, the stability of the inflation rate is of utmost importance in fostering investment growth in Indonesia.

Research undertaken by Nofrianto and Yutegi (2022) indicates that the pandemic has caused a delay in economic activity and led to decreased returns for Islamic investment instruments, namely the net asset value (NAV) of Islamic stock mutual funds. Factors such as the Jakarta Islamic Index (JII), trading volume, and mutual fund age experience a negative impact as compared to inflation and exchange rates. In their study, Adrian & Rachmawati (2019) found that inflation has a partial effect on the net asset value (NAV) of Islamic mutual funds. Conversely, Alifa & Ferli (2022) discovered that inflation has a beneficial impact on the growth of fixed-income mutual fund performance. Higher inflation affects the performance of fixed-income mutual funds.

Research by Sholeha & Fadhlillah (2023) and Kurniawan (2019) aimed to investigate the impact of inflation on the NAV of Sharia Mutual Funds, motivated by the need to understand how macroeconomic factors influence Islamic finance products. Their findings indicate that inflation positively affects the NAV of Sharia Mutual Funds, supported by findings from Sumantyo & Savitri (2019) in both Indonesia and Malaysia. However, contrasting results were found by Budhijana (2023) and Ardana (2023), who showed that inflation negatively impacts the NAV, aligning with research by Hermawan & Wiagustini (2016). Several studies, including Miha & Laila (2017), Sukarno & Herlianto (2022), and Aldiansyah et al. (2021), concluded that there is no influence of inflation on the NAV of Sharia Mutual Funds, supported by Alim et al. (2021) and Hasanah et al. (2020), which indicate no long-term relationship between inflation, interest rates, and exchange rates on Islamic mutual funds. Similarly, Azzahra & Arianti (2021) and Benget (2021) found no impact of inflation on the NAV.

The objective of exploring Indonesia's crude oil prices and their impact on mutual funds was driven by the need to comprehend the effects of commodity price fluctuations on financial markets. Rising oil prices lead investors to choose the capital market, thereby increasing equity mutual fund returns. External events like global oil tariff increases and movements in global stock indices, as well as events like the Subprime Mortgage crisis, influence investor behavior and returns (Muhammad Farid, 2014, cited in Hasibuan et al., 2019). Miha & Laila (2017) and Othman et al. (2015, cited in Rifai & Achmad, 2020) found that Indonesia's crude oil price affects the NAV of Sharia Mutual Funds in the long term, though Nugraha et al. (2023) found no evidence of short-term effects. The Indonesia Sharia Stock Index (ISSI) reflects corporate performance and influences the NAV of Sharia Mutual Funds, with increased corporate earnings encouraging higher returns (Aldiansyah et al. 2021; Sulistiyowati & Barnard, 2016). However, Adiputro & Sutrisno (2020) found that the performance of Sharia Mutual Funds from 2015 to 2019 was negatively affected by the ISSI.

Given the mixed findings in the literature and the significant role of inflation, crude oil prices, and stock indices in financial markets, it is essential to conduct a comprehensive study that simultaneously examines these factors. By employing the Vector Error Correction Model (VECM) approach, this study seeks to provide a more nuanced understanding of the dynamic relationships among these variables and their collective impact on Sharia mutual funds in Indonesia. This comprehensive analysis is crucial for investors, policymakers, and financial managers to make informed decisions in the rapidly evolving economic landscape.

2. MATERIALS AND METHODS

This research is intended to measure the effect of inflation, Indonesia's crude price, and the Indonesian Islamic stock index on Islamic mutual funds proxied by net asset value. It is possible to compare the long-term and short-term effects using the Vector Error Correction Model (VECM). In addition, this research uses the VECM Granger causality method to see how the variables interact causally. This research relies heavily on secondary sources of information to make it easier to compare past results with current trends. by using secondary data from January 2014 to December 2023, with data obtained from the Financial Services Authority (2023), the Ministry of Energy and Mineral Resources of the Republic of Indonesia (2024), and the Central Bureau of Statistics (2024), which results in a robust analytical framework. This analysis aims to provide a comprehensive discussion of the short-term and long-term impacts.

