

COINTEGRATION AND CONTAGION EFFECT CONVENTIONAL AND SHARIA STOCK INDICES DURING COVID-19

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Abstract

The COVID-19 pandemic has also affected stock price movement all over the world, along with the changes in the economic sector. Many studies have tried to reveal the integration of stock indices worldwide, but little show the Sharia Indices' movement due to the COVID-19 pandemic. This study analyzes the cointegration and contagion effect during the pandemic on Conventional and Sharia stock indices in Asia Pacific, China, Malaysia, and Indonesia. This study explores the difference between Sharia and Conventional indices during the COVID-19 pandemic. VAR (Vector Autoregressive) and VECM (Vector Error Correction Model) were used to analyze the hypothesis with E-Views 12. The data used in this study was the closing date from each index from 1 July 2018 to 30 June 2022. This study showed no cointegration effect between Sharia indices during the pandemic, but there was a cointegration effect on Conventional indices. During the pandemic, there was a contagion effect on both Shariah and Conventional indices. The results of this study are expected to be a reference basis for promoting the Sharia Stock Market because it is more proven in dealing with crises than the Conventional Stock Market.

Keywords: *Cointegration; Contagion Effect; Covid-19; Sharia Indices, Conventional Indices*

Abstrak

Pandemi COVID-19 juga mempengaruhi pergerakan harga saham di seluruh dunia, seiring dengan perubahan di sektor perekonomian. Banyak penelitian yang mencoba mengungkap integrasi indeks saham di seluruh dunia, namun hanya sedikit yang menunjukkan pergerakan Indeks Syariah akibat pandemi COVID-19. Penelitian ini menganalisis efek kointegrasi dan penularan selama pandemi pada indeks saham Konvensional dan Syariah di Asia Pasifik, Tiongkok, Malaysia, dan Indonesia. Studi ini mengeksplorasi perbedaan antara indeks Syariah dan Konvensional pada masa pandemi COVID-19. VAR (Vector Autoregressive) dan VECM (Vector Error Correction Model) digunakan untuk menganalisis hipotesis dengan E-Views 12. Data yang digunakan dalam



penelitian ini adalah tanggal penutupan masing-masing indeks mulai 1 Juli 2018 hingga 30 Juni 2022. Penelitian menunjukkan tidak ada efek kointegrasi antar indeks syariah selama pandemi, namun terdapat efek kointegrasi pada indeks konvensional. Selama pandemi, terjadi contagion effect pada indeks syariah dan konvensional. Hasil penelitian ini diharapkan dapat menjadi acuan untuk memajukan Pasar Saham Syariah karena lebih terbukti dalam menghadapi krisis dibandingkan Pasar Saham Konvensional.

Kata Kunci: Kointegrasi; Efek Penularan; COVID-19; Indeks Syariah, Indeks Konvensional

INTRODUCTION

The COVID-19 pandemic that broke out at the end of 2019 has entered its third and changed many aspects of human life (Şeker, 2022; Almarayeh, 2023). COVID-19 does not only affect aspects of human health but also affects some aspects such as the economy, politics, tourism, and sports. The economic sector is inseparable from the impact of the COVID-19 pandemic, both in the real and non-real sectors. The retail and non-retail trade sectors, which began to grow in early 2019, were significantly impacted by the pandemic that hit many companies and laid off employees (Martaliah et al., 2020).

This condition is similar to the Indonesian capital market, which developed rapidly in early 2020 and strengthened until February 2020. However, in early March 2020, the Jakarta Composite Index (JKSE) had fallen by 13.44% (Selasi, 2020). It is inversely proportional to the performance of the Indonesian Islamic capital market, which is indicated by the perch of the Islamic stock index (ISSI, JII70, JII) in the top position. Before the pandemic, the Islamic stock index was in the bottom three positions, but as of March 2020, the three indexes skyrocketed to the top position with an average increase of 11.33% (Kenia, 2021).

