Can country risks predict Islamic stock index? Evidence from Indonesia

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Abstract

Purpose – This study aims to examine the relationship between the Indonesian Islamic capital market, the country's risk and macroeconomic factors.

Design/methodology/approach – This study uses the Johansen cointegration test and the vector error correction model (VECM) on monthly data from January 2003 to March 2016 to examine the variables that influenced the Islamic capital market proxied by the Jakarta Islamic Index (JII).

Findings – The findings indicate the existence of short-term and long-term cointegrations between country risk (political, economic and financial risks), macroeconomic variables (industrial production index, inflation and oil price) and JII. In the long run, financial risk positively affects the JII, whereas economic risks and inflation are negatively related. In the short run, only inflation affect negatively the JII.

Practical implications – The study emphasizes the critical role of financial risk in affecting the Islamic capital market. Investors negatively respond to higher financial risk and react positively to more increased economic threats. The variable of financial risk has the highest coefficient, indicating that the investors favour a conducive financial environment in deriving JII.

Originality/value – This study extends the previous literature with an attempt to empirically examine the influence of Indonesia's country risk on the Islamic stock market through VECM.

Keywords Country risk, Vector error correction model, Islamic Capital market, Macroeconomic variables, Jakarta stock exchange Islamic index

Paper type Research paper

1. Introduction

As a country with the largest Muslim population, Indonesia is a considerable market for developing the Islamic financial industry. Despite the growing popularity in the Islamic capital market, there is limited research in this area. The increasing demand for Islamic investment and the potential of the largest Muslim population provide opportunities to develop Islamic investment and capital markets. The performance of the Islamic stock index, which is proxied by the Jakarta Islamic Index (JII) in Figure 1, shows an increasing trend. This proves the growing demand for Islamic investments by investors.

JII is one of the benchmarks to measure the performance of Islamic investment in stocks. This index is the oldest Islamic stock basis. It comprises 30 stocks constituents registered on the list of Sharia Securities that restrict stocks or investments that perform gambling, highly in debt, speculative actions, selling alcohols and other prohibited or unethical activities (Hakim and Rashidian, 2002; Huda and Edwin Nasution, 2008). It contains stocks with the level of liquidity and the largest average

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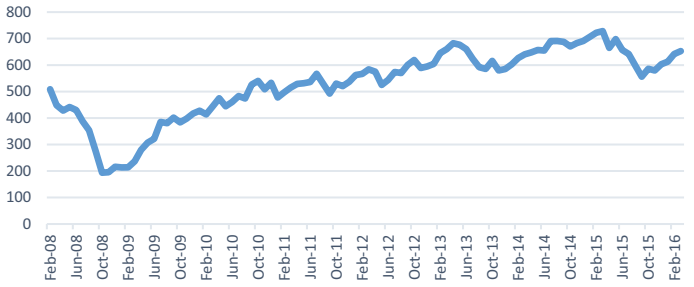

Source: Indonesia Stock Exchange

Figure 1.
JII movement

regular trade value during the past year (Darmadji and Fakhruddin, 2012). Various studies have used JII to expand the literature on Islamic stock investment (Wahyudi and Sani, 2014; Hanif, 2020; Qizam *et al.*, 2020).

Several factors such as foreign investor perceptions, significant differences in interest rates and macroeconomic stability drive the Indonesian capital market's performance. Despite a sluggish global economy, Indonesia's prospect of substantial economic growth has attracted foreign investors into the country. Looking closer, studies done to examine the interaction of stock prices and macroeconomic variables discovered different causalities between variables (Maysami and Koh, 2000; Ibrahim and Sulaiman, 2001; Hosseini *et al.*, 2011; Sakti and Harun, 2013; Naifar, 2016).

Consequently, this study examines the association between country risk and selected macroeconomic variables on the movement of the JII. This study aims to empirically determine the influence of Indonesia's country risk and selected macroeconomic variables on the Islamic stock market by using vector error correction model (VECM). This paper also investigates the presence of long-term relationships between JII, country risk (financial risk, political risk and economic risk) and selected macroeconomic variables, such as inflation, oil price and the Industrial Production Index (IPI).

