

Comparative Analysis of Sharia Stock Price Indices in Indonesia, Turkey, China, and Malaysia: A Study of Integration in Sharia Capital Markets

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Abstract

The main objective of this research is to determine the long-term and short-term impacts of the relationship between the Dow Jones Islamic Market Turkey Index (DJIMTR), Dow Jones Islamic Market China/Hong Kong, Titans 30 Index (DJCHK), and Dow Jones Islamic World Malaysia Titans Index 25 (DJMY25) against the Indonesian Sharia Stock Index (JKISSI). The research method used is the Vector Error Correction Model (VECM) with Eviews 10 as an analysis tool. The data used is time series data, namely monthly data from January 2016 to May 2022, obtained from the investing.com and finance.yahoo.com websites. The study results show that in the short term, none of the independent variables significantly impact JKISSI. However, in the long term, DJIMTR and DJCHK show a significant negative influence on JKISSI, while DJMY25 has a significant positive influence on JKISSI. There is a need for policies that strengthen the integration of sharia capital markets in the long term to strengthen stability and economic growth in related countries. In addition, it encourages more research to understand the dynamics of the Islamic capital market and identify important factors that influence its performance. This research is expected to understand better long-term and short-term relationships in Islamic capital markets in Indonesia, Turkey, China, and Malaysia.

Keywords: Integration, Islamic Capital Market, VECM, DJIM.

1. Introduction

A nation's advancement and economic growth undoubtedly necessitate access to capital, which can either come from within the country or be sourced from international

sources. Information and Technology (IT) plays a pivotal role in the era of modernization, significantly impacting economic progress. Globalization, as a driving force, fosters integration in the global market, making it virtually impossible for any country to remain unaffected by economic developments in other nations (Houidi and Ellouze, 2022). From an economic perspective, globalization entails incorporating each nation's economy into the global economic system. Consequently, it allows investors to select more productive capital markets for investment, aiming to achieve higher profits (Salihin, 2019).

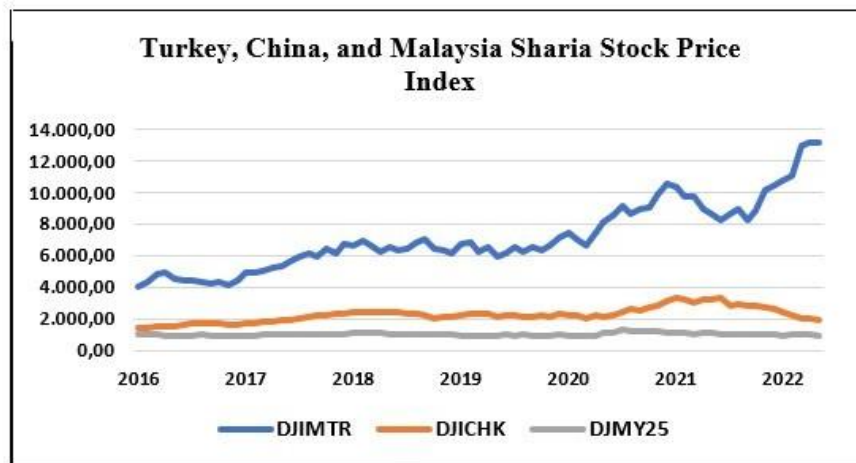
The capital market serves as a means to evaluate the productivity of companies within a country since it typically represents the collective performance of companies. The shifts in the capital market, characterized by increases (bullish) and decreases (bearish), are reflected in the fluctuations of stock prices, which are, in turn, mirrored in the movements of the stock price index (Nur Wulan, 2020). The capital market serves as both the tools and platforms for driving economic development within a country. It facilitates the creation and accumulation of long-term funds, thus promoting broader public involvement in gathering resources, which, in turn, fosters financial support for national development and growth initiatives. According to Dah et al., (2015) the increasingly developing world of ethical investment has led to the emergence of similar but more stringent types of investment, sharia-compliant investments.

The Islamic capital market functions as a platform where the entire trading process, particularly involving issuers and the securities being traded, adheres to the principles and guidelines derived from Islamic teachings and Sharia. Sharia-compliant securities aim to align with the statutory regulations of the capital market, ensuring that contracts and management within a company, as well as the methods of issuance, comply with the regulations outlined in Al-Quran Al-Karim and Hadiths of the Prophet Muhammad (SAW) (Fauzan and Suhendro, 2018). Herry (2021) has expressed a view that the Islamic capital market is a domain where its operations are inherently guided by and adhere to the teachings of Islam in their transactions. It encompasses a comprehensive understanding of Islamic religious prohibitions, notably including usury, gambling, and speculative practices.

The role and function of the capital market in Indonesia are of paramount significance in bolstering economic development and facilitating advantages for local business endeavors. Indonesia stands out as a nation with the largest Muslim population, which has a notable impact on the capital market. This impact extends to increasing funds available for companies, ultimately boosting production and employment opportunities, thereby bringing prosperity to all residents. As a result, the Islamic capital market in Indonesia holds substantial potential to influence its growth rate and attract the interest of foreign investors seeking investment opportunities in the country (Rifai, Prihantoro, and Suwarno, 2022). ISSI can be defined as an overall index of Islamic stocks existing on the IDX. On 12 May 2011, ISSI was launched as a reflection of the movement of all Sharia shares traded on the IDX. The method used to calculate the Islamic stock index uses the weighted average of the market capitalization of all Islamic stocks. ISSI is different from JII, where ISSI is an index of all sharia stocks contained and recorded in DES. At the same time, JII is part of ISSI with 30 (thirty) selected sharia stocks (SAPUTRA, n.d.).

As part of developing the sharia capital market, in 1999, Dow Jones launched several sharia market indices (ibid.). DJIMI was created to assess global equity performance in line with Islamic principles. The presence of DJIMI is expected to foster the expansion

and progress of Islamic capital markets worldwide. Consequently, there has been an upward trend in the index from 2016 to 2022, particularly in countries with a predominantly Muslim population, as well as in countries like China, in areas where the majority of the population is not Muslim (Ardana, 2017). The Islamic stock price index movements in Turkey, China, and Malaysia from January 2016 to May 2022 are illustrated as follows:



Source: data processed from Investing.com

Figure 1. Sharia Stock Price Index in Turkey, China, and Malaysia (January 2016 - May 2022).

