Integration of the Indonesian Islamic Stock Index: Evidence from Developed and Developing Countries

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Abstract

Economic and monetary systems all over the world are increasingly becoming intertwined as a result of globalization. In addition, investors in the Islamic stock market may experience a decrease in the benefits of diversification because of shocks produced by globalization. This research aims to examine how the Indonesian Islamic stock index relates to the other Islamic stock indices from developed and developing countries. Data collected daily from 2012-2021, totaling 2088 observations, using a vector error correction model show that the Islamic stock index in Indonesia is linked to the Islamic stock index in both developed and developing countries. In addition, the Indonesian Islamic stock index had mixed reactions to both established and emerging Islamic stock indices. The Islamic stock indices in Indonesia are primarily affected by Japan's involvement. Indonesia's Islamic stock indices must prepare various alternative strategies for dealing with shocks from the Islamic stock indices in both developed and developing countries.

Keywords: *Market Integration, Developed Countries, Developing Countries, Islamic Stock*

INTRODUCTION

The development of the capital market is a leading indicator of economic growth, as shown by the experiences of a significant number of countries (Zulkhibri, 2018). Economic integration in the international capital market is one of the initiatives taken, and it can give a bird's-eye view of market operations. The capital market plays an important role in the Islamic finance industry, both in terms of roles and functions and in terms of market share (Salman & Nawaz, 2018).

Islamic investment explores the purported performance compared to socially responsible investments and the extent to which Islamic legal objectives are practically met by Islamic financial institutions (Yesuf & Aassouli, 2020; Zafar & Sulaiman, 2019). This can possibly play an essential role since assets in Islamic finance have a close relationship between the fundamental and financial sectors; this may influence the Islamic financial market due to the effects of volatility from other countries markets. Islamic stock prices include companies characterized by small leverage ratios and interest involvement which implies a relationship related to information flow and shock transmission (Ferris *et al.*, 2018; Saiti *et al.*, 2014). In other words, Islamic financial intermediaries play an important role because they reduce the transmission of shocks and reduce potential losses due to unexpected financial crises (Djennas, 2016).

Integration in the stock market is a relationship among global stock markets due to investors' unlimited access. It influences the achievement of global stock prices. The stock price reflects the expectations of investors in the context of the potential downsides. To that end, international investors tend to invest in areas where the economy is more conducive to liquidity, high stock, and low cost. This situation increases the degree of integration of the international stock market due to investors diversifying shares.

According to Stoupos and Kiohos (2021), on market integration, the Euro Area suffers various financial and economic asymmetries as a result of other economic engagement in trade unions. Using data from the stock markets of fourteen European nations and the monetary drivers in those countries, Lee and Kim (2020) examine the stock market's changing interconnectedness across time in relation to two occurrences. Financial integration between the stock markets of ASEAN5, plus China, Japan, and South Korea (referred to as ASEAN5+4), is a topic that Wu (2019) investigates. According to Aladesanmi *et al.* (2019), the effect of macroeconomic factors on stock market integration is studied. Mohti *et al.* (2019) evaluate the level of regional and global integration of stock markets in developing and developed Asian countries. In addition, Batten *et al.* (2019) examine the interconnectedness of oil, coal, and gas investments with Asia's ten largest stock markets.

The policy implications of this study for international investors and market participants in developing and developed countries make this research so interesting and valuable. In fact, the low correlation and zero shock transmission in the Islamic stock market will encourage investors in other international financial markets to better reorganize their portfolios to take advantage of risk diversification. This research makes an effort to shed light on these questions by adding to the scant body of evidence on diversification in the Islamic stock market.

This research aims to examine the long-term and short-term relationships between the Islamic stock markets of developed and developing countries and the Islamic stock market in Indonesia. Also, it examines how the Indonesian Islamic stock market has responded to shocks in the Islamic stock markets of developed countries and how much each Islamic stock market in developed countries has contributed to the Indonesian Islamic stock market. The findings of this research make essential contributions to a number of perspectives by, first, providing an overview of the current state of the Islamic stock market in both developing and developed countries. Second, regarding the integration of the Islamic stock market, the decision-making processes from both developing and developed countries should be taken into account. Third, figuring out how your money is spread out helps lessen the blow of any one setback.