The results of this study are essential for several reasons. The results confirm that the country's risk influences the Indonesian Islamic capital market, both in the short term and long term. The results provide the government with essential information to help establish a conducive economic environment to minimise the country's risk. The study offers insight to foreign investors and their consideration of a country's risk before investing, particularly in the Indonesian Islamic capital market.

The remainder of this article is structured as follows. Section 2 provides a short review of the related literature, whereas Section 3 describes the data and methodology used in the study. Section 4 shows empirical results and analysis, whereas Section 5 concludes the study and provides recommendations for policy implementations.

2. Literature review

2.1 Country risk assessment and its impact on Jakarta Islamic Index

Country risk is a concept that explains the likelihood of change in an economic and political landscape that most likely produce deviations over the expected returns of investments made in a particular country (Kara and Karabiyik, 2015). Conversely, risk measurement will help investors and financial institutions invest in a country with low risk, divesting in a

country with a growing threat and avoid investing in extreme risk countries. While Madura (2010) defines country risk as to the likelihood of negative influences of a country's economic, political and social environment changes on a business. The International Country Risk Guide (ICRG) provides risk indicators to help evaluate investment decisions, especially in international trades and businesses (Table 1).

Country risk rating and its components became a concern for investors, policymakers and international organisations, especially after the financial crisis. Erb *et al.* (1996) argued that political, financial and economic risk assessments are good proxies in explaining stock returns. Changes in political ratings hold some marginal explanatory power in emerging equity markets but not in developed markets.

Kabir Hassan *et al.* (2003) found that the country risk determined the volume and predictability of ten stock markets in the Middle East and Africa. Hammoudeh *et al.* (2013) investigated the country risk and stock market of Brazil, Russia, India, China and South Africa economic bloc and discovered that only China's stock market is sensitive to all country risk, especially financial risk.

Sari *et al.* (2013) found evidence of a long-term relationship between Turkey's country risk and the stock market movements, whereas political and financial risks are less likely to affect the Turkish stock markets in the short term. Mensi *et al.* (2017) found that financial risk had a positive relationship with the Gulf Cooperation Council (GCC) stock's performance market.

Trabelsi Mnif (2017) found that political risk generates volatile financial markets and more pronounced stock market cycles. The political instability caused by the Tunisian revolution shock led to a deviation of the stock cycle trend from its original track. Furthermore, the probability of war and political unrest can affect stock returns in developed, developing and under-developed markets (Amihud and Wohl, 2004; Dimic *et al.*, 2015).

2.2 Impact of macroeconomic factors on Jakarta Islamic Index

The impacts of macroeconomic factors on the performance of the stock market have been thoroughly studied. Raza *et al.* (2016) investigated the gold price, oil price and volume in stock markets in ten countries (China, India, Brazil, Russia, South Africa, Mexico, Malaysia, Thailand, Chile and Indonesia) and discovered that the price of oil affects negatively on the stock markets of developing countries. Smyth and Narayan (2018) observed that oil is the

Risk	Risk Components
Political Risk	Government Stability, Socioeconomic Conditions, Investment Profile, Internal Conflict, External Conflict, Corruption, Military in Politics, Religious Tensions, Law and Order, Ethnic Tensions, Democratic Accountability, and Quality of Government Bureaucracy
Economic Risk	Gross Domestic Product (GDP) per capita, Real GDP Growth, Annual Inflation Rate, Government Budget Balance as a Percentage of GDP, and the balance of Current Account as a Percentage of GDP
Financial Risk	Foreign Debt as a Percentage of GDP, Foreign Debt Service as a Percentage of Exports of Goods and Services, Current Account as a Percentage of Exports of Goods and Services, Net International Liquidity as Months of Import Cover, Exchange Rate Stability

Source: ICRG (2016)

Table 1.
Country risk determinants

primary input of production for most industries, where higher oil prices raise the production cost, lowering the firm's expected cash flows, decreasing earnings and dividends, thus lowering stock returns. Studies carried out to examine the impact of oil price on the stock markets of Greece and Vietnam showed a similar trend where an oil price shock resulted in negative stock returns (Narayan and Narayan, 2010; Roubaud and Arouri, 2018).