Figure 1 presents the Sharia Stock Price Index data for three countries spanning from January 2016 to May 2022. Notably, DJIMTR (Turkey) boasts the highest Sharia Stock Price Index, followed by DJICHK (China) and DJMY25 (Malaysia). Consequently, it can be deduced that Turkey holds the distinction of having the world's most substantial Islamic stock price index. In April 2022, the value of its stock price index has reached 13,185.05, whereas China stood at 1,990.84, and Malaysia at 995.38. This pattern can be attributed to Turkey's status as a nation with a predominantly Muslim population, resulting in significant fluctuations in its Islamic capital market. DJIMTR exhibited consistent monthly fluctuations with an overall upward trajectory. According to Fatma (2019) Turkey is a country secular by having various religions, in 2017 the number Turkey population is 79,815,000 people, with the majorities of religion Muslim are 82% of the entire population, 2% are Christians, 7% are not religion and 2% other religions.

Between January 2016 and May 2022, China's Islamic stock price index demonstrated a range of movement between 1500 and 3500. This data underscores the considerable volatility in China's Islamic capital market, with notable fluctuations, particularly in 2022 when there was a noteworthy decline in the Dow Jones Islamic Market China/Hong Kong Titans 30 Index (DJICHK). In contrast, the fluctuations in the value of the Malaysian Islamic stock price index occur within the range of 800 to 1400., indicating a relatively stable trend in the Dow Jones Islamic World Malaysia Titans 25 Index (DJMY25). This suggests that the Malaysian Islamic capital market experienced more moderate fluctuations when compared to the more significant variations observed in Turkey and China.

Figure 2 depicts the average price index of the Indonesian Sharia Stock Index (ISSI) from 2016 to 2022. ISSI follows a trend that is in line with the Dow Jones Islamic Market (DJIM) indices from Turkey, China, and Malaysia. However, it's noteworthy that the value of ISSI is considerably lower than the indices of these countries. This decline

in the Indonesian Sharia Stock Index can be attributed to the significant impact of the Covid-19 pandemic on the nation's economic performance. This situation is particularly concerning as Indonesia is recognized for having the largest Muslim population globally. In contrast, China, which has a smaller Muslim population but the highest total population worldwide, boasts a higher Sharia stock price index than Indonesia. Therefore, researchers are inclined to explore and understand the relationships and dynamics among these four countries.



Source: data processed from Investing.com

Figure 2. Indonesia Sharia Stock Price Index (January 2016 - May 2022).

Capital market integration is a state in which the prices of Sharia-compliant assets on a country's stock exchange are interconnected with those on global stock exchanges, facilitating unrestricted access. This interconnectedness between world stock exchanges or global capital markets leads to a situation where the capital markets of a country are influenced by those of other nations, thereby making it more convenient for foreign investors to invest in those countries (Roofica and Pertiwi, 2021). As per the findings of Tiwang, Karamoy, and Maramis, 2020 capital market integration is characterized by a strong connection between a country's capital market and those of other nations, resulting in mutual influence on prices. This integration leads to a situation where global capital markets naturally converge towards international price levels for their respective stock markets.

The continuous progression of technology and the ready availability of information have a significant impact on swift macroeconomic transformations, particularly in developed nations, within the context of global economic shifts. One of the primary areas affected by these changes is investment within the capital market. Indonesia, as one of the Group of Twenty (G20) nations, is intricately connected to the dynamics of the global capital market and international collaborations aimed at enhancing the economic situation or condition of the country. The expansion of the Indonesian Sharia Stock Index is impacted by a combination of both internal and external factors associated with companies operating within the market (Soekapdjo, 2021). This research basically does not discuss the technical level that occurs in every financial market, but as a simple overview of the movement and development of the financial market and can help investors in tak-

ing appropriate sharia investment decisions and consider the factors in determining the investment to be made both domestically as well as abroad.

Vebriadi and Nugroho, 2018 said Indonesia and Turkey are both part of the Organization of Islamic Cooperation (OIC), also referred to as the Islamic Cooperation Organization. This international organization was founded on September 25, 1969, and it currently includes 57 member countries. According to Andiansyah, 2021 in recent decades, developing nations, including those within the Organization of Islamic Cooperation (OIC), have shown a strong commitment to enhancing financial inclusion within their borders. The reason for this focus is that inclusive finance is known to make a positive impact on economic growth and plays a crucial role in attracting foreign capital flows to the countries that implement it. Kurniawan, 2019 Collaboration within the Islamic capital market primarily aims to strengthen trade relationships within the region and promote more profound economic integration at the regional level. The integration of the Islamic capital market has the potential to increase the importance of this market in driving economic development across multiple countries. For instance, in the case of Indonesia and Turkey, both having the world's largest Muslim populations, there exists the potential for mutual influence and collaboration between these nations.

China is a developed country in Asia which is one of countries invests in Indonesia and becomes the country that owns the investment third largest after Singapore and Japan. China is also one of the countries that its trade best economy in the world, an increase in terms of export-import based on sharia which makes it very influential on Islamic finance including Indonesia sharia finance. With there an agreement made by the regional community ASEAN countries with China in forming a community 6 free trade, debuted as ACFTA (ASEAN China Free Trade Area) (Novia, Zuliensyah, and Nurmalia, 2021). According to Kusuma, Sheilla, and Malik, 2020 Import activity indicates a level of consumption that is in line with income and a level of dependence on goods and services needed by people in a country because they are unable to produce and meet consumption needs.

Zakiyyah, 2020 said more than a decade ago, the respective heads of state in Southeast Asia agreed to establish an ASEAN Community in the Economic, Socio-Cultural and Security fields. From this agreement, one of the ASEAN communities that have been agreed upon integration in the economic field which were formed to deal with free trade among ASEAN countries, In that case, Indonesia and Malaysia are among the Asian countries. Kurniawan, 2019 in their research found that DJMY25 had an effect positive and significant to ISSI. if any an increase in DJMY25 will be followed by an increase in ISSI. Oktaviani, 2017 stated Malaysia and Indonesia are neighboring countries that are members of the ASEAN countries and certainly these two countries have the same population the majority are Muslims. Both of them have a bilateral agreement between Bursa Indonesian securities with the Malaysia Exchange are related about trading by several industry and sharia products so as to provide opportunities for investors Indonesia to participate in share trading in Malaysia.