LITERATURE REVIEW

When economic globalization takes place, it compels countries to strengthen their economies in order to maintain stability. If the economy is weak, a sudden change could trigger a crisis that spreads to other countries in the same situation, like a domino effect (BenSaïda *et al.,* 2018; Cieslak & Schrimpf, 2019; Werner, 2016). The integration that emerges between countries as a result of globalization causes a domino effect, which is mostly triggered when issues arise in countries that are categorized as essential or significant in specific sectors (Balli *et al.,* 2019; Casu & Girardone, 2010; Jebran *et al.,* 2017).

Excessive exposure to inaccurate market data is a distinct phenomenon from exposure to accurate data. In the case of a downturn in one market, the other market will also decrease due to their increasing connection. For this reason, it is increasingly becoming challenging to diversify across international stock markets, and there is a considerable risk of losing the gains altogether as the correlation between markets in different countries increases when the market receives a shock (Ellington, 2018; Lee & Goh, 2016; Sarwar *et al.,* 2020).

In a perfect market, all assets would be exposed to the same amount of risk, leading to uniform expected returns across the board (Balli *et al.,* 2019; Singh & Singh, 2016). Integration between stock markets shows efficiency, and these markets do not benefit from diversification because market performance tends to be the same across markets (Kim *et al.,* 2015; Silvers, 2021). In a risk-return framework, an investor can increase returns, reduce risk, or both by owning a combination of investments in the stock market with uncorrelated

returns. Thus, the degree of integration of the stock market indicates the potential benefits of portfolio diversification that investors can obtain.

According to Stoupos and Kiohos (2021), the continued involvement of economies in trade unions has resulted in a wide variety of financial and economic asymmetries in the Euro area. Regarding the Eurozone's economy, one of the most important tasks for policymakers is ensuring the region's long-term financial integration. The findings show that stock market integration is high in the case of Germany and the central members of the euro area but is different for the countries on the Euro zone's periphery. However, the DAX-30 has only seen hints of integration with the eastern Mediterranean and Baltic stock markets.

The introduction of the Euro in 1999 and the banking crisis of 2011 are two contrasting events that Lee and Kim (2020) use to examine the changing degree of integration between stock markets in fourteen European countries and their relevant monetary drivers over time. The panel analysis shows that after the European monetary union, the integration of the stock market in the European Union was primarily driven by the convergence of economic performance, the reduction in interest rate differentials, and inflation among the European Union countries. According to qualitative research, GDP disparities among EU member states have been found to have a negative correlation with economic convergence.

Financial integration between the stock markets of ASEAN5, plus China, Japan, and South Korea, is a topic investigated by Wu (2019). Results from applying a rolling window approach informed by graph theory and Vector Autoregressive (VAR) based methods reveal a high degree of interdependence but unpredictable temporal patterns between these markets. Similar global factors are found to be behind much of this high degree of integration. The correlation weakens significantly if these variables are removed from each stock market. As a result, the stock market in East and Southeast Asia is not as integrated as it may seem. Although regional governments have encouraged cooperation and integration of financial markets, substantial obstacles persist. These inflated correlations are a reflection of the more significant global influence on individual markets, while correlations due to factors other than global ones have been decreasing since the crisis.

From 1935 to 2015, Aladesanmi *et al.* (2019) examined the effects of macroeconomic determinants like financial convergence and volatility on stock market integration. It also assesses the degree to which the UK and US stock markets were intertwined before, during, and after Bretton Woods (BW) under three distinct monetary regimes. Weak integration is observed

during the BW regime, while strong integration is observed during the post-BW regime. Since the BW system's collapse, additional research shows that macroeconomic convergence, financial volatility, and the crisis have been the primary drivers of stock market integration between the two markets.

The degree of regional and global integration of emerging and leading Asian stock markets is evaluated by Mohti *et al.* (2019). The Detrended Cross-Correlation coefficient and the Gregory and Hansen cointegration test were used to examine the long-term relationship between the markets. According to the empirical study's findings, there are signs of global and regional integration in every emerging market studied. However, only Pakistan and Vietnam are included in this when it comes to the border market. Foreign investors keen on broadening their portfolios' geographic diversification strategies will find these findings interesting.