The stability of the Islamic capital market, especially in Indonesia, has even strengthened due to several advantages of the Islamic capital market. Transactions that are lawful and clean from manipulative elements are one of the attractions of the Islamic stock market. In addition, in the transactions in the Islamic capital market, there is always an underlying asset in the real sector so that the impact is more tangible in encouraging economic growth. The various advantages of the Islamic capital market have made it an attractive choice for investors to invest their shares, especially during unstable economic conditions due to the COVID-19 pandemic.

Figure 1 shows the effects caused by the COVID-19 pandemic, especially in February 2020-July 2022, on the Indonesian stock index. The pandemic effect on the stock market and financial institutions have been well documented in the literature (e.g., Poretti & Heo (2022), Singh et al. (2020),

Cepni et al. (2019), Ganie et al. (2022)). The movement of several world exchanges, including the Asian region, was due to concerns about the impact of the COVID-19 pandemic on the world economy (Ganie et al., 2022). It indicates that there is a relationship, both short-term and long-term, in the economic sector and suggests a contagion effect between these countries.

The contagion effect between capital markets in the world is inseparable from globalization, which increasingly increases the level of relations between countries (Cheng, et al., 2023; Rinaldo & Puspita, 2021). The contagion effect indicates that the financial situation of a country is strongly influenced by international economic conditions, especially for developing countries (Novianti, 2022). The contagion effect is also caused by opening a country's capital market to foreign investors. The contagion effect occurs due to the fading of boundaries between countries so that economic unification between countries arises (Lee, 2012).

This condition results in economic turmoil in a country, affecting other countries with relations with that country. It is in line with the theory that suggests the causes of index movements in the capital market: 1) From the supply side, the number of shares is too much compared to the demand; 2) Tight money policy, accompanied by high-interest rates on the money market, played a significant role in sucking up stock exchange activity and transferring excess liquidity to the money market; 3) External and foreign factors, such as the shadow of a world recession due to the Gulf crisis. The soaring oil prices and the hit to the western domestic economy, especially the United States, have caused fluctuations decline in stock price indexes, such as Wall Street in New York, and Tokyo (Nikkei) to Hong Kong (Hang Seng) in Singapore and Kuala Lumpur (Supranto, 2004).



Figure 1. The movement of the JCI, JII, KLSE, and DJICHK stock price indices for the period January 2020-July 2022
Source: Yahoo Finance (2022)



Several studies have been conducted to prove the long-term relationship (cointegration) and the contagion effect between capital markets. Research conducted by Hsien-Yi Lee explains the contagion effect due to the crisis in America in 2008. The results show a contagion effect of the 2008 American crisis on the capital markets of several countries such as Hong Kong, Taiwan, Australia, and New Zealand (Lee, 2012). Meanwhile, a research found that there was no cointegration relationship between the Islamic stock market in the pre-crisis period (15 February 2006- 25 July 2007) and the period during the crisis (26 July 2007-31 December 2008) (Karim et al., 2011). Other research regarding the impact of the COVID-19 pandemic on stock markets, revealed that the pandemic was associated with similar volatility levels in both stock markets (Hasan et al., 2021, Ghazali, 2022).

Furthermore, during the pandemic period, it appears that the Islamic index has higher volatility than other indices, although it demonstrates superior efficiency in terms of performance (Hidayah & Swastika, 2022; Ali et al, 2023). Research on integrating the Indonesian Islamic capital market with the capital markets of developing countries such as Turkey, Malaysia, Pakistan, and India was conducted by Budiandru et al. Research reveals the existence of cointegration or long-term effects between Islamic capital markets in developing countries (Budiandru et al., 2021).

Based on the various studies and theories described above, it can be concluded that there is an integration relationship and contagion effect between capital markets in the world as a result of the globalization process. However, there is still a research gap regarding the study results, which indicates that not all stock markets are affected by economic events. Apart from that, there is still a research gap in the results; previous research has not revealed the differences in cointegration and contagion effects between conventional and Islamic capital markets. Previous studies have primarily focused on examining the effects of a pandemic or crisis on a specific financial market, such as the Islamic capital market, limiting the scope of their analysis. Existing research on capital market integration is scarce, with a predominant focus on capital market volatility in the available studies. It needs to be done to prove the theory, which states that the Islamic capital market is more resistant to shocks and risks than the conventional capital market due to several things, one of which is that it carries out strict screening.