Looking closer into the impacts of oil prices in Southeast Asian countries on the Islamic stock index, findings of Abdullah *et al.*(2016) show that the Malaysian Initial Sampling Inspection Report (ISIR) is the second least associated with the volatility of crude oil prices. Even though the return of Philippine ISIR is the least correlated with crude oil price return, however, the highly volatile index offsets its benefit as a diversification portfolio. Badeeb and Lean (2018) inferred a weak relationship between an oil price change and the Islamic composite index, as it follows a nonlinear pattern in a more extended period. In a shorter period, the Islamic index reacts positively to oil prices changes, whereas the Islamic index reacts adversely to oil price changes in the long run. This shows that Islamic stocks have benefited from falling oil prices. Ftiti and Hadhri (2019) suggested that oil risk and return should be accounted for in formulating the performance indicators for investment and asset allocation. Investors should invest in stocks that have a high positive correlation with oil prices while responding fast to a decrease in oil price.

The association between stock prices and their expected returns to inflation can be positively and negatively correlated. Fama (1981) and Asprem (1989) studied inflation's relationship to stock returns, which showed an adverse and robust correlation between inflation and stock price and returns. Antonakakis *et al.* (2017) found the correlations between inflation and stock market returns in the United States are evolving heterogeneously overtime. The correlations are significantly positive in the 1840s, 1860s, 1930s and 2011 and significantly negative otherwise. The relationship between these variables is time-varying and could result in either positive or negative correlations.

Lee (2010) found evidence that there was a negative relationship between inflation and stock returns during the post-war period while there was a positive relationship during the pre-war period. Furthermore, Oxman (2012) used data from 1966 to 2009 and separated the sample into two periods, i.e. 1966–1983 and 1984–2009 and observed that there was a rapid price increase in the 1970s that was moderated significantly after the early 1980s but did not appear to have any effect after 1983. Naifar (2016) examines whether global risk factors and macroeconomic conditions influence global Islamic index with a quantile regression approach. The result shows no impacts for the lower quantiles, while positive and significant correlations of the inflation exist only for the intermediate and upper quantiles. Tiwari *et al.* (2015) found that the expected stock returns in Pakistan, in the long run, does not erode with inflation. The study argues that Pakistan's stock market could function as a hedge against inflation, at least in the long run.

Sukmana (2017) investigate the influence of macroeconomic indicators to equity markets (both Islamic and conventional Indices) in Indonesia as an emerging market. The result suggests that both indices share their long-run movement among the variables. IPI and CPI seem to be following the theory by indicating positive effects on JKSE and JII. Similar result was also arrived by Hussainey and Khan Ngoc (2009) found that real-sector production strongly influences stock prices in the Vietnamese stock markets. Tiwari *et al.* (2015) indicated that the expected stock returns in Pakistan, in the long run, did not erode with inflation. The study argues that Pakistan's stock market could function as a hedge against inflation, especially in the long run.

3. Data and methodology

3.1 Variables and data sources

This study examined the impact of Indonesia's country risk (economic, financial and political risks) and macroeconomic variables, which consisted of oil prices, inflation, IPI on the JII from January 2003 to March 2016. Monthly secondary time series data of JII were obtained from Yahoo Finance, the oil prices, inflation and IPI were obtained from Indonesian Statistics (*Badan Pusat Statistik*) and the determinants of country risk were obtained from the ICRG published by the PRS Group (Table 2).

The compilation of political, economic and financial risks created a single composite country risk indicator, which ranged from 0 to 100. A higher score of the composite country risk indicates that the specific country is exposed to a low level of risks and vice versa (ICRG Methodology, 2016). The political risk has a weightage of 50%, whereas both economic and financial risks weigh 25% for each.

3.2 Estimating model

This study employed the vector autoregression (VAR) analysis, which combined the error correction model's integration and the VECM method. This study identified the integration order for all variables by applying the Augmented Dickey–Fuller Test (ADF) and the Unit Root Test introduced by David Dickey and Wayne Fuller. The cointegration test was used to determine the cointegration of variables, according to Widarjono (2017). After detecting a cointegration relationship between variables, long-term and short-term dynamics, relationships between variables were analysed using VECM.