2.1 Model Specification

Simple equation estimation model:

$$NAV = f(INF, ICP, ISSI)$$

The econometric model can be written as follows:

$$NAV_i = \beta_0 + \beta_1 INF_i + \beta_2 ICP_i + \beta_3 ISSI_i + \varepsilon$$

The econometric model is transformed into logs and the general form of this study is as follows

$$\text{Log} NAV_i = \beta_0 + \beta_1 INF_i + \beta_2 \text{Log} ICP_i + \beta_3 \text{Log} ISSI_i + \varepsilon$$

Where β_0 is a constant, $\beta_1, \beta_2, \beta_3$ regression coefficient, i represents the *time series* from January 2014 to December 2023 and ε is the error rate. NAV represents the net asset value of Islamic mutual funds, Inf means inflation, ICP (Indonesia crude price) and ISSI is the Indonesian Sharia stock index.

2.2 Variables Description and Their Measures

The dependent variable of this research is Islamic mutual funds proxied by NAV (net asset value). The independent variable consists of Inflation, Indonesia crude price, and Indonesia Sharia stock index.

2.3 Estimation Techniques

The analytical tool used is the VECM test which utilizes Eviews 12. It is intended to measure the long-term and short-term impact of several independent variables on the dependent variable with a time series of January 2014 to December 2023.

2.3.1 Unit Root Test

Stationarity test or unit root test is a necessary thing used in time series data. A data set is considered stationary if the mean and variance of the time series data do not change systematically over time, or some experts say that the mean and variance are constant. (Nachrowi and Haridus Usman, 2006). The technique used to test stationarity is the ADF (Augmented Dickey-Fuller) test. Unit root test if it does not reject H_1 or the presence of stationary if $\text{prob} < 0.05$.

2.3.2 Cointegration Test

Cointegration theory was first proposed by Granger (1981), which addresses the issue of determining long-run economic equilibrium relationships. Cointegration is the statistical implication of the existence of long-run linkages between economic variables. The main objective of the cointegration test is to check whether the residuals of the cointegrated regression are stationary or not (Istiqomah & Mansoer, 2005). According to Johansen and Juselius, "If one is cointegrated, this means that the errors in the regression model are stationary even though the dependent and independent variables are non-stationary, hence the inference of a long-run relationship."

2.3.3 Granger Causality

This stage involves using the Granger causality test to determine whether an endogenous variable can be treated as an exogenous variable. This stems from the unknown impact between variables. If there are two variables Y and X, then either Y affects X or X affects Y, or both have an effect or neither.

2.3.4 Vector Error Correction Model

If a long-run relationship is realized, the model can be estimated using a vector error correction model (VECM) which allows for separation of the long-run relationship and also the ECT which shows the speed of adjustment of the variables used to return to the equilibrium position. This study used VECM to estimate the results of the three research variables. The long-run relationship VECM model is used to estimate the result of the first objective. VECM Granger causality is used to determine the direction of causality between variables.

VECM Long Run

The following is the VECM long-run relationship equation:

$$\text{Log NAV}_i = \beta_0 + \beta_1 \text{Log INF}_i + \beta_2 \text{Log ICP}_i + \beta_3 \text{Log ISSI}_i + \varepsilon$$

VECM Short Run

The following is the VECM short-run relationship equation:

$$D(\text{Log NAV})_i = \beta_0 + \beta_1 D(\text{INF})_i + \beta_2 D(\text{Log ICP})_i + \beta_3 D(\text{Log ISSI})_i + \varepsilon$$

2.3.5 Impulse Response Analysis

This stage involves analyzing the response of a variable in the presence of a shock to itself or another variable.

2.3.6 Variance Decomposition Analysis

This stage involves analyzing the proportion of influence a variable has when it is subjected to shocks or changes in itself over a period.

3. RESULTS AND DISCUSSION

The Jarque-Bera test statistic fails the null hypothesis of the normal distribution of each variable ($P > 0.05$), which confirms that the data is normally distributed. The heteroscedasticity and autocorrelation tests have passed the HAC Newey-Test which corrects the standard errors and results in valid estimates and reliable regression coefficients. It also passed the multicollinearity $VIF < 10$ and linearity ($P > 0.05$) tests.

3.1 Unit Root Test

The ADF test is performed by comparing the calculated t statistic and the Mackinnon critical value at the 5% significance level. With trend and intercept, the results in Table 1 show that all series are non-stationary in level form and become stationary at the first difference level.

3.2 Cointegration Test

The Cointegration Test will determine whether the study can use the VECM test or not. Determination of the presence or absence of cointegration if $\text{prob} < 0.005$. From Table 2 cointegration based on the trace test $\text{prob} 0.0000 < 0.05$ means rejecting H_0 . Rejection of H_0 means that there is a long-term relationship between Inflation, Indonesia crude price, the Islamic stock index, and Islamic mutual fund NAV.