LITERATURE REVIEW

Economic globalization causes the level of relations between countries to increase and is no longer limited to space and time. It has an impact on investment activities, which can not only be done locally but also can be done on an international scale. From an investment perspective, the real benefit of



adding international securities is the additional benefit investors get through the potential risk reduction caused by differences in movements between stock markets (Jones, 2007). The concept of risk reduction through portfolio diversification is fundamental in investment.

Zhang Hengchao and Zarinah Hamid tried to examine the impact of the subprime crisis on the long-term and short-term dynamic relationship between the conventional stock market and the Islamic stock market. The results of this study reveal that in the period before the crisis, there was no significant relationship between Islamic stocks and conventional stocks. Meanwhile, this stock market has a long-term equilibrium relationship during a crisis, indicating that the capital market is integrated (Hengchao & Hamid, 2015). Based on the description of the theory and the results of previous research, the alternative hypotheses proposed in this study are:

H1: There is a cointegration between Islamic stocks during the COVID 19 pandemic

The main impact of the modern portfolio theory developed by Markowitz through portfolio management is the availability of various choices of securities that can be formed into a portfolio by considering the risk and return of each security. Before deciding to choose securities to be included in their portfolio, rational investors will collect various information about security prices to predict the return they will receive, including the risks that come with it. Information collected by investors consists of all information obtained, including the predictions price of these securities. Information is the key to determining the price of securities and is the central issue of the concept of an efficient market (Jones, 2007).

The cointegration test is one way to test the capital market efficiency hypothesis, first introduced by Granger in 1986. The assumption is that if prices in two capital markets have a cointegration relationship, it is possible to predict stock prices through prices on the previous day. In international financial markets, cointegration can arise due to market segmentation caused by national boundaries. The capital market is considered efficient if there is no cointegration relationship between the capital markets (Fu & Pagani, 2010).

H2: There is a cointegration between conventional stocks during the COVID-19 pandemic

Modern portfolio theory is the basis for investors in compiling their portfolios by knowing the interrelationships of returns between securities, which aims to calculate the portfolio risk and reduce portfolio risk to a minimum. It is important to know the interrelationships between securities



because the poor performance shown by some securities can lead to good performance for other securities over a certain period (Jones, 2007).

Residents in other countries can easily know the economic events in one country. Increasingly open economic relations between countries characterize economic globalization, so this causes the emergence of mutually influencing relationships between countries. The mutually influencing relationship between countries is called the contagion effect, which means that the turmoil in one country will affect other countries. For example, the COVID-19 pandemic affects not only China's economy but also other countries' economies. The findings of this study exhibit resemblance to previous research undertaken by (Miniaoui et al., 2015; Mishra, 2020), which supports the existence of a domino effect, also known as a contagion effect, among the Islamic stock markets under investigation during periods of economic distress.

H3: There is a contagion effect between Islamic stocks during the COVID-19 pandemic

The stock market was also affected by the economic turmoil that occurred, which was reflected in the weakening of the daily index on the stock market. If there is turmoil in one stock market within a certain time, then there is a possibility that it will affect other capital market conditions. Research conducted by Hsien-Yi Lee explains the contagion effect due to the crisis in America in 2008. Subprime mortgages affected the stock price movements of the countries studied (Lee, 2012). The study by Dimitriou and Simos (2013), Kho (2013), and Lee (2012) discovered evidence of a reciprocal relationship that suggests the presence of a contagion effect between conventional capital markets.

H4: There is a contagion effect between conventional stocks during the COVID-19 pandemic

METHOD

Sample and Data Sources

This research is a quantitative study with an observation period from July 2018 to July 2022. This study uses secondary data from time series data with daily data from data sources, such as the S&P Dow Jones website (S&P Dow Jones Indices (spglobal.com)). The research population includes the world's Islamic and Conventional Indices (Table 1).

