

Research Paper

The Corelation of Pandemic and Indonesia Presidency of G20 in The Capital Market G20 Member Countries

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Abstract

The correlation between the capital market of G20 member countries is important to analyze. Depending on a country's economy, capital market integration may have different effects. A more intense bilateral relationship (trade intensity) can significantly affect the movement of capital market shares between countries. The current research used the Multivariate GARCH Model/DCC-GARCH method. The condition of capital market integration before the Indonesian G20 Presidency showed that Indonesia (JKSE) had the strongest integration with Australia (ASX) (0.563814) and South Korea (KOSPI) (0.542470). After the G20 presidency, Indonesia (JKSE) had the strongest capital market integration with India (NSE) (0.507229) and the USA (NYSE). It was also found that China (SSE) had an integration with South Korea (KOSPI), while Germany (DAX) and Australia (ASX) had an integration with the UK (FTSE100). The conclusion is that the higher autocorrelation, the higher the effect of the volatility of stock market movements in the two countries involved. Furthermore, capital market integration can be influenced by geospatial and economic relations.

Keywords: DCC, GARCH, G20, Integration

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1. Introduction

Indonesia held the Group of Twenty (G20) presidency from 30 November 2022 to 1 December 2021. The G20 forum is an international forum that coordinates economic and development policies. This forum represents the world's economic and political power, as its composition covers 80% of the global GDP, 75% of global exports, and 60% of the global population. It is established to ensure that the world can arise from crises and develop strong, sustainable global economic growth. The G20 consists of nineteen countries and one region: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Korean Republic, Mexico, Russia, Saudi Arabia, South Africa, Turkey, England, USA, and the European Union. In the Indonesian presidency, the theme of the forum was "Recover Together, Recover Stronger," emphasizing the efforts to rise from the COVID-19 pandemic.

The stock market price of a country may be highly fluctuating and cause transmission from one country's capital market to another country. The fluctuating market price of a country could be caused by co-movement volatility, which results in a spillover effect or asymmetric information transmission in the capital market. Fluctuating stock price movement is also affected by a country's macroeconomic conditions and global conditions. According to Wang & Guo (2020), capital market integration among countries may have different effects depending on a country's economic stability. A more intense bilateral relationship (trade intensity or economic cycles) may significantly affect the capital market stock movement among countries (Wang & Guo, 2020). According to Wang & Guo (2020), during an unstable economic condition due to crises, capital market correlation among countries becomes increasingly complex due to fundamental factors that cannot explain the market correlation among countries. The fundamental macroeconomic factors that may affect the capital market price include Gross National Product (GNP), interest rate, and exchange rate (Wongbangpo & Sharma, 2002).

According to Zhang et al. (2019), a crisis in developed countries may significantly affect developing countries. They further argued that the intensity of the co-movement may also be affected by spatial aspects. From a multidimensional spatial perspective, a strong relationship between countries may affect their integration and co-movement (Zhang et al., 2019). The COVID-19 pandemic in 2020 and 2021 has resulted in economic instability due to a supply-demand imbalance and restricted mobility of goods and services. A country's unstable capital market condition may significantly affect the risk transfer from one country to another due to the transfer of information. Capital market information is not only impacted by the fundamental aspects but also by the spatial, political, and economic relationships among regional organizations (Zhang et al., 2019).

The G20 forum is an international economic cooperation forum comprising the world's twenty largest economies (Wang & Guo, 2020). The total gross domestic product (GDP) of the G20 countries covers nearly 85% of the global economy (Wang & Guo, 2020). The G20 countries may considerably influence the global economy and international financial stability (Wang & Guo, 2020). The total value of the capital market of the G20 countries is known to represent 86% of the global capital market (Wang & Guo, 2020). The USA serves as a G20 country member with the largest stock market (40.55%), followed by China (11%), while Indonesia makes up only 0.66% of the global stock market.

In general, there are three explanation categories for the co-movement among different stock markets (Pretorius, 2002). First, the co-movement may be accounted for by the contagion effect, a part of the stock market's co-movement that could not be explained by economic fundamentals (Pretorius, 2002). The second category is economic integration, meaning that when two countries' economies are integrated, their stock market is likely to be dependent on each other (Pretorius, 2002). Economic integration is related to a trading relationship and the co-movement of economic indicators that may influence the stock market's return, such as interest rate and inflation (Pretorius, 2002). The third category includes the stock market characteristics that influence the degree to which two stock markets are dependent on each other, such as industry similarity, volatility, and market size (Pretorius, 2002).