The max eigen statistic cointegration test results in Table 3 have a prob of $0.0000 < 0.05$, which means rejecting H_0 and accepting H_1 cointegration. Rejection of H_0 means that there is a long-term relationship between Inflation, Indonesia crude price, the Islamic stock index, and Islamic mutual fund NAV. This means that VECM testing can be done.

3.3 Granger Causality Test

From the Granger causality test results in Table 4 presented below, none of the variables show a causal relationship. This is indicated by all p-value results > 0.05 .

3.4 Vector Error Correction Method

3.4.1 Vector Error Correction Method Long Run

After examining the long-run relationship in Table 5 between the variables. Then the long-run VECM model is used to estimate the model of this study because the variables in this study are cointegrated. This test observes the existence of a long-run relationship between Inflation, Indonesia crude price, and Indonesia Islamic stock index with the NAV of Islamic mutual funds.

The Effect of Long-Term Inflation on Islamic Mutual Funds

The results of the analysis are in line with the hypothesis that the t statistic value of the lag 1 Inflation variable is 4.35893 or greater than the t table value of 1.981 which means accepts H_1 and rejects H_0 so that the Inflation variable has a positive effect on long-term Islamic mutual fund NAV ($p < 0.05$), this is related to signalling theory where controlled inflation and followed by mutual funds that can provide returns that exceed the inflation rate can send positive signals to investors about good investment performance and prospects. This can attract investors to invest in these mutual funds. However, high inflation can cause a decrease in the real value of mutual fund investment returns, thus sending a negative signal to investors about the prospects of the mutual fund. (Merdad, Hassan, & Alhenawi, 2015). Inflation is harmless if it is predictable, as people will take into account the potential for future price increases when making decisions. Most economists agree that the economy will grow efficiently if inflation is low. In Islamic economics, controlling inflation is important to maintain economic stability and realize justice in financial transactions. High inflation can encourage people to seek investments that are more profitable and safe from falling currency values. This is in line with Islamic principles that recommend investing wealth in a halal and productive way. In Islam, investment is recommended to be done fairly, does not involve usury (interest), and is not speculative. Since inflation affects the value of money circulating in society, inflation has a positive impact on Islamic mutual funds in the long run. When inflation increases, the value of money circulating in society becomes less valuable, so people prefer to preserve the value of their money by investing their funds in Islamic mutual funds. As a result, inflation has a positive impact on Islamic mutual funds in the long run. Research conducted by Nofrianto & Yutegi (2022) shows that the pandemic delay economic activity and reduce the return of Islamic investment instruments, such as the NAV of Islamic stock mutual funds. JII, trading volume, and mutual fund age are negatively affected compared to inflation and exchange rates. Adrian & Rachmawati's research (2019) concluded that partial inflation has a relevant impact on the NAV of Islamic mutual funds. Alifa & Ferli's research (2022) found that inflation has a positive influence on the performance of fixed-income mutual funds, which means that if inflation increases, it will affect the performance of fixed-income mutual funds as well.

Research by Sholeha & Fadhlillah (2023) and Kurniawan (2019) that inflation has a positive effect on the Net Asset Value (NAV) of Islamic Mutual Funds. The results of this study are supported by Sumantyo & Savitri (2019) who

found that inflation has a positive effect on the NAV of Islamic mutual funds in Indonesia and Malaysia. However, Budhijana (2023) and Ardana (2023) have different research results that inflation is a negative effect on the NAV of Islamic mutual funds and this research is supported by the research results of Hermawan & Wiagustini (2016). Research by Miha & Laila (2017), Sukarno & Herlianto (2022), and Aldiansyah et al. (2021) have the same results that inflation has no effect on the NAV of Islamic mutual funds supported by research by Alim et al. (2021) and research conducted by Hasanah et al. (2020) show that there is no long-term relationship between inflation, interest rates, and exchange rate variables on Islamic mutual funds. The results of research by Azzahra & Arianti, (2021) show that inflation does not affect net asset value. Benget's research (2021) is to show that inflation has no effect on the net asset value of equity mutual funds.