The sample of this research is the closing price from each index on the stock exchange. The sharia indices were chosen based on the activeness of each still active index and the fairly strict screening process carried out by each index. Stock indices in these countries are selected based on the consideration



that these countries have a fairly strong economic relationship with China, the first country to be affected by the pandemic

Table 1. Country and Stock Indices

Country	Syariah Index	Simbol	Conventional Indeks	Symbol
Asia Pasifik	Dow Jones Islamic Market Asia Pasific	DJIAP30	S&P Asia Pasific BMI	SPAP
China	Dow Jones Islamic Market China	DJI CHKTIT	S&P China	SP China
Indonesia	Jakarta Islamic Index	JII	Jakarta Stock Exchange Composite Index	JKSE
Malaysia	Dow Jones Index Malaysia	DJIMY 25D	FTSE Bursa Malaysia KLCI	KLCI

Source: S&P Dow Jones Indices (2022)

Data Analysis

The analytical methods used in this research are the Vector Auto Regression (VAR) and Vector Error Correction Model (VECM) methods. VAR is used to analyze data if the data used is stationary at the level (Helmy et al., 2019; Hafidh, 2021; Agarwalla, 2021). Meanwhile, for data that is not stationary at the level, it is analyzed using VECM (Lee & Rhee, 2022; Wang, 2022; Malik & Velan, 2019). The difference in data analysis methods is intended to avoid spurious regression phenomena or false regressions arising from the regression of non-stationary variables. In this study, the author will analyze the data using the EViews econometric program equipped with its interpretation. The relationship in this study can be modeled into eight equations (1-8) below:

$$\begin{aligned}
 DJIAP_t &= \beta_1 + \sum_i^2 \beta_t DJIMY + \sum_i^2 \beta_t DJCHK + \sum_i^2 \beta_t JII + \sum_i^2 \beta_t DJIAP_{t-1} + \epsilon_t & (1) \\
 DJICHK_t &= \beta_3 + \sum_i^2 \beta_t DJIAP + \sum_i^2 \beta_t JII + \sum_i^2 \beta_t DJIMY + \sum_i^2 \beta_t DJCHK_{t-1} + \epsilon_t & (2) \\
 JII_t &= \beta_4 + \sum_i^2 \beta_t DJIAP + \sum_i^2 \beta_t DJCHK + \sum_i^2 \beta_t DJIMY + \sum_i^2 \beta_t JII_{t-1} + \epsilon_t & (3) \\
 DJIMY_{25t} &= \beta_5 + \sum_i^2 \beta_t DJIAP + \sum_i^2 \beta_t DJCHK + \sum_i^2 \beta_t JII + \sum_i^2 \beta_t DJIMY_{t-1} + \epsilon_t & (4) \\
 SPAP_t &= \beta_6 + \sum_i^2 \beta_t SPChina + \sum_i^2 \beta_t KLCI + \sum_i^2 \beta_t JKSE + \sum_i^2 \beta_t SPAP_{t-1} + \epsilon_t & (5) \\
 SPChina_t &= \beta_8 + \sum_i^2 \beta_t SPAP + \sum_i^2 \beta_t KLCI + \sum_i^2 \beta_t JKSE + \sum_i^2 \beta_t SPChina_{t-1} + \epsilon_t & (6) \\
 JKSE_t &= \beta_9 + \sum_i^2 \beta_t SPAP + \sum_i^2 \beta_t SPChina + \sum_i^2 \beta_t KLCI + \sum_i^2 \beta_t JKSE_{t-1} + \epsilon_t & (7) \\
 KLCI_t &= \beta_{10} + \sum_i^2 \beta_t SPAP + \sum_i^2 \beta_t SPChina + \sum_i^2 \beta_t JKSE + \sum_i^2 \beta_t KLCI_{t-1} + \epsilon_t & (8)
 \end{aligned}$$

Explanation:

- β = constant
- $DJIAP_t$ = closing price Asia Pacific Islamic market.
- $DJICHK_t$ = closing price China Islamic market.
- JII_t = closing price Indonesia Islamic market.
- $DJIMY_t$ = closing price Malaysia Islamic market.
- $SPAP_t$ = closing price Asia Pacific Conventional market.
- $SPChina_t$ = closing price China Conventional market.



IHSG_t = closing price Indonesia Conventional market.
 KLCI_t = closing price Malaysia Conventional market
 ε_t = error.