According to Batten *et al.* (2019), the level of interdependence between the energy and stock markets is crucial to the strategic planning, risk assessment, and capital allocation of multinational corporations and individual investors. This study examines the interconnected dynamics between a diversified oil, coal, and gas energy portfolio and Asia's ten largest stock exchanges. Using an estimation method that takes into account the time-varying framework of asset pricing—which permits regime change—we can distinguish between two key regimes. Low energy stock market integration characterizes the first regime. More than two-thirds of the sample time span (December 1992-December 2015) can be attributed to the market's tendency toward segmentation. In contrast, the second regime, one of strong integration, is characterized by fewer ways to diversify and higher volatility. Moreover, the corporation faces less favorable financial conditions in the second regime. The equity markets' valuation of energy risk under the two regimes is distinct. The high integration regime is shown to have a considerable positive energy-related equities risk premium, in addition to the low integration regime's positive equity risk premium that is unrelated to energy. In conclusion, the integration model's conditional information can help investors beat passive portfolio strategies in the stock and energy markets.

RESEARCH METHOD

There is a total of about 2088 observations in this study, which are derived from daily data from 2012-2021. For this calculation, the researchers utilize the daily closing value of the Islamic stock price index across both developing and developed member countries. Developing countries like Indonesia, Turkey, Malaysia, Qatar, Kuwait, and India stand out as well-

off compared to the United States and Japan particularly. The indices are calculated using data from S&P Dow Jones Indices and investing.com.

This investigation achieves its goals by employing a vector error correction model (VECM). For the analysis to be valid, it is necessary for a number of assumptions to be accurate. There is no correlation between independent variables, and their means are all zero (white noise). If the data is not level-stationary, then it can be made such using differentiation. The VAR first difference model is then applied (VAR-FD). One potential drawback of VAR-FD is that it does not preserve information about the historical connections between variables. For cointegrated data, the VAR model is used in conjunction with the VECM model to obtain long-term insights.

For non-stationary but potentially cointegrated variables, the Vector Error Correction Model (VECM) is a restricted form of the more general Vector Autoregression (VAR) model. In order to account for data types that are not level-stationary but are cointegrated, this additional constraint must be provided. The VECM algorithm takes advantage of this knowledge of the cointegration constraints on its implementation. Thus, VECM's rate of adaptation varies from the immediate to the distant. As a result, VECM can be understood as a VAR strategy for cointegrated, non-stationary data.

$$\Delta y_t = \Pi y_{t-1} + \Gamma_1 \Delta y_{t-1} + \ldots + \Gamma_{p-1} \Delta y_{t-p+1} + u_t$$

Where Δy_t is $y_t - y_{t-1}$, y_t is a vector containing the variables analyzed in the study, Π is the long-term parameter, Γ is the short-term parameter, and it is the error term. Data analysis using the VECM approach generally uses short-term and long-term effects, Impulse Response Function (IRF), and Forecast Error Variance Decomposition (FEVD). Before estimating VECM, several steps must be carried out, namely pre-estimation testing. These tests include the data stationarity test, VAR stability test, determination of optimal lag, and cointegration test.

RESULTS

Descriptive Statistics

The stock indices of developing and developed countries were divided into their respective categories in table 1 of descriptive statistics. The typical Sharia stock indices in both developing and developed countries fell in the range of 5.12 percent to 8.47 percent. With a range between 8.05 and 9.19 percent, the USA Islamic stock index has the greatest average among

other Islamic stock indices; this indicates that it has the highest stock price compared to the others. This high stock price is in line with the risks that exist in the USA Islamic stock index, which is reflected by the standard deviation with the highest value among the others.

Table 1. Descriptive Statistics

	Indonesia	Turkey	Malaysia	Qatar	India	USA	Japan
Mean	5.126769	8.674046	6.920698	8.274827	8.161095	8.475796	7.438708
Maximum	5.296365	9.451003	7.171572	8.504375	8.866576	9.196663	7.948806
Minimum	4.753159	8.236969	6.687894	7.876976	7.616451	8.058444	7.032933
Std. Dev.	0.097932	0.285083	0.065556	0.126964	0.265934	0.298751	0.235237
Observations	2088	2088	2088	2088	2088	2088	2088

Stationary Test

Time-series data were utilized throughout this investigation. Then, a test for data stationarity is the first step in establishing whether or not the input data was truly stationary. Incorrect or skewed conclusions can be drawn from non-stationary data. Increasing integration until the data becomes stationary transforms the non-stationary data into stationary data. In this investigation, the researchers used the Augmented Dickey-Fuller (ADF) and Philips Perron (PP) tests to determine if our level and difference data are stationary.