The Effect of Long-Term Indonesia Crude Price on Sharia Mutual Funds

The analysis results are by the test criteria where the test statistic value of -4.41781 is greater than the t table value of 1.981 which means accepting H1 and rejecting H0 so that the Indonesia crude price lag 1 variable has a negative effect on the NAV of Islamic mutual funds. This is inversely proportional to signaling theory which states that changes in crude oil prices can be a signal for investors about investment prospects in mutual funds that have exposure to related sectors. For example, if crude oil prices increase, this can be a positive signal for mutual funds that invest in energy companies or other related sectors. Conversely, a decrease in the price of crude oil can be a negative signal for such mutual funds. The two-way relationship means that movements in mutual fund performance also signal movements in oil prices. Mutual funds should provide clear and accurate information about their exposure to sectors related to crude oil prices so that investors can make informed decisions. (Ahmed & Alrashidi, 2015). It is assumed that Indonesia crude price in the long run has less exposure because, in the long run, Islamic mutual fund portfolios are dominated by the money market, fixed income, and mixed Islamic sectors. While oil prices include Islamic stock mutual fund portfolios that have high risk, because also an increase in the price of Indonesian crude oil (ICP) can increase operational costs and production costs, companies can spend more money, reduce company profits, and reduce the net asset value of Islamic mutual funds in the long run. As a result, ICP has a negative impact on Islamic mutual funds in the long run. This is in line with (Antonio et al., 2013:393) which states that all aspects of the economy can be affected by oil prices, as well as research by Miha & Laila, (2017) that the Indonesia Crude Price influences the NAV of Islamic mutual funds. Research by Othman et al. (2015) in Rifai & Achmad (2020) resulted in oil prices affecting long-term NAV. However, research by Nugraha et al. (2023) states that world oil prices in the short term have no proven effect on mutual fund net asset value.

The Effect of Long-Term Indonesia Sharia Stock Index on Sharia Mutual Funds

The results of the analysis are in line with the hypothesis that the t statistic value of the lag 1 sharia stock index variable is 2.70047 or greater than the t table value of 1.981 which means accepting H1 and rejecting H0 so that the Indonesia sharia stock index variable has a positive effect on long-term Islamic mutual fund NAV, this is by signaling theory which states that the Indonesia sharia stock index can be a signal for investors about the prospects and potential returns of Islamic mutual funds that invest in stocks incorporated in the index. If the Islamic stock index increases, this can be a positive signal for investors that Islamic mutual funds that have a similar portfolio to the index have the potential to provide good returns. The composition and changes in the constituency of stocks in an Islamic index can also signal to investors about the investment strategy and asset allocation policy implemented by the investment manager of an Islamic mutual fund. This helps investors in assessing the suitability of Islamic mutual funds to their risk preferences and Shariah compliance. (Al-Hassan & Al-Rashid, 2020). The increase in ISSI reflects an increase in company performance that is getting better so that it has the opportunity to generate more increased profits. Increased company income will lead to increased returns on Islamic mutual funds. Thus, investors will invest their funds through Islamic mutual funds with the expectation of getting more returns. Since ISSI represents the performance of the Islamic stock market listed on the Indonesia Stock Exchange (IDX), the Indonesia Sharia Stock Index (ISSI) has a long-term positive effect on Islamic mutual funds. In the long run, ISSI can show stable and increasing performance, which means that Islamic mutual funds invested in Islamic stocks listed on ISSI can also show stable and increasing performance. Therefore, ISSI has a positive influence on the performance of Islamic mutual

funds. This research is in line with Aldiansyah et al. (2021) and research by Sulistiyowati & Barnas (2022), which states that the Indonesian Sharia Stock Index has a positive effect on the net asset value of Islamic mutual funds. However, this is different from the research of Adiputro & Sutrisno (2020) which shows that from 2015 to 2019, the performance of sharia mutual funds was negatively influenced by the Indonesian Sharia Stock Index (ISSI).

3.4.2 Short Run Vector Error Correction Model

After examining the long-run effect, we look at the short-run effect in Table 6 between Inflation, Indonesia crude price, and Indonesia Islamic stock index on the NAV of Islamic mutual funds. The VECM estimation results show that none of the variables have a short-term effect on the NAV of Islamic mutual funds.