Previous research focused on the comparison or integration of sharia stock price indices in Islamic Cooperation Organization countries, Southeast Asia and several countries with certain criteria as well as studies on the sharia capital market using a simple research model. Previous research may have examined Islamic capital markets in one country or several countries separately, but this research offers a more holistic under-

standing by comparing representative developed and developing countries from various geographic regions and levels of economic development within the Asian continent. took a more comprehensive approach by comparing sharia stock price indices in four countries at once: Indonesia, Turkey, China and Malaysia. This provides a more complete picture of the dynamics of the Islamic capital market. Indonesia is among several countries with integration possibilities with other nations due to its participation in the global capital market. Consequently, this has repercussions for Muslim investors engaged in the Islamic capital market, both within the country and abroad. Even when they invest in stocks that align with Sharia principles, these investors remain interconnected with the developments in global capital markets and the broader global economic landscape. The existence of the Islamic capital market in Indonesia, with its substantial Muslim population, presents a significant opportunity to contribute to the overall prosperity of the national economy (Feriyanto et al., 2018).

By looking at a comparison of sharia stock price indices in Indonesia, Turkey, China and Malaysia, as well as a study of integration in the sharia capital market, this research aims to provide in-depth insight into the dynamics and relationships between sharia capital markets in four countries. Through this understanding, it is hoped that urgency and policy recommendations can be found that strengthen the integration of sharia capital markets globally, supporting sustainable and inclusive economic growth at the national and international levels. With the various backgrounds that have been explained, It is essential to undertake research regarding Comparative Analysis of Sharia Stock Price Indices in Indonesia, Turkey, China, and Malaysia: A Study of Integration in Sharia Capital Markets.

2. Methods

2.1. Data Types and Source

The type of data used in this research is quantitative data where the data is a time series, namely data starting in January 2016 to May 2022. Data collection methods in this research is secondary data collection. Secondary data obtained by researchers is by carrying out documentation techniques to support the discussion material related to this research. All data in this research was obtained from the websites investing.com and finance.yahoo.com.

The Indonesian Sharia Stock Index (JKISSI) is an index that calculates the average price of stocks in Indonesia that adhere to Sharia criteria. DJIMTR is an index created to assess the performance of stocks traded in Turkey. subject to compliance with Sharia investment guidelines. DJCHK measures the 30 largest companies operating in China and Hong Kong, listed on the Hong Kong Stock Exchange. To be included in this index, components must adhere to Islamic investment guidelines. DJMY25 was first launched on April 17, 1999. DJMY25 takes into account the amount of interest income that companies receive from traditional deposits or other interest-bearing financial instruments. All the data used in this study are in a monthly format, covering the period from January 2016 to May 2022, and were sourced from the investing.com website.

2.2. Population and Sample

The population under consideration encompasses all groups of individuals, events, or elements of interest that the researcher intends to investigate or study (Hanafiah et al., 2020). In this study, the population includes the complete set of Islamic stock price indices found within the Dow Jones Islamic Market (DJIM), encompassing a total of 34 countries. A sample, on the other hand, is a smaller subset of this population. It consists of specific members chosen from the population for the purpose of the research. Not every entity within the population is sampled; rather, the sample represents a subgroup or a portion of the larger population (Hanafiah et al., 2020). The study employs purposive sampling, a method of sample selection based on specific criteria. As a result, the sample for this study consists of four countries: Turkey, China, Malaysia, and Indonesia, which have been selected based on particular criteria or characteristics.

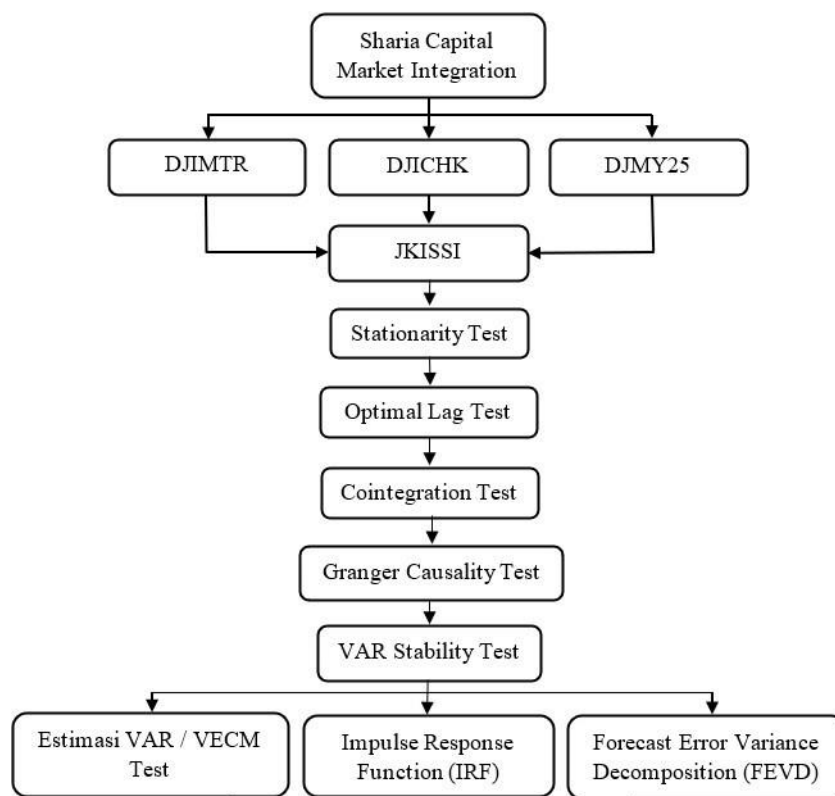
2.3. Data Analysis Techniques

This research is quantitative in nature, focusing on four Asian countries: Indonesia, Turkey, China, and Malaysia, spanning from January 2016 to May 2022. The data analysis technique used in this research is the Vector Error Correction Model (VECM) analysis method, and the analytical tool employed is EViews 10 software. The study encompasses various tests, including Stationarity Test, Optimal Lag Test, VAR Stability Test, Cointegration Test, Granger Causality Test, Vector Error Correction Estimation, Impulse Response Function, and Forecast Error Variance Decomposition. The research model is designed to investigate the integration of the Islamic capital market in Asia and Europe, specifically focusing on the relationships between Indonesia, Turkey, China, and Malaysia:

$$\begin{bmatrix} \Delta JKISSI_t \\ \Delta DJIMTR_t \\ \Delta DJICHK_t \\ \Delta DJMY25_t \end{bmatrix} = \begin{bmatrix} a_{10} \\ a_{20} \\ a_{30} \\ a_{40} \end{bmatrix} + \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} & a_{15} & a_{16} & a_{17} & a_{18} \\ a_{21} & a_{22} & a_{23} & a_{24} & a_{25} & a_{26} & a_{27} & a_{28} \\ a_{31} & a_{32} & a_{33} & a_{34} & a_{35} & a_{36} & a_{37} & a_{38} \\ a_{41} & a_{42} & a_{43} & a_{44} & a_{45} & a_{46} & a_{47} & a_{48} \end{bmatrix} \begin{bmatrix} \Delta JKISSI_{t-i} \\ \Delta DJIMTR_{t-i} \\ \Delta DJICHK_{t-i} \\ \Delta DJMY25_{t-i} \end{bmatrix} - \lambda \begin{bmatrix} u_{1t} \\ u_{2t} \\ u_{3t} \\ u_{4t} \end{bmatrix}$$

These indices play a central role in the analysis and investigation of the integration of the Islamic capital market across the specified countries. To clarify, the research is centered on the following indices: JKISSI: Indonesian Sharia Stock Index
DJIMTR: Dow Jones Islamic Market Turkey Index
DJICHK: Dow Jones Islamic Market China/Hong Kong Titans 30 Index
DJMY25: Dow Jones Islamic World Malaysia Titans 25 Index.

The stages that must be carried out in the figure of VAR/VECM analysis are as follows following:



Source: Author, 2024

Figure 3. Research Model.

3. Results and Discussion

3.1. Stationarity Test

The first stage of this research entails performing unit root tests to determine the stationarity of the data. This is crucial to prevent issues like spurious regression. In cases where the data is non-stationary at the level, a differencing process (often first differencing) is applied to achieve stationarity. The Augmented Dickey-Fuller (ADF) test is the method used for this purpose, and significance is typically determined at a confidence level of 5% (0.05). The unit root test is carried out at both the original level and following the first difference (Tiwang, Karamoy, and Maramis, 2020)

The outcomes of the unit root test conducted at the original data level indicated that none of the variables, including JKISSI, DJIMTR, DJCHK, and DJMY25, displayed stationarity at the 5% significance level. This non-stationary characteristic is evident in Table 1, where the absolute value of the t-statistic for the Augmented Dickey-Fuller (ADF) test was lower than the MacKinnon Critical Value at the 5% significance level. Consequently, a stationarity test was conducted at the first difference level. At this level, all four variables, namely JKISSI, DJIMTR, DJCHK, and DJMY25, were found to exhibit stationarity at the 5% significance level. The proof of stationarity is presented in Table one, in situations where the absolute value of the t-statistic for the ADF test exceeded the absolute value of the MacKinnon Critical Value at the 5% significance level. This trans-

formation to first differences helps ensure that the data is suitable for time series analysis. This study follow Kurniawan, 2019 not apply second difference of unit root test can led bias in the model.

Table 1. Unit Root Test Results at Level and First

Variable	ADF value	McKinnon critical value			P Value	Information
		1%	5%	10%		
Unit Root Test Results at Level						
JKISSI	-2.184498	-3.519050	-2.900137	-2.587409	0.2136	Not Stationary
DJIMTR	0.714225	-3.519050	-2.900137	-2.587409	0.9918	Not Stationary
DJICHK	-1.715594	-3.519050	-2.900137	-2.587409	0.4194	Not Stationary
DJIMY25	-2.288904	-3.519050	-2.900137	-2.587409	0.1782	Not Stationary
Unit Root Test Results at Level						
JKISSI	-7.423969	-3.520307	-2.900670	-2.587691	0.0000	Stasioner
DJIMTR	-7.864809	-3.520307	-2.900670	-2.587691	0.0000	Stasioner
DJICHK	-4.381888	-3.520307	-2.900670	-2.587691	0.0007	Stasioner
DJIMY25	-8.948616	-3.520307	-2.900670	-2.587691	0.0000	Stasioner

Source: data processed 2024

3.2. Optimum Lag Test

The determination of the optimal lag is crucial in VAR (Vector Autoregression) analysis. Several criteria, such as the Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Criterion (HQ), are used to select the appropriate lag order. The goal is to select the lag order that minimizes the chosen criterion. Typically, the lag order indicated by an asterisk (*) and representing the smallest value on the selected criterion is chosen. This determination is vital because it helps eliminate issues related to autocorrelation in the VAR system. By selecting the optimal lag order, it is expected that autocorrelation problems will be minimized, improving the accuracy and reliability of the VAR analysis results (Novia, Zuliensyah, and Nurmalia, 2021).

Table 2. Optimal Lag Test Root Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1527.267	NA	2.22e+14	44.38454	44.51405*	44.43592*
1	-1519.784	13.88028	2.84e+14	44.63143	45.27899	44.88834
2	-1504.883	25.91550	2.95e+14	44.66327	45.82889	45.12571
3	-1498.888	9.731241	3.99e+14	44.95327	46.63694	45.62124
4	-1463.861	52.79413	2.35e+14	44.40176	46.60349	45.27526
5	-1443.753	27.97641*	2.17e+14*	44.28269*	47.00247	45.36172
6	-1428.223	19.80550	2.33e+14	44.29633	47.53417	45.58089
7	-1416.075	14.08570	2.84e+14	44.40796	48.16385	45.89804

Source: data processed 2024

In Table 2, the optimal lag length with the highest model goodness test value is denoted as the fifth lag, indicated by an asterisk (*). Based on this information, the

author has chosen the fifth lag as the optimal lag order for the analysis. This selection is consistent with the calculation of the Akaike Information Criterion (AIC), which also identifies the fifth lag as optimal. With the optimal lag determined as 5, the next step is to proceed with the VAR (Vector Autoregression) stability test, which involves estimating the VAR equation model using this lag order for the analysis. This step ensures that the VAR model is stable and suitable for further analysis.