Economic integration may reflect the interdependence between one country and another. A country's financial condition may be influenced by its policy, institutions, and market conditions. A capital market's movement integration process could be defined as changes in attribute (stock price) from one country to another due to the transfer of information. These changes could be in the form of different assets in the same sectors or the same assets in different sectors and regions. The global economy is

closely associated with the financial market and inter-region movements, which serve as one of the keys to an investment portfolio.

Unstable financial conditions like the 2008 global economic crisis may cause shock in the economic and financial market, in addition to the transmission of capital market movement. The global financial crisis due to the COVID-19 pandemic has resulted in an unstable global economic condition and financial market, which also led to the increased relevance of Socially Responsible Investment (SRI). The transfer of information and investment risk of certain assets or capital markets among countries may account for the increased SRI value. The investment risk could be seen in the capital market's volatility. During the financial instability due to the COVID-19 pandemic, investors need information and analysis to holistically evaluate various portfolio diversification strategies to help them minimize potential risks and improve their overall performance (Díaz et al., 2022). The integration of capital market movement between developing and developed countries is relatively low in normal conditions but may increase during the crisis (Wang & Guo, 2020). In this regard, increased integration may result in higher volatility. The significant increase in co-movement integration among countries during the crisis is also explained in the study conducted by Pretorius (2002). Stronger integration of a country's capital markets may be affected by the market's interrelationship (Pretorius, 2002).

From the macroeconomic perspective, two major economic variables affect capital markets' interdependence. First, the stronger the two countries' bilateral trading relationship, the higher the co-movement level of their capital markets. Second, macroeconomic variables like interest rates and inflation are also known to affect the capital market as these variables influence capital market yield. The correlation among these variables is likely to impact the relationship between countries' capital markets.

The G20 member countries also develop liberal economic and trade agreements in addition to their efforts in the post-COVID-19 pandemic recovery. A study on the relationship between trade and economic conditions in the capital market movement among developing countries was conducted by Beine & Candelon (2011). They reported a positive relationship between financial liberalization and capital market return integration (Beine & Candelon, 2011). Trade agreements may also increase the correlation between the involved countries (Beine & Candelon, 2011). Policy reform that influences the real and financial sectors in developing countries may significantly affect the financial investors' behavior. A previous study reported the important role of integration for policymakers in formulating the policy direction and appropriate intervention to the capital market, either in a stable condition or in a recession (Jiang et al., 2017). A stronger integration among capital markets is likely to decrease the global portfolio diversification benefits, while in certain cases, a higher correlation in a short period is likely to indicate a crisis period (Jiang et al., 2017).

The DCC model can predict capital market integration. Several studies have been conducted measuring the integration and spillover effects on the capital market. Trade and financial integration pathways can also contribute indirectly to domestic contagion during crises (Bekaert et al., 2011). The global crisis and potentially damaging consequences of contagion effects continue to attract the attention of economists and policymakers (Kenourgios et al., 2011). Policy responses to crises are unlikely to prevent dispersion among countries, creating fewer domestic risks that can be internationally diversified when it is most desirable (Kenourgios et al., 2011). Research related to COVID-19 made some important contributions to equity market participants and emerging market regulators (Kamaludin et al., 2021). The correlation between the ASEAN-5 equity market and the new daily COVID-19 is significantly positive with Dow Jones Industrial Average Index (DJIA) (Kamaludin et al., 2021). Research about the impacts of the COVID-19 pandemic showed that crude oil prices also affect macroeconomic conditions through their influence on monetary policy instruments, inflation, and other economic activities (Ali et al., 2022). Research about the condition correlation during a crisis implied that the investors and portfolio managers seeking portfolio diversification and hedging opportunities in a high-risk environment, such as the COVID-19 pandemic (Yildirim et al., 2022). Capital market correlation results in spillovers on commodity prices such as oil prices. The COVID-19 pandemic seems to have played a significant role in affecting the asymmetric impact of oil prices in both the short and long term (Baek, 2022). Other studies also mentioned that commodities that have an effect on spillover volatility include oil and gold (Mensi et al., 2022). The fact that the economic condition is very important implies that it is fundamental to implement policies to maintain supply and demand. Other studies also stated that economic conditions have a relationship between financial assets and commodity price volatility (Antonakakis et al., 2023). In

addition, the correlation is also related to the type of financial asset, the COVID-19 outbreak, and high-frequency information transmission between major cryptocurrencies (Yousaf & Ali, 2020).