The Effect of Short-Term Inflation on Islamic Mutual Funds

The estimation results indicate that there is no effect of the short-term lag 1 inflation variable on the NAV of Islamic mutual funds. This conclusion is based on the t statistic of -0.53044, which is smaller than the critical value of 1.981. Therefore, the null hypothesis (H0) is accepted and the alternative hypothesis (H1) is rejected, suggesting that there is no short-term influence of the lag 1 inflation variable on the NAV of Islamic mutual funds. The reason for this is that there is a weak association between short-term inflation movements and Islamic mutual fund investment instruments. Furthermore, in the immediate term, the performance of Islamic mutual funds is mostly affected by issues associated with business and the tangible economy, rather than short-term inflation. Islamic mutual funds achieve performance protection against inflation swings through diversification, since they allocate investors' cash into a range of investments. While inflation can influence the performance of Islamic mutual funds through many factors, it does not have any immediate impact on their performance. In the immediate term, inflation can lead to a rise in operational and production expenses, resulting in increased expenditure for corporations. Consequently, the company's earnings may decline, leading to a reduction in the net asset value of Islamic mutual funds. Furthermore, volatile inflation can generate considerable ambiguity for economic participants, therefore impacting investor enthusiasm for allocating assets to Islamic mutual funds. This aligns with the findings of Khusna et al. (2023), which indicate that inflation has only a partial impact on the Net Asset Value (NAV) of Islamic Stock Mutual Funds. Similarly, research conducted by Miha & Laila (2017), Sukarno & Herlianto (2022), and Aldiansyah et al. (2021) also shows the same results, showing that inflation affects the NAV of Islamic mutual funds. These findings are further supported by the research of Alim et al. (2021). A study conducted by Azzahra and Arianti (2021) demonstrates that inflation has no impact on the net asset value. Benget's 2021 study aims to demonstrate that inflation does not have a substantial impact on the net asset value of equities mutual funds. Contrary to the findings of Nofrianto & Yutegi's (2022) research, it is evident that the pandemic has caused a slowdown in economic activity and a decrease in the profitability of Islamic investment instruments, such as the net asset value (NAV) of Islamic stock mutual funds. The trading volume, JII, and mutual fund age experience a negative impact as compared to inflation and currency rates. The research conducted by Adrian & Rachmawati (2019) found that inflation affects the Net Asset Value (NAV) of sharia mutual funds. In a study conducted by Alifa and Ferli in 2022, it was discovered that inflation has a beneficial impact on the performance of fixed-income mutual funds. This implies that a growth in inflation would also affect the performance of fixed-income mutual funds. Studies conducted by Sholeha & Fadhlillah (2023) and Kurniawan (2019) have found that inflation has a favourable and substantial impact on the Net Asset Value (NAV) of Islamic Mutual Funds. The findings of this analysis are corroborated by Sumantyo & Savitri (2019), who demonstrate that inflation has a substantial beneficial impact on the net asset value (NAV) of Islamic mutual funds in Indonesia and Malaysia.

The Effect of Short-Term Indonesia Crude Price on Sharia Mutual Funds

The estimation results of the short-term Indonesia crude price lag 1 variable on the NAV of Islamic mutual funds show that there is no influence on the NAV of Islamic mutual funds because the t statistic result of 0.43206 is smaller than the t table of 1.981 so it accepts H0 and rejects H1 which means there is no short-term influence of the Indonesia crude price lag 1 variable on the NAV of Islamic mutual funds. ICP affects the performance of Islamic mutual funds in the long term, ICP does not affect Islamic mutual funds in the short term because ICP affects the company's operating costs and production costs, thus affecting the company's net asset value. In the short term, ICP does not have an impact on Islamic mutual funds because the performance of Islamic mutual funds is influenced by other variables, such as the BI rate and inflation. The portfolio of Islamic mutual funds is also dominantly spread across various economic sectors rather than

the oil and gas sector, so fluctuations in crude oil prices have no impact on the NAV of Islamic mutual funds. This is in line with the research of Nugraha et al. (2023) that world oil prices in the short term have no

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proven effect on the net asset value of mutual funds, but in contrast to the research of Miha & Laila, (2017) Indonesia Crude Price affects NAV of sharia mutual funds.

The Effect of Short-Term Islamic Stock Index on Islamic Mutual Funds

The estimation results indicate that there is no influence of the lag 1 variable of the Indonesian sharia stock index on the net asset value (NAV) of Islamic mutual funds. This is supported by the t statistic result of 0.16639, which is smaller than the critical value of 1.981. Therefore, the null hypothesis (H0) is accepted, and the alternative hypothesis (H1) is rejected. In other words, there is no short-term impact of the lag 1 variable of the Indonesian sharia stock index on the NAV of Islamic mutual funds. Investors in the short term pick Islamic firms based on their return and performance, but the Indonesian Islamic stock index uses DES as a reference instead of directly selecting Islamic stocks. Investors mostly utilise the Indonesian Sharia stock index as a benchmark for selecting investments with consistent performance. However, it does not directly impact Islamic mutual funds as their success is determined by investor purchasing choices. The short-term impact of ISSI on Islamic mutual funds is not considerable due to the influence of other factors, including the BI rate, inflation, and the Rupiah exchange rate, which can affect the fluctuations in Islamic stock prices. This contradicts the findings of Aldiansyah et al. (2021) investigation. According to Sulistiyowati & Barnas (2022), the Indonesian Sharia Stock Index has a notable and favourable impact on the net asset value of Islamic mutual funds. Adiputro & Sutrisno's (2020) study reveals that the performance of Islamic mutual funds saw a considerable negative impact from 2015 to 2019 due to the Indonesian Sharia Stock Index (ISSI).