RESULTS

Granger Causality Test for Sharia Indices and Conventional Indices

Based on determining the lag in the previous stage, the optimum lag selected for Islamic indices during the COVID-19 pandemic was lag 5, so the Granger causality test will be carried out at lag 5. Table 2 reveals one causality or mutual influence between DJIMY and DJICHK. Some variables have a unidirectional relationship with other variables, meaning that statistically, these variables affect other variables but not vice versa.

Table 2. Granger Causality Test of Sharia Indices

Null Hypothesis	Obs	F-Statistic	Prob.
DJI_DJIMY does not Granger Cause DJI_DJICHK	1127	3.364	0.005
DJI_DJICHK does not Granger Cause DJI_DJIMY		0.972	0.003
DJIAP does not Granger Cause DJI_DJICHK	1228	0.795	0.553
DJI_DJICHK does not Granger Cause DJIAP		3.679	0.002
JII does not Granger Cause DJI_DJICHK	1077	0.329	0.895
DJI_DJICHK does not Granger Cause JII		1.655	0.142
DJIAP does not Granger Cause DJI_DJIMY	1127	0.803	0.546
DJI_DJIMY does not Granger Cause DJIAP		2.585	0.024
JII does not Granger Cause DJI_DJIMY	1070	1.307	0.258
DJI_DJIMY does not Granger Cause JII		2.406	0.035
JII does not Granger Cause DJIAP	1077	6.831	3.006
DJIAP does not Granger Cause JII		1.668	0.139

Source: Author Analysis (2022)

Table 3. Granger Causality Test of Conventional Indices

Null Hypothesis	Obs	F-Statistic	Prob.
KLCI does not Granger Cause JKSE	1015	3.437	0.004
JKSE does not Granger Cause KLCI		3.357	0.005
SP_AP does not Granger Cause JKSE	1077	2.868	0.014
JKSE does not Granger Cause SP_AP		9.375	9.009
SP_CHINA does not Granger Cause JKSE	1077	0.301	0.912
JKSE does not Granger Cause SP_CHINA		0.560	0.730
SP_AP does not Granger Cause KLCI	1059	0.871	0.499
KLCI does not Granger Cause SP_AP		5.987	2.005
SP_CHINA does not Granger Cause KLCI	1059	0.900	0.480
KLCI does not Granger Cause SP_CHINA		0.636	0.672
SP_CHINA does not Granger Cause SP_AP	1228	2.475	0.030
SP_AP does not Granger Cause SP_CHINA		2.719	0.018

Source: Author Analysis (2022)

Based on determining the lag in the previous stage, the optimum lag selected for conventional Indices during the COVID-19 pandemic was lag 5, so the Granger causality test will be carried out at lag 5. Table 3 reveals one



causality or mutual influence between DJIMY and DJICHK. Some variables have a unidirectional relationship with other variables, meaning that statistically, these variables affect other variables but not vice versa.

Cointegration Test

Based on Table 4, the cointegration test for sharia indices during the COVID-19 pandemic, it can be seen that the trace statistic value is smaller than the critical value, which indicates that there is no significant cointegration at = 5%. It shows there cannot be a cointegration effect between Islamic indices during the pandemic. Furthermore, from the results of this cointegration test, it can be determined that the VAR in difference model will be used for Islamic indices during the COVID-19 pandemic for further analysis.

Based on the cointegration test for conventional (Table 5) indices during the COVID-19 pandemic, it can be seen that the trace statistic value is bigger than the critical value, which indicates that there is a significant cointegration at = 5%. It shows a long-term balance relationship between conventional stocks during the pandemic. Furthermore, from the results of this cointegration test, it can be determined that the VECM in difference model will be used for conventional stocks during the COVID-19 pandemic for further analysis.