VECM was used to analyse seven long-term and short-term relationships between the independent and dependent variables in time series data and explored each variable's responses and contributions. The estimating cointegration model of JII was formulated through the following equations. Equation (1) shows the cointegration model, whereas equation (2) shows the VECM model:

$$\ln \mathrm{JII}_t = \alpha_0 + \alpha_1\ \mathrm{FR}_t + \alpha_2\ \mathrm{OIL}_t + \alpha_3\ \mathrm{PR}_t + \alpha_4\ \mathrm{INF}_t + \alpha_5\ \mathrm{IPI}_t + \alpha_6\ \mathrm{ER}_t + \varepsilon_t \tag{1}$$

$$\begin{aligned}\Delta JIIi_t = {} & \alpha_1 + \sum_{\rho}^{i=1} \beta_{1i} \Delta JIIi_{t-1} + \sum_{\rho}^{i=1} \beta_{1i} \Delta \mathrm{FR}_{t-i} + \sum_{\rho}^{i=1} \beta_{1i} \Delta \mathrm{OIL}_{t-i} \\ & + \sum_{\rho}^{i=1} \beta_{1i} \Delta \mathrm{PR}_{t-i} + \sum_{\rho}^{i=1} \beta_{1i} \Delta INF_{t-1} + \sum_{\rho}^{i=1} \beta_{1i} \Delta \mathrm{IPI}_{t-i} + \sum_{\rho}^{i=1} \beta_{1i} \Delta \mathrm{ER}_{t-i} \\ & + \varphi_1 ECT_{t-1} + \mu_{1i}\end{aligned} \tag{2}$$

Level of Risk	Composite Risk	Political Risk	Economic and Financial Risks
Weightage	100%	50%	25% for each
Very High Risk	0.00 to 49.9 points		0.00 to 24.5 points
High Risk	50.0 to 59.9 points		25.0 to 29.9 points
Moderate Risk	60.0 to 69.9 points		30.0 to 34.9 points
Low Risk	70.0 to 79.9 points		35.0 to 39.9 points
Very Low Risk	80.0 to 100 points		40.0 to 50 points

Source: ICRG (2016) Methodology

Table 2. ICRG Risk assessment

where:

μ_{1i} = Random Errors;
ECT_{t-1} = Integrating Vectors;
φ = Adjustment coefficient for disequilibrium in last year;
α = speed Adjustment coefficient regarding the long – run correction term; and
β = individual variables′ coefficient ∈ in the error correction term.

JII: Jakarta Islamic Index;
FR: Financial Risk;
OIL: Oil Price;
PR: Political Risk;
INF: Inflation;
IPI: Industrial Production Index;
ER: Economic Risk; and
EXRT: Exchange Rate, and e: error term.

In this model, all variables must be endogenous, so the total equation must equal the number of variables. Therefore, the dependent variable depends on the delay of the independent and dependent variables, the ECM and the random error term in the respective equations. Error correction indicates the speed of adjustment to restore the balance of the model. The ECM coefficient suggests how quickly the variable can return to equilibrium. The ECM coefficient must be significant and negative.

For robustness purpose, we change replace inflation in the equations (1) and (2) with another macroeconomic variable, which is exchange rate as seen in equations (3) and (4). The replacement is conducted to check the consistency of country risk by the change in macroeconomic conditions. Model 3 shows cointegration for the robust model, and Model 4 shows the VECM model:

$$\ln \mathrm{JII}_t = \alpha_0 + \alpha_1\ \mathrm{FR}_t + \alpha_2\ \mathrm{OIL}_t + \alpha_3\ \mathrm{PR}_t + \alpha_4\ \mathrm{EXRT}_t + \alpha_5\ \mathrm{IPI}_t + \alpha_6\ \mathrm{ER}_t + \varepsilon_t \tag{3}$$

$$\begin{aligned}\Delta JIIi_t = {} & \alpha_1 + \sum_{\rho}^{i=1} \beta_{1i} \Delta JIIi_{t-1} + \sum_{\rho}^{i=1} \beta_{1i} \Delta \mathrm{FR}_{t-i} + \sum_{\rho}^{i=1} \beta_{1i} \Delta \mathrm{OIL}_{t-i} \\ & + \sum_{\rho}^{i=1} \beta_{1i} \Delta \mathrm{PR}_{t-i} + \sum_{\rho}^{i=1} \beta_{1i} \Delta EXRT_{t-1} + \sum_{\rho}^{i=1} \beta_{1i} \Delta \mathrm{IPI}_{t-i} + \sum_{\rho}^{i=1} \beta_{1i} \Delta \mathrm{ER}_{t-i} \\ & + \varphi_1 ECT_{t-1} + \mu_{1i}\end{aligned} \tag{4}$$

4. Result and analysis

4.1 Preliminary analysis

The first preliminary analysis consists of is the stationary test, the stability test and the optimum lag test. The stationary test aims to determine the stationery level of each variable by using the ADF procedure. The results are presented in Table 3 as follows.