3.5 Impulse Response Analysis

At the beginning of the period, namely the first month, the LOG(NAV) response fluctuates, namely responding positively and negatively (up and down) since the shock or shock to 4 variables, LOG(NAV), INF, LOG(ICP) and LOG(ISSI), but small fluctuations until approaching month 20 and beyond experiencing equilibrium or equilibrium.

At the beginning of the period, namely the first month until approaching month 15, the response of LOG(ICP) to itself decreased and began to reach equilibrium in month 15 onwards. The response of LOG(ICP) to LOG(NAV), LOG(ISSI), and INF increases in the first month until approaching month 15 and beyond.

At the beginning of the period, namely the first month, INF experienced a downward shock to itself and began to reach equilibrium as it approached month 20. INF's response to LOG(ICP) increased from the first month until it approached month 20. It began to reach equilibrium in month 21 and beyond. The INF response to LOG(NAV) and LOG(ISSI) decreased until approaching month 10 and began to reach equilibrium afterward.

At the beginning of the period, namely the first month to month 10, the LOG(ISSI) response fluctuates in the early months and begins to reach equilibrium as it approaches month 15 onwards. The response of LOG(ISSI) to LOG(ICP) fluctuates in increase and decrease and reaches equilibrium in the 15th month onwards. The response of LOG(ISSI) to LOG(NAV) and INF experienced a decline in the first month and began to reach equilibrium in the period approaching the 15th month onwards.

3.6 Variance Decomposition Analysis

VD LOG(NAV) analysis shows that the variable that is suspected to have the highest influence on LOG(NAV) in the 120 months ahead is LOG(NAV) itself with a contribution of in the first month of 100%, followed by LOG(ISSI) by 0.06% in the second month and followed by INF by 0.02 in the second month. However, the contribution of LOG(NAV) continues to decline every month. It is inversely proportional to the LOG(ICP), LOG(ISSI), and INF variables which continue to increase every month.

The INF VD analysis shows that the largest contributing variable is itself in the first month at 99.96%, followed by LOG(NAV) which contributed 0.04% in the first month, LOG(ISSI) at 0.92% in the second

month, and finally LOG(ICP) at 0.1% in the second month. However, the contribution of INF every month continues to decline, best compared to the variables LOG(NAV), LOG(ISSI), and LOG(ICP) which continue to increase every month.

The VD LOG(ICP) analysis shows that the variable that is suspected to have the highest influence on LOG(ICP) in the 120 months ahead is LOG(ICP) itself with a contribution in the first month of 99.84%, followed by INF by 0.14% in the first month and followed by LOG(NAV) by 0.015% in the first month. However, the contribution of LOG(ICP) continues to decline every month. In contrast to the INF, LOG(NAV), and LOG(ISSI) variables which continue to increase every month.

VD LOG(ISSI) analysis shows that the variable that is suspected to have the highest influence on LOG(ISSI) in the next 120-month period is LOG(ISSI) itself with a contribution in the first month of 80.88%, followed by LOG(ICP) of 13.66% in the first month and followed by LOG(NAV) of 3.56% in the first month. However, the contribution of LOG(ISSI) fluctuates every month and continues to decline, this is followed by LOG(NAV) which also experiences a decline every month. This is inversely proportional to the LOG(ICP), and INF variables which continue to increase every month.

4. CONCLUSION

This study aims to examine the impact of inflation, Indonesia crude price, and Indonesia sharia stock index on the net asset value (NAV) of Islamic mutual funds throughout the period of January 2014 to December 2023, both in the short term and long term. The empirical findings from the VECM analysis demonstrate a significant and enduring positive relationship between inflation and both the Indonesian Sharia stock index and the net asset value (NAV) of Islamic mutual funds in Indonesia. There exists a persistent and adverse correlation between the price of Indonesian crude oil and the Net Asset Value (NAV) of Islamic mutual funds in Indonesia. The short-term VECM analysis indicates that there are no variables that have a significant impact on the Net Asset Value (NAV) of Islamic mutual funds. However, the Granger causality analysis reveals that there is no causal relationship, either unidirectional or bidirectional, between the variables.