3.3. VAR Stability Test

Indeed, the stability of a VAR (Vector Autoregression) model is determined by the behavior of its roots. A VAR (Vector Autoregression) model is deemed stable when all its roots have an absolute value less than one and are contained within the unit circle. In simpler terms, a VAR model is considered stable if the absolute values of its roots are less than 1. Conversely, if the absolute value of any root is greater than 1, the VAR model is considered to be unstable. A stable VAR model is desirable as it ensures that the dynamics of the model do not exhibit explosive behavior and can be used for reliable time series analysis and forecasting (Puspitasari, Siregar, and Andati, 2015).

Table 3 provides data indicating that all the absolute values of the Indonesian Sharia Stock Price Index (JKISSI), Turkey (DJIMTR), China (DJCHK), and Malaysia (DJMY25) from January 2016 to May 2022 are less than 1 (<1). This strongly suggests that the VAR (Vector Autoregression) model is stable. The modulus values, ranging between 0.284680 and 0.964886, all fall within this range, confirming the model's stability. Consequently, the VAR stability test supports the validity and reliability of subsequent analyses, including the Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD), for further examination and interpretation. Var stability test results are below:

Table 3. VAR Stability Test Results

Root	Modulus
-0.964886	0.964886
0.915963	0.915963
0.043312 + 0.841207i	0.842321
0.043312 - 0.841207i	0.842321
0.762198 - 0.330272i	0.830678
0.762198 + 0.330272i	0.830678
-0.664330 - 0.479616i	0.819370
-0.664330 + 0.479616i	0.819370
0.513766 - 0.629790i	0.812767
0.513766 + 0.629790i	0.812767
-0.230335 - 0.772138i	0.805762
-0.230335 + 0.772138i	0.805762
0.803615	0.803615
-0.736566 + 0.094403i	0.742591
-0.736566 - 0.094403i	0.742591
0.273535 - 0.664717i	0.718798
0.273535 + 0.664717i	0.718798
-0.209766 + 0.517418i	0.558322
-0.209766 - 0.517418i	0.558322
-0.284680	0.284680

Source: data processed 2024

3.4. Cointegration Test

Cointegration testing is typically performed after ensuring that all variables have achieved stationarity at the first difference level. The Johansen cointegration test is used for this purpose. This test helps determine the number of cointegrations present in the model. Specifically, if the Trace statistic, a component of the Johansen cointegration test, surpasses the Critical Value, it indicates that the equations in the model display cointegration. Cointegration signifies a long-term relationship between the variables in the model, which is an important concept in the field of time series analysis (Tiwang, Karamoy, and Maramis, 2020).

The audience context as the initial recipients (the companions) in Esack's view is crucial because the Quran was not directly formulated into a composed book. The Quran was revealed in response to the actual social issues prevailing at that time. It was recited to the Prophet, absorbed, and memorized by the companions, thus becoming a reference for their practices when facing the social situations and society of that era. In Esack's perspective, revelation is rich with elements that provoke progressive actions, emanating from the responsive impact of social change (Muhammad Rahman, 2022). Furthermore, Farid Esack characterizes liberation theology as a movement aimed at emancipating religion from societal, political, and religious frameworks rooted in unquestioning compliance, and advocating for the liberation of individuals from various forms of injustice and exploitation, encompassing race, gender, class, and religion (rehman2017islamic).

Table 4. Cointegration Test Results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.446546	85.00276	47.85613	0.0000
At most 1 *	0.276858	43.59245	29.79707	0.0007
At most 2 *	0.213305	20.90200	15.49471	0.0069
At most 3 *	0.056997	4.108002	3.841466	0.0427

Source: data processed 2024

Table 4 shows that there are four equations in this study displaying cointegration at a 5% significance level. This is apparent as the Trace statistic exceeds the Critical Value. More specifically: At most 1, the Trace statistic is 43.59245, surpassing the critical value of 29.79707. At most 2, the Trace statistic is 20.90200, also exceeding the critical value of 15.49471. At most 3, the Trace statistic is similarly greater than the critical value, with a value of 4.108002 compared to a critical value of 3.841466. The presence of cointegration in these equations implies a long-term relationship between the involved variables, which is a crucial discovery in time series analysis.

3.5. Granger Causality Test

Granger causality test is utilized to investigate the causal relationship between variables in a model. It helps determine whether one variable can be used to predict changes in another variable, indicating a cause-and-effect relationship between them. This test is valuable for investigating the dynamic interactions and potential lead-lag relationships among variables in a time series analysis.

Table 5. Granger Causality Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.
DJIMTR does not Granger Cause JKISSI	72	0.17492	0.9710
JKISSI does not Granger Cause DJIMTR	2.46670	0.0423	
DJICHK does not Granger Cause JKISSI	72	0.97885	0.4380
JKISSI does not Granger Cause DJICHK	1.82662	0.1210	
DJMY25 does not Granger Cause JKISSI	72	1.34625	0.2572
JKISSI does not Granger Cause DJMY25	4.96390	0.0007	

Source: data processed 2024

Table 5 indicates that JKISSI has a significant impact on DJIMTR, as evidenced by a probability value of 0.0423, which is less than 0.05 at the 5% significance level. On the other hand, DJIMTR does not have a significant effect on JKISSI since the probability value exceeds 0.9710, which is greater than 0.05. This suggests a one-way causal relationship from JKISSI to DJIMTR. Furthermore, DJICHK does not exert a significant influence on JKISSI, and JKISSI does not significant impact on DJICHK, as the probability values are both greater than 0.05. In this case, it can be concluded that there is no causal relationship between DJICHK and JKISSI. However, this is different from Sella et al (2021) where there is a reciprocal relationship between DJICHK and JKISSI. Thus, there is a one-way relationship between DJICHK and JKISSI. Lastly, DJMY25 does not appear to have a significant impact on JKISSI because the probability value is greater than 0.05. However, JKISSI significantly affects DJMY25, with a probability value of 0.0007. Therefore, it can be inferred that there is a one-way causal relationship from JKISSI to DJMY25. This is the same as Sella ET AL (2021) research where JKISSI had an influence on DJMY25 while DJMY25 did not have a significant influence on JKISSI. Thus, there is a one-way relationship between DJMY25 and JKISSI.