Table 4. Cointegration Test for Sharia Indices

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.121	24.492	63.876	0.004
At most 1	0.045	18.525	42.915	0.362
At most 2	0.037	11.505	25.872	0.386
At most 3	0.014	1.654	12.517	0.624

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

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

Source: Author Analysis (2022)

Table 5. Cointegration Test for Conventional Indices

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.181	56.177	47.856	0.229
At most 1	0.087	31.685	29.797	0.664
At most 2	0.042	13.160	15.495	0.692
At most 3	0.008	1.654	3.841	0.329

Trace test indicates no cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

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

Source: Author Analysis (2022)

**Table 6. VAR Test for Sharia Indices and VECM Test for Conventional Indices**

VAR		VECM	
Variable	Influenced By	Variable	Influenced By
D (JII)	None	D(KLSE)	D(SPCHINA), D(SPAP) D(SPCHINA (-1)), D(SPAP(-1))
D (DJIAP)	D (DJIAP (-1))	D(SPCHINA)	D(SPCHINA), D(SPAP) D(SPCHINA (-1)), D(SPAP(-1))
D (DJICHK)	D (DJICHK (-1))		D(SPCHINA), D(SPAP) D(SPCHINA (-1)), D(SPAP(-1))
D (DJIMY)	None		D(SPCHINA), D(SPAP) D(SPCHINA (-1)), D(SPAP(-1))

Source: Author Analysis (2022)

From table 6, for VAR test of Sharia Indices, it can be seen that not all variables significantly influence the movement of other variables. In the first equation, the movement of the JII index is not statistically influenced by other indices, as well as the movement of the DJIMY variable, which is not statistically affected by other variables (Eq. 4). The movement of the DJIAP variable was significantly affected by the price of the DJIAP index itself on the previous day, while other variables, such as JII, DJICHK, and DJIMY, did not significantly affect the movement of the DJIAP. Equation four shows that the DJICHK variable significantly positively influences the movement of DJICHK on the previous day, and other variables have no significant effect.

In other ways, the cointegrating vector estimation results for conventional Indices by VECM in the four equations above show that SPCHINA (0.458) and SPAP (-212.148) significantly affect the cointegrating vector. That means the SP CHINA and SP AP indexes contributed significantly to the long-term relationship with the KLSE and JKSE indexes during the pandemic. From these four equations, the speed of adjustment coefficient on the cointegrating vector for SPCHINA is -0.429, statistically significant. It means that when there is a disequilibrium condition in the short term to the long term balance, the SPCHINA will adjust negatively by 0.429.

DISCUSSION

The first hypothesis states a cointegration or long-term relationship exists between Islamic stocks during the COVID-19 pandemic. The first hypothesis is answered by comparing the value of the t-trace statistic with the statistical value. Sharia stocks are said to have a long-term relationship if the t-trace statistic is more than critical value. Based on the cointegration test that has been carried out, the results show that the t-trace statistic value (44.13) less than critical value (47.85), so that means H0 is rejected and the equation is cointegrated.



It means that the results obtained are not cointegrated between Islamic stocks, so the first hypothesis is rejected. The results of this hypothesis test align with the research regarding the integration of the Islamic capital market during the subprime crisis. The study's results stated that the 2007 financial crisis did not affect the long-term relationship between the Islamic capital market (Karim et al., 2011). Another research proves that the Islamic Asia Pacific index and Emerging Markets were unaffected by the speculative impact of the 2008 global crisis (Arshad & Rizvi, 2013). Research results additional reference regarding the superiority of the Islamic capital market, namely, the Islamic capital market can provide opportunities for potential profits through international portfolio diversification (Karim et al., 2011). One of the reasons supporting this study's findings is the prohibition of *riba'*, *gharar*, and *maysir* in the Islamic capital market. In other words, the sharia index is considered more stable than the conventional index due to stricter screening criteria.

The cointegration test is one of the analyses used to test the market efficiency hypothesis; the market is considered efficient if there is no cointegration relationship between markets. The results of the study state that there is no cointegration between Islamic stock indices in China, Indonesia, Malaysia, and the Asia Pacific, so it can be said that the Islamic stock market in the region is included in the efficient category. Based on the market efficiency hypothesis, the absence of cointegration between markets indicates that stock price predictions in one country cannot be entirely based on information from stock prices in other countries (Arshad & Rizvi, 2013).