2. Methodology

The samples of this study were closing prices in the G20 member countries. The data were processed in the form of returns to avoid the effect of currency risk. In this study, the closing price of the G20 member countries was presented in USD. The study was conducted before the Indonesian G20 Presidency (January 2020- 29 October 2021) and after the Indonesia Presidency (30 October 2021 - 22 April 2022). The samples in this study had the following criteria: 1) they were in the form of a comparison of the same conditions where the COVID-19 pandemic started, 2) they were emerging countries and developing countries sharing the same characteristics, 3) large sample data (daily closing prices) were used, 4) the first difference method to produce good and analyzable data (stationary/no unit root test). The present study was conducted during the COVID-19 pandemic and post-pandemic economic recovery period when Indonesia held the G20 Presidency to avoid other factors that potentially affected the study results. This study focused on the capital markets of the G20 member countries, including Indonesia, China, England, Australia, the USA, Brazil, Japan, Germany, South Korea, and India. The data were the capital markets' closing prices.

2.1 DCC-GARCH Model (1,1)

The Generalized Autoregressive Conditional Heteroskedasticity (GARCH (1,1)) was first introduced by Bollerslev (1986). The Multivariate GARCH model (1,1) was developed to make it more parsimonious; among the MGARCH (1,1) is the Dynamic Conditional Correlation (DCC-GARCH) model (Engle, 2002). DCC-GARCH (1,1) model was applied for the following reasons: 1) It allowed researchers to obtain coefficients for time-varying correlation and a cross-market conditional correlation through covariance matrix decomposition into conditional standard deviation matrix and correlation matrix; 2) it allowed researchers to understand the time-varying conditional pattern; 3) It provided a consistent estimate for conditional correlation matrix; 4) It did measure not only co-movements but also the level of co-movement among other countries. The following is the DCC-GARCH (1,1) model used in this study:

$$r_t = \gamma_0 + \gamma_1 r_{t-1} + \gamma_2 r_{t-1}^n + \varepsilon_t, \varepsilon_t \rightarrow N(0, H_t)$$

$$r_t = \gamma_0 + \gamma_1 r_{t-1} + \gamma_2 r_{t-1}^l + \varepsilon_t, \varepsilon_t \rightarrow N(0, H_t)$$

where r_{t-1} refers to a lagged return of n (current stock price index), and r_{t-1}^l represents lagged return of the benchmark stock index, H_t represents $k \times k$ matrix of conditional standard deviations for return series. D_t The matrix was obtained from Univariate GARCH (1,1) estimates (Bollerslev, 1986) where:

$$h_t = c_0 + \sum_{i=1}^q \alpha_i \varepsilon_{t-1}^2 + \sum_{i=1}^p \beta_i h_{t-i}$$

c_0 is the constant, while α_1 and β_1 are ARCH and GARCH (1,1) coefficients, respectively. The dynamic conditional correlation (Engle, 2002) was estimated in two stages: First, estimating the GARCH (1,1) parameter, and second, estimating the correlation. In this study, the DCC-GARCH (1,1) analysis technique was applied. The model measured the stock market correlation. The specific equation of DCC-GARCH (1,1) is presented as follows:

$$r_t | =_{t-1} \sim N(0, D_t R_t D_t)$$

$$D^2 t = \text{diag} \{ \omega_i \} + \text{diag} \{ K_i \} \circ r_{t-1} r_{t-1}^l + \text{diag} \{ \lambda_i \} \circ D_{t-1}^2$$

$$\varepsilon_t = D_{t-1}^2 r_t$$

$$Q_t = S \circ (\tilde{\gamma}' - A - B) + A \circ \varepsilon_{t-1} \varepsilon_{t-1} + B \circ Q_{t-1}$$

$$R_t = \text{diagonal } Q_t^{-1} Q_t \text{ diagonal } Q_t^{-1}$$

The log-likelihood is as follows:

$$L = -\frac{1}{2} \sum_{t=1}^T (n \log(2\pi) + \log |H_t| + r_t' H_t^{-1} r_t)$$

The model was formulated into asymptotic consistency and normality of parameters that met the requirements if parameter D were stated in θ . Log likelihood could be stated as the number of partial volatility and correlation of $L(\theta, \phi) = LV(\theta) + LC(\theta, \phi)$. The formula to measure the volatility is presented as follows: $(\theta) = -1/2 \sum (n \log(2\pi) + \log |Dt|^2 + rt D_t^{-2} rt)$. Components of correlation are as follows: $(\theta, \phi) = -1/2 \sum (\log |Rt| + \epsilon t R_t^{-1} \epsilon t - \epsilon t' \epsilon t)$. Thus, partial volatility represented the number of GARCH (1,1) likelihood of each individual sample.

$$LV(\theta) = -1/2 \sum_{t=1}^T \sum_{i=1}^n = 0(n \log(2\pi)) + \log(h_{i,t}) + r_{i,t}/h_{i,t}$$

The DCC-GARCH (1,11) model was also applied by Sugiyanto & Robiyanto (2021) to analyze the dynamic integration of the Indonesian capital market during the COVID-19 pandemic.