3.6. Vector Error Correction Model (VECM)

Table 6. Long-Term and Short-Term VECM Estimation Results

Long-Term			
Variable	Coefficient	t-Statistic	t-Table
DJIMTR	-0.019476	[-2.06286]	1.99300
DJICHK	-0.097001	[-2.91015]	1.99300
DJMY25	0.838970	[6.61104]	1.99300
Short-Term			
Variable	Coefficient	t-Statistic	t-Table
DJIMTR (-1)	-0.000458	[-0.15187]	1.99300
DJICHK (-1)	0.006168	[0.54419]	1.99300
DJMY25 (-1)	-0.054419	[-0.84088]	1.99300

Noted:*,**,*** significance at level10%, 5% and 1% respectively

The results in Table 6 demonstrate that the variables DJIMTR, DJICHK, and

DJMY25 exert a significant influence on the Indonesian Sharia Stock Price Index (JKISSI) in long-term. This significance is evident as the t-statistic values are greater than the critical t-table value, which is 1.99300, as follows: For the DJIMTR variable, the t-statistic is -2.06286, which is greater than 1.99300. For the DJCHK variable, the t-statistic is -2.91015, surpassing the 1.99300 threshold. And the DJMY25 variable has a t-statistic of 6.6110, which is also greater than 1.99300. These findings align with the research conducted by Novia, Zuliansyah, and Nurmalia, 2021 which suggests that DJCHK and DJMY25 have a significant impact on the Indonesian Sharia Stock Index (JKISSI) in the long term. In summary, the analysis indicates that these variables play a substantial role in influencing JKISSI.

Kurniawan, 2019 found that the Malaysian stock index had a positive and significant effect on the stock index in Indonesia. This suggests that there was a notable relationship between the stock indices of the two countries, and that changes in the Malaysian stock index had a meaningful impact on the Indonesian stock index. Such research findings are important for understanding the interconnectedness of stock markets across different countries and regions. Soekapdjo, 2021 found the Dow Jones Malaysia Titans 25 Index (DJMY25) had a negative and significant effect on the Indonesian Sharia Stock Index (JKISSI) in the long term. This implies that changes in DJMY25 had a noticeable and negative impact on JKISSI over an extended period. However, the research also indicated that in the short term, DJMY25 did not have a significant effect on the Indonesian Sharia Stock Index (JKISSI). This suggests that the influence of DJMY25 on JKISSI was not immediately apparent and may have only become significant over a more extended time frame. These findings highlight the importance of considering both short-term and long-term dynamics in understanding the relationships between stock indices. Gunawan and Cahyadi, 2019 found the result that Indonesia make cooperate of commerce associate with other countries in Asian then Indonesia capital market has significant effect from Asian capital market. Mongi, 2019 the main findings confirm the existence of a long-term relationship for the DJIM emerging market index compared to the developed country index.

The analysis indicates that the DJIMTR variable has a significant negative long-term impact on JKISSI. The coefficient value for DJIMTR is -0.019476, which offers insights into their relationship. Specifically, a 1% increase in the Sharia stock price index at DJIMTR corresponds to a decrease of approximately 0.019476% in the Sharia stock price index of JKISSI. Conversely, a 1% decrease in the Sharia stock price index at DJIMTR results in an increase of approximately 0.019476% in the Sharia stock price index of JKISSI. This information illustrates the magnitude of the impact of changes in DJIMTR on JKISSI, showing a negative relationship in the long term between these two variables. According to Nawatmi, 2016 Economic globalization will remove all boundaries and barriers to the flow of capital, goods and services. Markets and production between countries became interdependent due to the growth of international trade.

The analysis indicates that DJCHK also has a significant negative long-term impact on JKISSI, with a coefficient value of -0.097001, providing insights into their relationship. Specifically, when the Sharia stock price index at DJCHK increases by 1%, JKISSI responds with a decrease of approximately 0.097001% in the Sharia stock price index. Conversely, if the Sharia stock price index at DJCHK decreases by 1%, JKISSI responds with an increase of approximately 0.097001% in the Sharia stock price index.

This result aligns with the findings of a test conducted by Prianto and Darwanto, 2021 which also found a significant negative effect of DJCHK on JKISSI in the long term. Conversely, the DJMY25 variable has a significant positive long-term effect on JKISSI, with a coefficient value of 0.838970. This coefficient value suggests that when there is a 1% increase in the Sharia stock price index at DJMY25, JKISSI will respond with an increase in the Sharia stock price index by approximately 0.838970%. Similarly, if there is a 1% decrease in the Sharia stock price index at DJMY25, JKISSI will respond with a decrease in the Sharia stock price index by approximately 0.838970%. These results shed light on the relationships between these variables and demonstrate the direction and magnitude of their effects on JKISSI.

DJIMTR and DJCHK showed a significant negative influence on JKISSI, while DJMY25 had a significant positive influence on JKISSI. The mitigation can be carried out by the relevant parties as a suggestion is Encourage investors to diversify their portfolios beyond just DJIMTR and DJCHK. This can reduce the negative impact of these indices on JKISSI by spreading risk across different asset classes and geographic regions or Encouraging investors to diversify their portfolios by allocating funds to various investment instruments that are less affected by DJIMTR and DJCHK. This could include stocks from other sectors or off-market investments closely related to DJIMTR and DJCHK. Conduct educational programs to inform investors about the potential risks associated with DJIMTR and DJCHK and the benefits of diversification. This can help investors make more informed decisions and reduce their exposure to negative influences. So continuously monitor the performance and correlation of DJIMTR, DJCHK, and DJMY25 with JKISSI.