The results of the stationary test at the level indicate that all variables were not stationary as the absolute value of *t*-ADF (−1.943) was smaller than the critical value at 5% level. Research with data that was not statistically stationary could result in spurious regression; thus, the stationarity test was continued at the level of the first difference.

The VAR and VECM models are stated to be stable if all coefficients are less than 1. VAR stability test was used to calculate the roots of the polynomial function. The stationary modulus is smaller than one and were located within the unit circle, so that the VAR model is considered valid, see Table 4.

The optimal lag was determined to eliminate autocorrelation and was shown in Table 5. Based on the calculation of the Akaike Information Criterion (AIC), the optimal lag was at one.

4.3 Cointegration test

In the VAR/VECM analysis, a cointegration test must be carried out to determine and ensure the existence of long-term cointegration, by using Johansen cointegration. If these variables are found to be cointegrated, the study will continue to apply the VECM. The results were summarised in Table 6.

The results show the existence of long run cointegration at a 5% confidence level as the values of trace statistics were higher than the critical value. Thus, the VECM model is applied for this study.

	At Level		At First Different	
Variable	ADF Value	Explanation	ADF Value	Explanation
JII	1.776	Nonstationary	−9.507	Stationary
Financial risk	0.449	Nonstationary	−12.798	Stationary
OIL	−0.130	Nonstationary	−8.770	Stationary
Political risk	0.578	Nonstationary	−12.707	Stationary
Inflation	−0.808	Nonstationary	−9.307	Stationary
IPI	0.356	Nonstationary	−17.397	Stationary
Economic Risk	0.129	Nonstationary	−12.490	Stationary

Table 3.
Stationary test result

Source: Authors' calculation

Root	Modulus
0.929 + 0.206i	0.951
0.929 – 0.206i	0.951
0.672 + 0.635i	0.924
0.672 – 0.635i	0.924
−0.812 + 0.439i	0.923
−0.812 – 0.439i	0.923
0.814 + 0.424i	0.918
0.814 – 0.424i	0.918
−0.187 – 0.899i	0.918
−0.187 + 0.899i	0.918
0.739 – 0.536i	0.912
0.739 + 0.536i	0.912

Table 4.
VAR Stability test

Source: Authors' calculation

4.4 Vector error correction model

VECM is applied to examine the short and long-term dynamics between the variables and the relationships were shown in Tables 7 and 8.

In Model I, there is a deviation and is corrected to 0.035. This is a speed adjustment to return to equilibrium. VECM estimates show that inflation negatively affects JII, which indicates an increase in inflation of one percent will decrease JII by 0.079. Some variables do not play an essential role in the short run because of the time it takes (lag) for the variables to react to other variables. These results prove the existence of an adjustment mechanism from short run to long run, which is indicated by a significant and negative cointegration error. VECM estimation in the long run finds that financial risk has a positive effect on JII of 8.821, while the variable that shows a negative relationship is economic risk of −10.271. Inflation has a negative impact at the 10% significance level.