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APPENDIX

Table1.StationarityTest

Variables	Probat level	Result	Variables	Probat1 st difference	Result
NAV	0.8229	Non-stationary	D(NAV)	0.0000	Stationary
INF	0.3477	Non-stationary	D(INF)	0.0000	Stationary
ICP	0.0174	Stationary	D(ICP)	0.0000	Stationary
ISSI	0.5309	Non-stationary	D(ISSI)	0.0000	Stationary

Table2.CointegrationTest(Trace)

Hypothesized No. of CE(s)	Eigenvalue	TraceStatistic	0.05 CriticalValue	Prob.
None*	0.461670	206.0251	47.85613	0.0000
Atmost1*	0.347222	133.5690	29.79707	0.0000
Atmost2*	0.327685	83.66643	15.49471	0.0000
Atmost3*	0.272447	37.21408	3.841465	0.0000

Table3.CointegrationTest(Max-EigenStatistic)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 CriticalValue	Prob.
None*	0.510470	83.55916	27.58434	0.0000
Atmost1*	0.360944	52.38829	21.13162	0.0000
Atmost2*	0.301437	41.97145	14.26460	0.0000
Atmost3*	0.296268	41.10884	3.841465	0.0000

Table4.GrangerCausalityTest

	Observation	F-Statistic	Prob.Value
INFdoesnotGrangerCauseNAV	119	0.52195	0.4715
NAVdoesnotGrangerCauseINF		1.60507	0.2077
ICPdoesnotGrangerCause NAV	119	0.49266	0.4841
NAVdoesnotGrangerCauseICP		0.30389	0.5825
ISSIdoesnotGrangerCause NAV	119	2.28222	0.1336
NAVdoesnotGrangerCauseISSI		0.18153	0.6708

Table5.VectorErrorCorrectionMethodLongRun

Description	Coefficient	Std.Error	T-Statistics
INF(-1)	1.819809	(0.41749)	[4.35893]
LOG(ICP(-1))	-6.423954	(1.45410)	[-4.41781]
LOG(ISSI(-1))	15.80050	(5.85101)	[2.70047]

Table6.ShortRunVectorErrorCorrectionModel

Description	Coefficient	Std.Error	T-Statistics
D(LOG(NAV(-1)))	0.012298	(0.09655)	[0.12738]
D(INF(-1))	-0.008472	(0.01597)	[-0.53044]
D(LOG(ICP(-1)))	0.013715	(0.03174)	[0.43206]
D(LOG(ISSI(-1)))	0.040878	(0.24568)	[0.16639]