The absence of cointegration between the Islamic stock markets in these countries is caused, among others, by several factors, such as specific factors that exist in that country that are different from other countries or are called national constraints such as law. Another factor that can affect the absence of cointegration between Islamic capital markets is the uniqueness of the Islamic capital market, which must comply with Sharia principles, including the prohibition of *riba'*, *gharar*, *maysir*, and other restrictions (Aliani et al., 2022; Hkiri et al., 2017). There is no cointegration relationship between the Islamic stock market, causing investors to be less able to refer to Islamic stock prices in other countries as a benchmark for speculation on Islamic stock prices in that country. It is one of the additional points of the Islamic capital market because it can be a vehicle for investment diversification for investors.

The results of hypothesis testing show that after the cointegration test, the results are statistical; during China's economic turmoil, there was cointegration between conventional stocks. It can be seen from the trace statistic value (227.47) more than from the critical value (47.46) at the 5% significance level. Therefore, the second hypothesis, which states a



cointegration between conventional stocks during the COVID-19 pandemic, is accepted.

The COVID-19 pandemic has cointegrated conventional stock markets in Indonesia, Malaysia, China, and Asia-Pacific. This study's results align with some research (Chen & Woo, 2010; Karim et al., 2011). Cointegration relations in the capital market are getting stronger along with the occurrence of trade relations between these countries. Geographical proximity and close relations between countries also play a significant role in integrating these countries (Karim et al., 2011). The magnitude of the impact of the COVID-19 pandemic on countries in the Asia Pacific region, in particular, resulted when the COVID-19 pandemic occurred. Countries in the Asian region also felt the impact of the incident, which lasted for a long time. This cointegration occurs partly due to the close trade relations between these countries and factors of adjacent geographical conditions.

The third hypothesis states that there is a contagion effect between Islamic stocks during the COVID-19 pandemic. Hypothesis testing is done by looking at Granger causality if the method used is VECM and through Variance Decomposition if the VAR method is used. Based on the analysis, it can be concluded that there is a contagion effect between Islamic stocks during the COVID-19 pandemic, so the third hypothesis is accepted. The existence of a contagion effect between Islamic stocks can be seen from the significant changes in the contribution of each variable between the beginning of the period and the end of the period.

Based on the IRF analysis, almost all Islamic stocks are responsive to shocks that arise in other Islamic stocks. It means that when a shock or event causes the rise and fall of Islamic stock prices in one Islamic capital market, it also causes changes in Islamic stock prices in other Islamic capital markets. The response shown by Islamic stocks related to changes that occur in other Islamic stocks is quite large. Based on the analysis of Variant Decomposition (VD) of Sharia shares, it shows that of the four Sharia stock markets studied, namely DJIAP, DJICLK, DJIMY, and JII, in general, the Islamic stock market is almost dominated by DJIAP. DJIAP has a huge influence on DJICLK, reaching 46%, while for other Sharia stocks, the influence is around 13.9% for DJIMY and 24.6% for JII.

Geographical location and close trade relations are one of the causes of the contagion effect. The contagion effect is a contagious effect that occurs in other countries due to crisis. The contagion effect cannot be avoided because of international trade, and transmission due to the contagion effect will be higher due to rapid globalization. However, based on the analysis of research data that has been carried out for Islamic stocks, even when there is a shock, or in this case, the COVID-19 pandemic, the effect is not long. It is evidenced by

statistical analysis, which proves no long-term relationship between stocks. Sharia. There was a domino effect (contagion effect) between the Islamic stock markets studied during the COVID-19 pandemic (Al-Yahyaee et al., 2020; Ikrima & Muharam, 2015; Miniaoui et al., 2015).

The fourth hypothesis of this study is that there is a contagion effect between conventional stocks during China's economic turmoil. Hypothesis testing is done by looking at the results of Granger causality to see the mutual relationship because the method used is the VECM method. The results of the Granger causality test analysis revealed that, in general, the SP China index is dominant in influencing other conventional indices, especially the KLCI index and the JKSE.