According to the ADF and PP tests, the data is stationary if the probability of non-stationarity is less than 0.05. Using the data in Table 2, the researchers first performed the ADF and PP tests at the level, and only if those results were stable did the researchers move on to the level difference. According to the level test results, there is a unit root for every set of data with a probability of at least 0.05. Thus, the data at this level of granularity are not static. As the test advances, the degree of integration or the gap increases. The obtained results show that there is no unit root, and the data is stationary (p-value 0.05). This finding suggests a lasting connection between developing and developed nations and Indonesia's Islamic stock index.

Table 2. Stationary Test Results

Islamic Stock Index	Augmented Dickey-Fuller (ADF)		Philips Perron (PP)	
	Level	Difference	Level	Difference
Indonesia	0.1385	0.0000	0.1340	0.0001
Turkey	0.9249	0.0000	0.9162	0.0000
Malaysia	0.0909	0.0001	0.0601	0.0001

Qatar	0.0469	0.0000	0.0811	0.0000
India	0.9404	0.0000	0.9156	0.0000
USA	0.9846	0.0000	0.9850	0.0001
Japan	0.7833	0.0001	0.7837	0.0001

Cointegration

After the optimum lag test has been carried out, it was followed by the Johansen Cointegration test to analyze the presence or absence of long-term integration between the Indonesian Islamic stock index and developing country stock indices and developed country Islamic stock indices at lag 1. The significance level of this test is set at 5%, and the trace statistic value is compared to the critical value. The results of the Johansen Cointegration test are shown in Table 3.

Johansen's experiments determine if the VAR or VECM model will be utilized. At the 5% significance level, Table 3 demonstrates a balanced link between the Indonesian Islamic stock index, the developing country stock index, and the developed country Islamic stock index, as well as similar changes in the stock index over the long run. Due to the observation of integration, the VECM model was used for this experiment.

Table 3. Cointegration Test Results

Indonesia and Developing Countries				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.020734	107.9798	88.80380	0.0011
At most, 1 *	0.012183	64.27472	63.87610	0.0463
At most 2	0.009012	38.70420	42.91525	0.1239
At most 3	0.006058	19.82062	25.87211	0.2351
At most 4	0.003420	7.145439	12.51798	0.3296
Indonesia and Developed Countries				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.012133	45.62920	42.91525	0.0261
At most 1	0.006538	20.16502	25.87211	0.2177
At most 2	0.003103	6.482290	12.51798	0.4016

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level for developing countries, and the Trace test indicates 1 cointegrating eqn(s) at the 0.05 level for developed countries

*denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

DISCUSSION

Long-Term and Short-Term Integration

According to the pre-estimation test results, the VECM model is implemented because all variables are difference-stationary and cointegrated. Lag 1 has shown to be most successful in the VECM model. The intermediate- and long-term VECM estimation findings are presented in Table 4. Long-term, the Islamic stock index in Indonesia follows the trends seen in the Islamic stock indices of Malaysia, Qatar, India, the United States, and Japan. However, the Indonesian Islamic stock index reflects these trends a month earlier. Thus, short-term effects can be seen in Islamic stock indices in Turkey and Japan.

Indonesia's Islamic stock index with Turkey affects the short term but not the long term. According to the Ministry of Foreign Affairs of the Republic of Indonesia (2021), the cooperative relationship between Indonesia and Turkey has been going on for a long time and is currently entering a new phase that further demonstrates the strategic value of the two countries with the launch of the "Joint declaration Indonesia-Turkey: Toward an Enhanced Partnership in a New World Setting" where the two countries are committed to cooperating, one of which is in the economic sphere with a target of US$ 10 billion by 2023. Indonesia and Turkey have excellent trade potential, but the realization is still tiny. Currently, the trading volume between the two is only around US$ 1.5 billion, which is still far from its true potential.