In Model 2, there is a deviation from the long run and is corrected by 0.071. This is a speed adjustment to return to balance. Both Models 1 and 2 show robust results. In the long term, it shows that financial risk has a significant positive effect of 6.406, while the economic risk

Lag	AIC
0	−25.114
1	−25.3445*
2	−25.075
3	−25.042

Note: *Indicates lag optimal
Source: Authors' calculation

Table 5.
Var stability test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.257	134.462	125.615	0.013
At most 1	0.162	88.084	95.754	0.150
At most 2	0.148	60.604	69.819	0.217

Note: Trace test indicates one (1) cointegrating equation at the 0.05 level
Source: Authors' calculation

Table 6.
Cointegration test

	Long-Term Model I (Main Model)		Long-Term Model II	
Variable	Coefficient	T-statistics	Coefficient	T-statistics
LN Political Risk (−1)	−0.284539	0.61805	0.907215	1.35892
LN Financial Risk (−1)	8.821262	5.57268***	6.406036	6.36577***
LN Economic Risk (−1)	−10.27081	−5.24511***	−4.90522	−3.29118***
LN Oil Price (−1)	0.300156	−1.18222	0.312287	1.99095
LN IPI (−1)	−0.284539	0.61805	−2.117643	−4.19821***
LN Inflation (−1)	−0.284539	1.95345*		
LN Exchange Rate (−1)			1.997568	5.21634***

Table 7.
Long-term cointegration

Variable	Model I Coefficient	T-Statistics	Model II Coefficient	T-Statistics
CointEq1	−0.035	−2.506**	−0.071	−3.227***
D LN JII (−1)	0.187	2.314	0.317	3.33***
D LN JII (−2)			0.141	1.345
D LN Political Risk (−1)	−0.450	−1.042	−0.888	−1.927
D LN Political Risk (−2)			0.455	1.039
D LN Financial Risk (−1)	−0.165	−0.634	−0.012	−0.045
D LN Financial Risk (−2)			−0.0301	−0.117
D LN Economic Risk (−1)	−0.018	−0.050	0.086	0.228
D LN Economic Risk (−2)			0.068	0.184
D LN Oil Price (−1)	0.0730	1.213	0.115	1.717
D LN Oil Price (−2)			0.0120	0.185
D LN Exchange Rate (−1)			0.369	1.596
D LN Exchange Rate (−2)			0.367	1.517
D LN IPI (−1)	0.046	0.464	−0.015	−0.136
D LN IPI (−2)			−0.202	−1.904
D LN Inflation (−1)	−0.079	−2.135**		

Table 8.
Short-term effects

shows a significant negative impact of −4.905. Financial and economic risks are consequential in Models I and II. Other macroeconomic variables, IPI has a significant negative effect of −2.117643, and the exchange rate has a significant positive impact of 1.997568.

4.5 Analysis

The VECM model results indicate that financial risk positively affects the JII movement in the long run and are relevant variables used to predict the performance of the Islamic stock market. This result is corroborated by the studies done by Sari *et al.* (2013), Clark and Kassimatis (2004) and Kara and Karabiyik (2015), which found that an increase in financial risk harms stock returns. Foreign investors should take the country risk and the long-term financial stability of a country into consideration before investing (Amihud and Wohl, 2004; Trabelsi Mnif, (2017); Vortelinos and Saha, 2016). Various factors such as foreign debt levels, foreign debt services, current account balances, net international liquidity and exchange rate must be considered when determining the financial stability of a country.

The positive impacts of financial risk on stock prices can be seen from Indonesia's financial risk assessment indicators, where Indonesia's debt-to-GDP ratios experienced improvement during the observation period. Indonesian Government debt is still relatively small compared to many countries where public debt is limited to 60% of the GDP (State Finance Law No. 17/2003). Indonesia's debt-to-GDP ratio in March 2016 was only 36.47%, whereas other countries such as Japan had a debt-to-GDP ratio of 250%, Greece (176.90%), Lebanon (139 %), Brazil (74 %) and Argentina (57.10%). According to the Maastricht Treaty, foreign external debt is safe if the debt-to-GDP ratio is below 33%; however, if the rate is 33%–60%, the government must consider its debt. A country is in critical condition if the debt-to-GDP ratio exceeds 60%. Indonesia's foreign debt-to-GDP ratio was still at a conservative level from 2004 to 2013; the debt-to-export ratio declined relatively below the standard rate of 125%, despite an increase in 2014–2016. Indonesia's debt-to export ratio has improved during the observation period, consequently improving the country's financial risk premium. This financial risk premium will positively impact the development of Islamic capital markets; an increase in investment in the Islamic capital market will raise sharia stock prices, causing the JII index to increase.