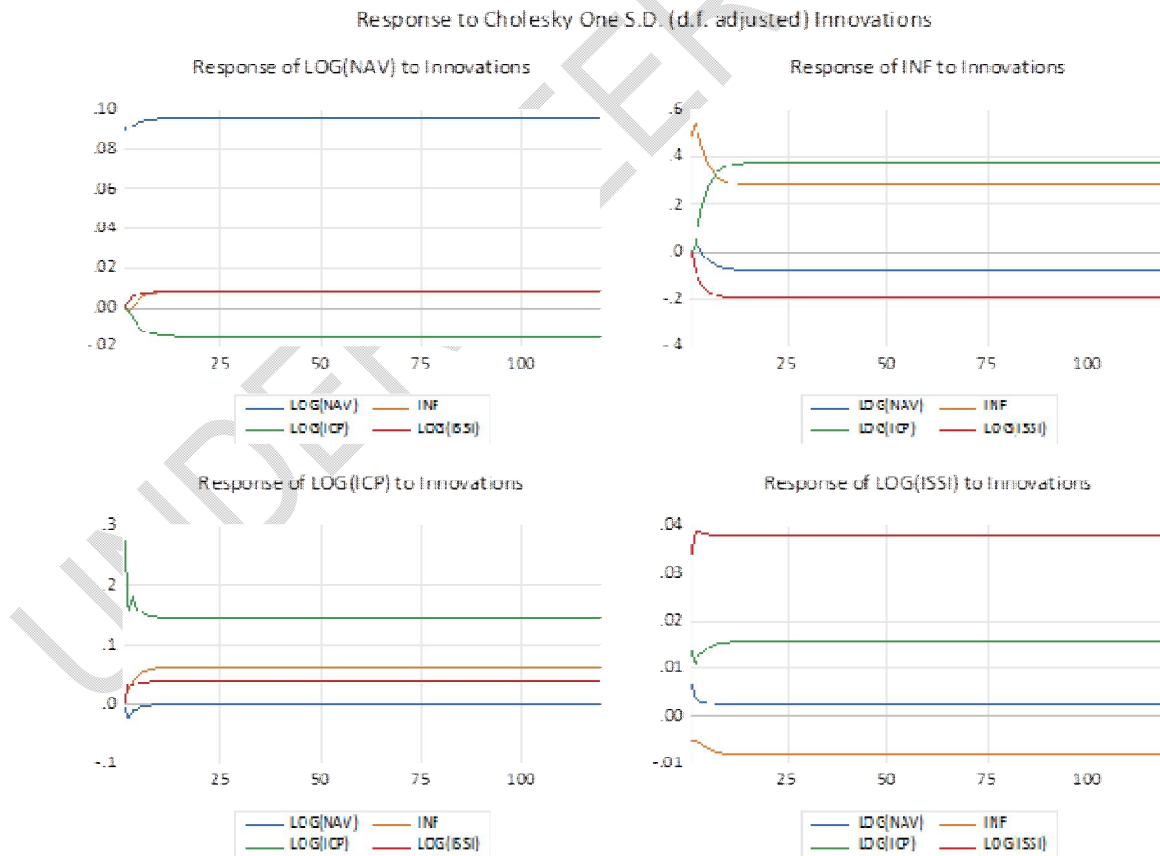


Figure1.ImpulseResponse

Variance Decomposition using Cholesky (d.f. adjusted) Factors

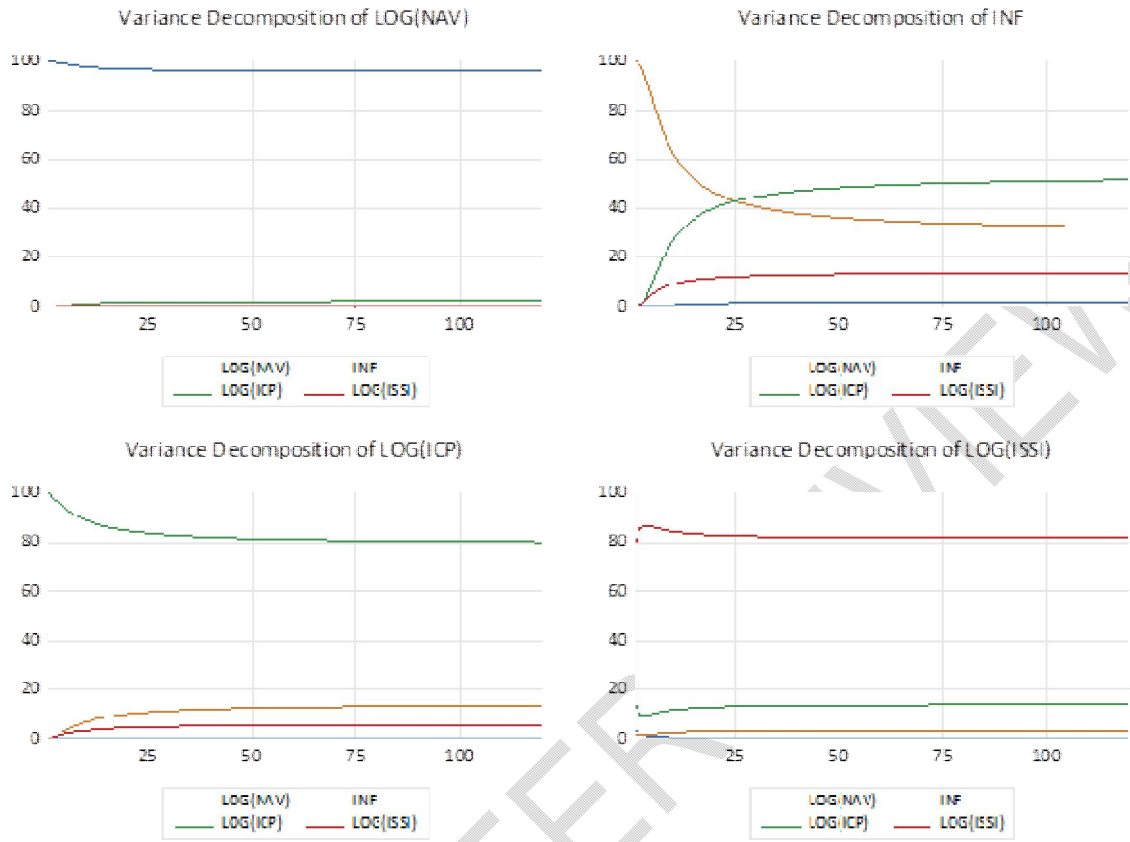


Figure2.Variance Decomposition