Engage financial experts and investment consultants who have a deep understanding of financial markets and these indices to provide more accurate and timely advice to investors or Conduct regular analysis to identify changing trends and adjust mitigation strategies accordingly. While, DJMY25 had a significant positive influence on JKISSI so the suggestion is encouraging investors to pay more attention to investing in DJMY25 as part of their portfolio. This can be done through marketing and outreach campaigns that educate investors about the benefits and growth potential of DJMY25. Carry out continuous monitoring of DJMY25's performance and analyze the factors that influence its growth. In-depth analysis can help in identifying trends and better investment opportunities. By implementing these mitigation strategies, relevant parties can help reduce the negative impact of DJIMTR and DJCHK while leveraging the positive influence of DJMY25 on JKISSI, ultimately enhancing the overall performance and stability of investments.

To strengthen the integration of sharia capital markets in the long term and support stability and economic growth in relevant countries, the government can issue regulations that strengthen the legal and institutional framework for sharia capital markets, including regulations that facilitate cross-border trade, foreign investment and international cooperation. Islamic financial institutions. Investments in financial technology infrastructure, such as online trading platforms and payment systems based on blockchain technology, can increase the efficiency, transparency and inclusiveness of Islamic capital markets. These policies, if implemented effectively, can help strengthen the integration of Islamic capital markets in the long term and make a significant contribution to economic stability and growth in the countries concerned

The short-term VAR/VECM estimation results presented in Table 6 indicate that the DJIMTR, DJCHK, and DJMY25 variables do not have a significant impact on the JKISSI Sharia stock price index in the short term. This observation is consistent with the findings of a study conducted by *ibid.* this conclusion aligns with the notion that DJCHK and DJMY25 do not impact JKISSI in the short term. These results further suggest that investors who allocate their investments to Islamic stocks typically adopt a long-term investment approach, with the objective of realizing returns over time, rather than engaging in short-term trading or speculative activities. It suggests that the factors represented by DJIMTR, DJCHK, and DJMY25 have limited impact on the short-term fluctuations of the JKISSI index and are not considered significant drivers in the immediate trading decisions of investors. According to Al Rahahleh, Akguc, and Abalala, 2021 that DJI companies are more profitable than non-DJI companies during the sample period. Additionally, the profitability of DJI companies was less affected during the financial crisis than non-DJI companies.

3.7. Impulse Response Function (IRF)

The Impulse Response Function (IRF) is a technique employed to study how an endogenous variable responds to a specific shock in a time series model, particularly within the framework of vector autoregression (VAR) or vector error correction models (VECM). The purpose of the IRF is to examine how a variable responds, both in the short term and long term, to shocks or innovations in other variables within the system (Was' an, 2022). Figure 3 illustrates the response of JKISSI to shocks from various variables over different periods. The response of JKISSI to these shocks' alternates between negative and positive values in different time periods.

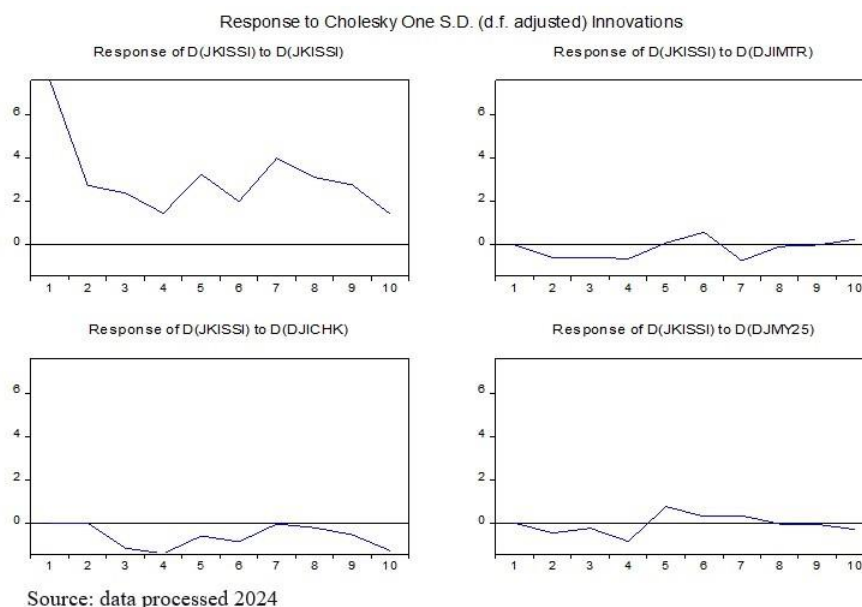


Figure 4. Impulse Response Function Test Results.

For instance, in the second period, JKISSI responded negatively to the DJIMTR shock, with a decrease of 0.58%, and this negative response continued into the third period with a decrease of 0.56%. However, JKISSI responded positively in the fourth period with

an increase of 0.64%. In contrast, in the 5 period, JKISSI exhibited a positive response to DJIMTR shocks, showing an increase of 0.09%, and this positive response continued into the sixth period with an increase of 0.59%. In the tenth period, JKISSI also responded positively, with an increase of 0.26%. On the other hand, Figure 4.5 shows that JKISSI consistently responded negatively to DJICHK shocks from the first period to the last period. For example, in the third period, the response was a negative decrease of 1.16%, followed by an increase in the fourth period (1.4%), and a decrease in the fifth period (0.59%). In the last period (tenth), JKISSI still responded negatively, with a decrease of 1.27%. These figures provide insights into the dynamic response of JKISSI to shocks from different variables over time.