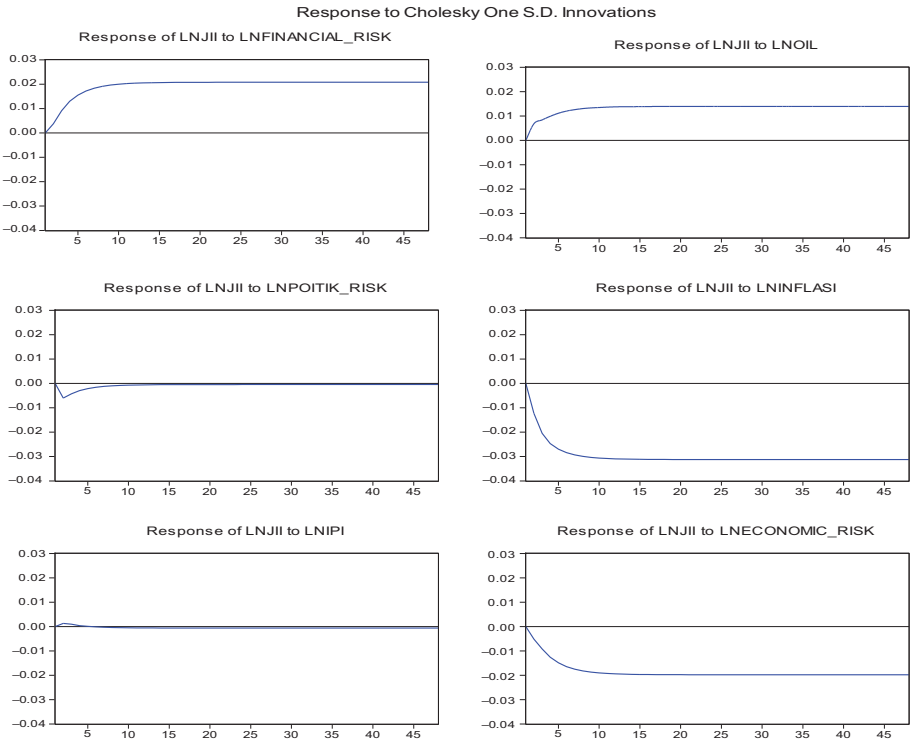

Figure 2.
Impulse response function

Based on the study, it can be inferred that higher economic risk is responded positively by the investor to invest in JII. This nexus is robust and further supported studies of Kabir Hassan *et al.* (2003), Mateus (2004) and Kara and Karabiyik (2015), who found that a country's economic risk significantly determines stock volatility and predictability. However, this result differs from the mainstream paradigm of higher risk, which will reduce investor motivation (Kiymaz, 2009; Madura, 2010). The economic risk affects negatively to the JII. This means that higher economic risks are responded by higher activity of investment in JII. This opposes the general theorem of risk, as stated by Madura (2010) where investors avoid investment in countries or indexes with high exposure of risks. Lusyana and Sherif (2017) found that performance of Indonesian Islamic stocks is better than conventional stocks, seen from the performance of the Sharpe and Treynor Black Appraisal ratios. As Islamic stocks are overperforming the conventional stocks market, investor put their investment in Islamic stocks despite economic crisis.

According to Ardana (2016), the past decade showed several economic crises that shook the world, such as the subprime mortgage crisis in 2008 and the European debt crisis in 2010. The crises rocked the banking industries and financial sectors in America and extended to Europe and Asia. Research conducted by Wardana *et al.* (2011) show that although the US financial crisis affects the Islamic capital market, the impact of the crisis is more extended in the conventional capital market. The Islamic capital market has proven to better adapt to changes from external crisis disturbances. Thus, it is concluded that the

Islamic capital market has more resistance to crises than the conventional one. Hkiri *et al.* (2017) found that the global financial crisis significantly affected the volatility of the Islamic and conventional stock markets. However, the findings suggest that Islamic indices can be used as a hedge or haven for investors during financial crises.

Qizam *et al.* (2020) found similar results. Despite the global financial crisis in 2008, the JII became the strongest among markets in ASEAN-5 countries and showed a positive movement in line with the post-crisis recovery period. This is because the Islamic capital carries out Islamic sharia principles in its business activities. The five principles of Islamic finance (Boukhatem and Ben Moussa, 2018) are as follows:

(1) Prohibiting usury (interest).