Table 4. Short-Term and Long-Term Results

Islamic Stock Index	Coefficient	t-statistic
Short-Term		
Turkey	0.045216	2.37569*
Malaysia	0.056758	1.85105
Qatar	-0.024856	-1.13002
India	-0.016286	-1.04282
USA	0.009591	0.45302
Japan	0.047662	2.24690*
Long-Term		
Turkey	-0.176158	-0.11404
Malaysia	8.056244	3.55487*
Qatar	-8.045002	-6.41477*
India	15.20192	7.53467*
USA	-6.341088	-3.30768*
Japan	-15.28591	-7.23298*

Indonesia's Islamic stock index with Malaysia influences the long term but not the short term. The Coordinating Ministry for Economic Affairs of the Republic of Indonesia (2021) stated that Malaysia is one of the main economic partners in investment and trade. Data from the Ministry of Trade (2021) revealed that foreign investment from Malaysia reached US$ 706.8 million spread over 1,324 projects. Then, in terms of trade in goods, bilateral trade volume between countries reached US$ 15.03 million in 2020 and US$ 13.43 million in 2021. The data shows that the relationship between the two countries is very intense in the economic field.

Indonesia's Islamic stock index with Malaysia influences the long term but not the short term. Indonesia's opportunities to market its products are still very open. In 2014, Indonesia's total trade with Qatar reached US$ 1.68 billion. However, this value fell to USD 828 million in 2015 and increased to USD 1.5 billion in 2018. Indonesia's products marketed in Qatar include processed food/beverages, coffee, sugar, salt, tea, cooking oil, wheat flour, and fruits. In addition, there are motor vehicle spare parts, electricity, electronic equipment, and supplies for building materials.

Indonesia's Islamic stock index with India influences the long term but not the short term. Indonesia has continuously recorded a surplus in trade with India. Data from the Ministry of Trade of the Republic of Indonesia recorded that Indonesia's trade value with India in 2017 reached US$ 18.13 billion. This amount consists of the value of Indonesia's exports to India of US$ 14.98 billion and Indonesia's imports from the country of US$ 4.05 billion. As a result, Indonesia's trade balance was a surplus of US$ 10.04 billion. This figure is the largest since 2013. However, in 2018 Indonesia's trade with India during the Jan-Mar 2018 period decreased 2.99% to US$ 4.32 billion from the same period the previous year. Indonesia's exports to India shrank 7% to US$ 3.2 billion from the previous year, while imports from India increased 10.82 percent to US$ 1.1 billion. Indonesia's trade balance fell 14.4 percent to US$ 2.09 billion from the same period the previous year.

Indonesia's Islamic stock index with the United States influences in the long term but not in the short term. The Ministry of Trade (2021) noted that the trade balance between Indonesia and the United States (US) consistently scored a surplus. Although Indonesia's exports had experienced a decline, the decline in imports was more excellent so that the surplus remained. In 2019, the export value of Indonesia and the United States fell 3.8 percent to US$ 17.7 billion. Meanwhile, imports declined by 8.8% to US$ 9.3 billion, resulting in a 2.4% increase in the value of the trade balance from US$ 8.3 billion in 2018 to US$ 8.5 billion in 2019. The increase in imports of raw materials reflects an increase in the performance of the real sector. At the

same time, the increase in capital goods is also quite good because it impacts increasing production capacity.

Indonesia's Islamic stock index with Japan influences the long term but not the short term. Japan is an essential partner for Indonesia. Despite being faced with various global challenges, relations between the two countries remain strong. The Ministry of Trade (2020) stated that the value of bilateral trade between Indonesia and Japan in 2020 reached US$ 24.3 billion. During the 2018 to 2020 period, Japan consistently ranked 3rd as Indonesia's leading export destination, with export values in 2020 reaching US$ 13.6 billion. This condition continues, wherein semester 1 - 2021, Indonesia's exports to Japan have reached a value of US$ 7.9 billion. In terms of investment, during the period 2018 to Semester I - 2021, Foreign Investment (PMA) from Japan that entered Indonesia reached US$ 12.9 billion.

Meanwhile, Japan became the third largest foreign investment country entering Indonesia. Until the first half of 2021, FDI from Japan entering Indonesia has reached US$ 1.04 billion. Meanwhile, the total PMA projects from Japan reached more than 19 thousand projects during that period. The Indonesian government hopes that foreign direct investment from Japan entering 2021 will be able to exceed the realization in 2020, which reached US$ 2.6 billion.