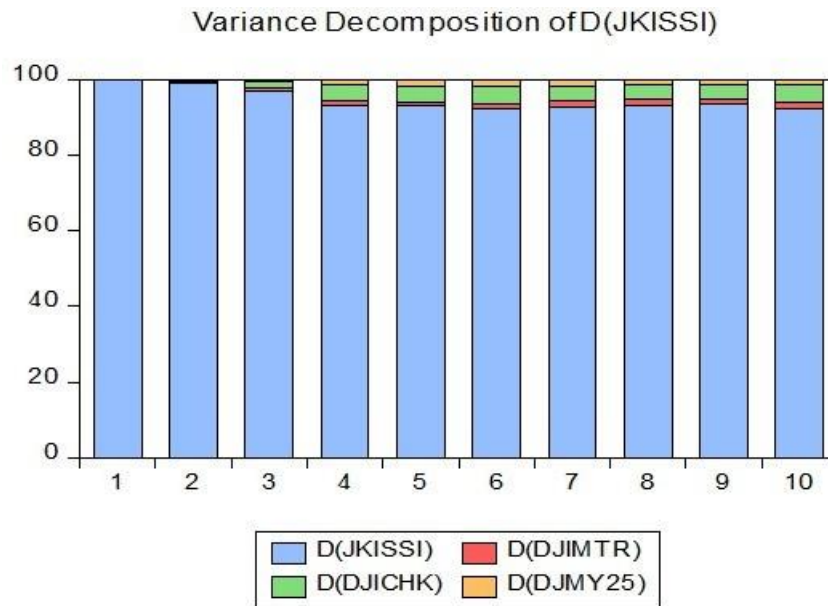
The response of the Indonesian Sharia Stock Index (JKISSI) to the shocks of the Dow Jones Islamic Market Index Malaysia (DJIMY25) exhibits a varied pattern over different time periods. In the second period, JKISSI responded with a negative change of 0.45%. This negative response continued into the third period with a decrease of 0.24%. However, JKISSI responded positively in the fourth period with an increase of 0.85%. In the fifth period, JKISSI experienced a positive response, with an increase of 0.76%. This positive response was followed by a decrease to 0.31% in the sixth period, and then it rose again by 0.34% in the seventh period. The response turned negative in the eighth period, and in the last period, it increased by 0.29%. These findings illustrate the dynamic response of JKISSI to shocks from DJIMY25 over different time periods, reflecting the complex interactions between the two variables.

3.8. Forecasting Error Variance Decomposition (FEVD)

The method used to predict the contribution of each research variable to shocks or changes in other specific variables within a model is called Impulse Response Function (IRF). It helps to understand how shocks in one variable propagate through the system and affect other variables over time. The results of FEVD provide insights into the relative importance of each variable in explaining the variability in the system (Novia, Zuliensyah, and Nurmalia, 2021).

Figure 5 illustrates the contributions of shocks from various variables to fluctuations in the Indonesian Sharia Stock Index (JKISSI) over different time periods. In the first period, the fluctuations in JKISSI were mainly caused by a 100% shock to JKISSI itself, indicating that JKISSI had a dominant influence on its own fluctuations during that time. From the second to the tenth period, the contributions of shocks from other variables, including DJIMTR, DJICHK, and DJMY25, began to affect JKISSI. In the second period, the shock to JKISSI caused by the JKISSI variable itself still dominated, accounting for 99.18% of the total shock. However, the contributions of other variables started to play a role, with DJIMTR contributing 0.5%, DJICHK contributing 0.3%, and DJMY25 also contributing 0.3% to the shocks in JKISSI during that period. These findings provide valuable insights into the dynamics of shocks and their impact on JKISSI over time, showing how different variables influence its fluctuations. According to Antar & Alahouel (2020), everything can be seen from the relationship of shocks that occur between the Islamic capital market or conventional stock market, and between the Islamic capital market and various economic and financial shocks.

In the sixth period, the shock to the Indonesian Sharia Stock Index (JKISSI) caused by JKISSI itself decreased to 92.14%, but it still dominated the overall shock to JKISSI



Source: data processed 2024

Figure 5. Test Results Forecasting Error Variance Decomposition.

during that period. The contributions of other variables increased, with DJIMTR contributing 1.48%, DJICHK contributing 4.64%, and DJMY25 contributing 1.74% to the shocks in JKISSI. In the last period, which is the tenth period, the shock from JKISSI itself continued to dominate, accounting for 92.33% of the total shock affecting JKISSI. The contributions of other variables in influencing the shock to JKISSI were limited, with DJIMTR contributing 1.5%, DJICHK contributing 4.77%, and DJMY25 contributing 1.39%. These results indicate that while JKISSI had a significant influence on its own fluctuations throughout the analysis period, the contributions of other variables, especially DJICHK, became more pronounced in influencing the shocks to JKISSI in the later periods. This suggests a dynamic relationship between these variables in the short term.

4. Conclusions

The long-term VECM model results reveal that the Dow Jones Islamic Market Turkey Index (DJIMTR) and Dow Jones Islamic Market China/Hong Kong Titans 30 Index (DJICHK) have a noteworthy adverse effect on the Indonesian Islamic Stock Price Index (JKISSI). Conversely, the Dow Jones Islamic World Malaysia Titans 25 Index (DJMY25) has a significant positive influence on JKISSI. On the other hand, in the short term, the estimation results indicate that none of the variables, including DJIMTR, DJICHK, and DJMY25, have a substantial impact on the Indonesian Islamic stock price index (JKISSI). However, JKISSI itself has a significant negative effect on DJIMTR and DJMY25 with a lag of five periods, while it has a notably positive impact on DJMY25 with a lag of one period. These results suggest that while there are significant long-term relationships between these variables, in the short term, their influence is not as pronounced, and JKISSI has a more immediate impact on DJIMTR and DJMY25. The

lagged effects also indicate that changes in DJIMTR and DJMY25 have a delayed impact on JKISSI.

The Suggestion for Investors who are interested in the Islamic stock market, consider diversifying their portfolio by including shares from indices that have a positive influence, such as DJMY25. This can help reduce the risks associated with certain market fluctuations. If you have a long-term investment outlook, consider maintaining your exposure to negative impact indices such as DJIMTR and DJCHK, with a diversification strategy that includes positive impact indices. Carry out further analysis regarding the factors that influence the correlation between these indices. Political, economic or regulatory changes in each country can have a significant impact on the performance of the Islamic stock market. This study only uses Islamic stock price index variables in four different countries using the Vector Error Correction Model (VECM) method in the period from January 2016 to May 2022. This research can be expected to provide accurate information about analyze the effect in short-term and long-term of the relationship between Turkey, China, and Malaysia Sharia Stock Index and Indonesian Sharia Stocks Index. For the next researcher, you can try to create a model in different period and you can use another method to process the data, add more variables from other countries Islamic stock exchanges.

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