(2) Prohibition of *gharar* (fraudulent or malicious transactions) and *maysir* (acquisition of wealth by chance).

(3) Tangible assets back all funding and financing activities.

(4) Investment restrictions for non-halal activities.

(5) The application of profit and loss sharing.

In addition, the sharia advisory board will conduct regular qualitative and quantitative screenings on each company to determine the company's classification as a sharia-compliant share. Islamic finance is proved to be the ideal method of financial intermediation for many companies since the providers of funds also participate in the profit and loss of a project (Mohd. Yusof and Bahlous, 2013). This is in line with theoretical and empirical studies. For example, theoretically, Hasan and Dridi (2011) stated that the integration of the Islamic legal framework in Islamic finance had increased economic productivity.

Long-term estimates show that inflation harms the JII. These results support studies by Fama (1981), Asprem (1989), Lee (2010) and Antonakakis *et al.* (2017), which found a significant and negative correlation between inflation and stock prices, where higher rates of inflation will reduce the investment activities for the JII and diminish the purchasing power. Inflation will increase the operational cost of a company leading to a decline in company profitability. The decreasing dividends will reduce investors' motivation to invest in the capital market, preferring to invest in the money market and reducing their investment in the Islamic capital market.

Historically, the inflation volatility in Indonesia's was higher than in other developing countries, where the average annual inflation rate in Indonesia was around 8.5%, and other countries experienced inflation rates of between 3% and 5% per year during 2005–2014. It was only since the beginning of 2015 that the inflation rate in Indonesia is slowly being controlled.

Investors pay no attention to the political risk determinants before allocating their capital to invest in JII shares. This result contradicts studies done by Madura (2010), Kara and Karabiyik (2015), Amihud and Wohl (2004) and Vortelinos and Saha (2016), which state that political risk affects the stock indices. Studies carried out in Taiwan highlighted that political unrest played an essential role in the stock market volatility (Huang *et al.* (2011). Dimic *et al.* (2015) determined that political risk factors affected the stock returns in developing and advanced economies.

The oil price has an insignificant effect on the JII. Although oil-producing companies do not dominate companies listed in the JII, investors are motivated to invest their money in oil sectors and commodities when the oil price is favourable. The increase in world oil price and stability will increase corporate revenues, grow its stock price and instantly affect the stock index. However, the rise in oil prices will depress stocks with specific characteristics, namely companies that rely on importing most of their raw materials. These findings contradict

studies that indicate oil prices significantly affect stock returns (Huang *et al.*, 2011; Roubaud and Arouri, 2018). The results also determined that the production index and IPI do not influence the JII. These results differ from countries like Vietnam (Hussainy and Ngoc, 2009), Japan (Mukherjee and Naka, 1995), Malaysia (Hussin *et al.*, 2012), Singapore (Maysami and Koh, 2000) and Indonesia (Sukmana, 2017).

4.6 Impulse response function

The results of the impulse response function of the financial risk variable indicate that the movement is stable and positive towards JII in the 13th month, while world oil prices also show a positive direction towards JII in the 8th month. Political risk, economic risk, inflation, and IPI show adverse movements towards JII at different times; month 15th, month 9th and month 10th, respectively.

5. Conclusions and recommendations

This study explored the short-term and long-term connections between the JII and the macroeconomic variables based on monthly data from January 2003 to March 2016. In the short term, only the inflation rate affected the JII while country risk, oil prices and the industrial production indexes did not affect the JII. This result shows that investors are concerned about inflation when investing for the short-term, and the government should try to maintain inflation stability to increase investor motivation. The impulse response indicates that the JII positively responds to shocks that occur from financial risk, oil prices, and industrial production index, while negatively respond to shocks that occur for economic risks, political risks and inflation.

The country's financial risk positively affects the stock price movements in the long run, but the economic risk can harm it. The government must ensure a conducive investment environment by always maintaining the country's finances appropriately.

Based on a risk perspective, rational investors should consider risk exposure and avoid investing in countries with extreme risk. Moreover, investors negatively respond higher financial risk while positively respond higher economic risks. Further research should study other macroeconomic variables such as GDP and interest rate and carry out causality tests to determine the conformity of these macroeconomic variables on the JII.

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