Impulse Response Function

Examining how one variable reacts to shocks of a different variable by a single standard deviation is the purpose of the Impulse Response Function (IRF) study. The shocks emerge from both the variable and other factors. This IRF study will assess the reaction of endogenous variables inside the VAR system to external shocks. Because the i-variable influences the i-variable, certain shocks are caused by the variable and other variables. In VECM, there is transmission to all other variables through the lag structure. IRF describes the response of each dependent variable to the shock of the independent variable and the length of time to achieve stability so that the IRF does not describe the magnitude of the impact of one variable on other variables.

The study forecasts the performance of an index of Islamic companies listed on the Indonesian stock market for the next 300 months. The results of the IRF analysis in this study will explain the response of the Indonesian Islamic stock index if there are shocks in the Islamic stock indices of Turkey, Malaysia, Qatar, India, the USA, and Japan. In general, at the beginning of the shock of one standard deviation, the Indonesian Islamic stock index has not responded to any shocks from other Islamic stock indices. The response

of the Indonesian Islamic stock index began to be seen in the second period when the Indonesian Islamic stock index responded with positive and negative responses. When other stock markets in Turkey, Malaysia, the United States, and Japan were shaken, Indonesia's Islamic stock index climbed, in contrast to Qatar and India.
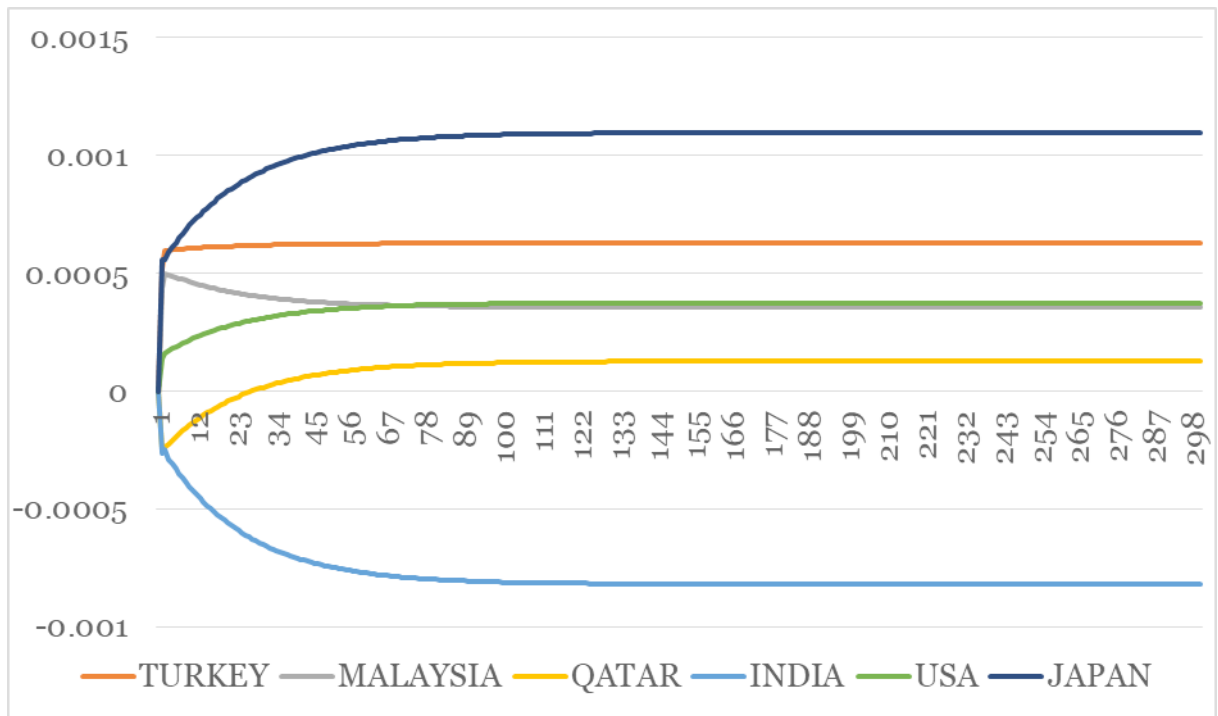

Figure 1. Impulse Response Function Result

Forecast Error Variance Decomposition

Forecast Error Variance Decomposition (FEVD) analysis on the VECM method is used to identify and explain the contribution of each variable shock to the main variables observed. This FEVD method can see the strengths and weaknesses of each variable in influencing other variables over a long period. This study uses a FEVD analysis to determine the relative impact of external shocks on the Indonesian Islamic stock index for the countries of Turkey, Malaysia, Qatar, India, the United States, and Japan.