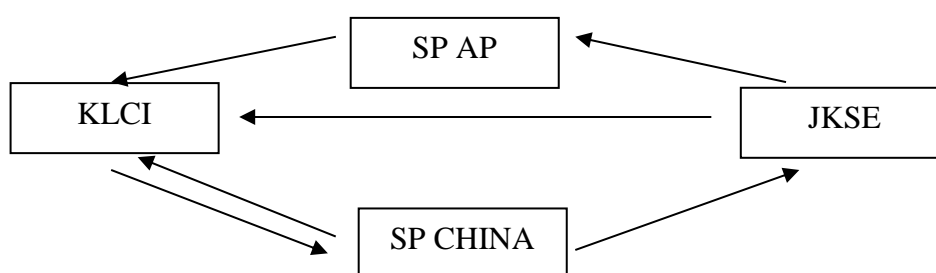


Figure 2. Granger Causality Test for Conventional Indices
Source: Author Analysis (2022)

Based on the analysis, it can be concluded that there is a contagion effect between conventional stocks during the COVID-19 pandemic, so the fourth hypothesis is accepted (Figure 2). The existence of a contagion effect between conventional stock markets (Lee, 2012; Dimitriou & Simos, 2013). These studies reveal a mutually influencing relationship, indicating a contagion effect between conventional capital markets. Most developing countries, capital markets will be easily affected when an economic event occurs in a country with a fairly strong economic position (Lee, 2012). The COVID-19 pandemic has affected other countries' economic conditions, especially those with fairly close trade relations with China, such as ASEAN countries. The study results reveal that the SP China stock index, as one of the stock indexes in China, affects the movement of the Indonesian (JKSE) index during the pandemic. It is due to the fairly strong trade relationship between China and Indonesia, so the fall in the SSE stock index also affected the rise and fall of the JKSE.

The results of the Granger causality test also show a mutually influencing relationship between the SP China and KLCI indices, which indicates a contagion effect during a pandemic. The two-way relationship or mutual influence between the SP China and KLCI indices occurs due to the



strong trade relationship between the two countries. In general, the contagion effect arises due to the globalization of the economy to create unlimited or unimpeded access for investors worldwide. Economic globalization has positive and negative impacts that must be considered. The positive impact of economic globalization is the opportunity for investors to diversify internationally for the investor market. Economic globalization also makes it easier for countries, especially developing countries, to increase the amount of foreign investment to support their country's economic development. Meanwhile, the negative impact of economic globalization is the contagion effect itself, so that economic events in a country can be quickly responded to by other countries, which can impact the country's economic condition directly or indirectly.

CONCLUSION

Based on the cointegration test, statistically, there is no cointegration between Islamic stocks during the pandemic, so H1 is rejected. The absence of cointegration between Islamic stock markets, based on the market efficiency hypothesis, makes the Islamic stock market a vehicle for investment diversification for investors. After the cointegration test has been carried out, the results obtained are statistically significant when there is cointegration between conventional stocks in a pandemic. Therefore, the second hypothesis, which states a cointegration between conventional stocks during China's economic turmoil, is accepted. The third hypothesis states a contagion effect between Islamic stocks during the pandemic. Hypothesis testing was done through Variance Decomposition because the VAR method was used to test the Sharia stock hypothesis. Based on the analysis, it can be concluded that there is a contagion effect between Islamic stocks during the economic pandemic, so the third hypothesis is accepted. The contagion effect is a contagious effect that occurs in other countries due to a crisis that occurs in a country, which is caused, among other things, by the geographical location and close trade relations between countries. The contagion effect will be higher due to the rapid globalization.

Based on the hypothesis test carried out statistically, there is a contagion effect between conventional stocks and COVID-19. Hypothesis testing is done by looking at the results of Granger causality to see the mutual relationship because the method used is the VECM method. The results of the Granger causality test analysis revealed that, in general, the SP China index is dominant in influencing other conventional indices, especially the KLCI index and the JKSE. It proves the fourth hypothesis that states a contagion effect exists between conventional stocks during the COVID-19 Pandemic.



It is anticipated that the findings of this study will aid investors in making sound investment decisions, particularly if they wish to invest in multiple countries and markets. Additionally, it is intended that the research findings would serve as a foundation for more aggressively pushing the Sharia stock market, which has shown to be more resilient to crises than traditional stock markets.

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