The period used is the next three years which consists of 300 months. The results show that Indonesia's Islamic stock index dominates with an average of 98.37 percent, followed by Japan's Islamic stock index at 0.73 percent, India at 0.38 percent, Turkey at 0.29 percent, Malaysia at 0.12 percent, the USA at 0.08 percent, and Qatar by 0.01 percent. One of the potential locations for investments is a nation that offers a high rate of return on capital. The amount of trust an investor has in their ability to invest in other nations is impacted not just by favorable tax regimes and cost structures but also by good infrastructure.
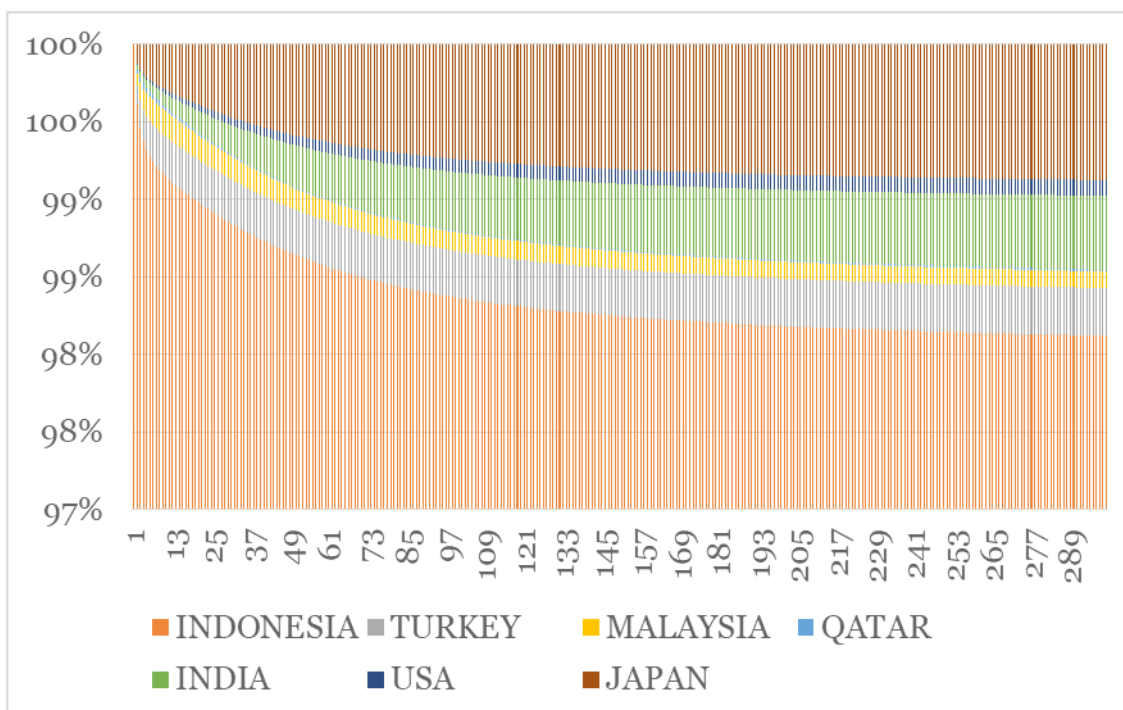
Figure 2. Decomposition of the Error Variance in the Forecast

CONCLUSION

The estimated effects of the Turkish and Japanese Islamic stock indices on the Indonesian Islamic stock indices show both a short-term and a long-term influence. On the other hand, Islamic stock indices have produced long-term effects in Malaysia, Qatar, India, and the United States. There were positive and negative responses to the Indonesian Islamic stock index. Indonesians were upbeat about the effects of shocks on Islamic stock indices in Turkey, Malaysia, the US, and Japan, while their counterparts in Qatar and India were skeptical. Islamic stock indices in Japan and Indonesia have been influenced by the latter country's efforts to broaden their respective markets.

In order to play a role in mitigating the impacts of shocks on the Islamic stock market in both developing and developed countries and improving the velocity of stock market integration, Indonesia's Islamic stock index has to raise the bar on stock market structure and infrastructure. When countries cooperate to integrate their stock markets, they can better ensure that their capital markets are prepared to accept foreign investors and comply with applicable regulations.

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