3. Results and Discussions

3.1 Capital Market Return Volatility before Indonesia G20 Presidency (January 2020 to 29 October 2021)

The present study used Augmented Dicky-Fuller to test the return unit root of each capital market issuer. The ADF results indicated that all variables (return) did not have unit roots, supporting valid estimates of integration between Indonesia and G20 member countries. The return of each capital market issuer had been in the stationary phase, indicated by the return volatility that was close to mean reversion. Based on the $\alpha + \beta < 1$ from GARCH (1,1) (before the G20 Indonesia Presidency), the $\alpha + \beta$ value showed that the values of India (NSE) and the USA (NYSE) were 0.99681 and 0.97800, respectively. The α value revealed short-term run persistence, while the β value showed long-run persistence. The highest α value was NYSE (0.396969), suggesting the presence of a short-term run. In other words, the stock risk was positively associated with the stock return of 0.396969 in a short-term period. Beta stock indicated a systematic risk level of stock toward the market risk. A stock beta value is divided into three: $\beta > 1$, meaning that the stock systematic risk is higher than the market's systematic risk; $\beta < 1$, meaning that the stock systematic risk is lower than the market's systematic risk; and $\beta = 1$, meaning that the stock systematic risk equals to the market systematic risk (Wang & Guo, 2020). The highest β value was found in Shanghai Stock Exchange (SSE) (0.859485), implying the presence of a short-term run, in which the stock risk had positive effects with a return of 0.859485 in a long-term period. A higher β value usually possesses a higher stock risk and offers a higher stock return.

Table 1: Descriptive Analysis of the Capital Market before the G20 Presidency of Indonesia

Stock Exchange		Mean	Skewness	Kurtosis	Log Likelihood
JKSE (Indonesia)	(1)	0.00031	-0.26772	10.57472	1220.940
SSE (China)	(2)	0.00089	0.22178	5.91620	1298.961
FTSE100 (England)	(3)	0.00026	-0.32481	15.48474	1206.304
ASX (Australia)	(4)	0.00060	-0.68806	11.76439	1210.201
NYSE (America)	(5)	0.00069	-0.65191	15.72384	1304.007
IBOV (Brazil)	(6)	-0.00040	-0.60494	11.22027	974.112
NIKKEI (Japan)	(7)	0.00061	0.16269	8.23321	1235.850
DAX (German)	(8)	0.00073	-0.54552	13.90793	1200.858
KOSPI (South Korea)	(9)	0.00100	0.07017	7.46314	1173.125
NSE (India)	(10)	0.00107	-0.72852	18.46656	1214.870

Table 2: GARCH Testing (before the G20 Presidency)

Stock Exchange		GARCH (1,1)			
		c	α	β	$\alpha+\beta$
JKSE (Indonesia)	(1)	0.001067	0.238803	0.667132	0.90593
SSE (China)	(2)	0.001058	0.084333	0.859485	0.94382
FTSE100 (England)	(3)	0.000380	0.175559	0.780025	0.95558

Stock Exchange		GARCH (1,1)			
		c	α	β	$\alpha+\beta$
ASX (Australia)	(4)	0.001053	0.246292	0.695520	0.94181
NYSE (America)	(5)	0.001320	0.396969	0.581030	0.97800
IBOV (Brazil)	(6)	0.000003	0.200675	0.695321	0.89600
NIKKEI (Japan)	(7)	0.001443	0.227315	0.617547	0.84486
DAX (German)	(8)	0.000890	0.172397	0.794890	0.96729
KOSPI (South Korea)	(9)	0.001522	0.198219	0.730077	0.92830
NSE (India)	(10)	0.001333	0.153965	0.842845	0.99681

3.2 After Indonesia's G20 Presidency (30 October 2021 to 22 April 2021)

The present study used Augmented Dicky-Fuller to test the return unit root of each capital market issuer. ADF result indicated that all variables (return) did not have unit roots, supporting valid estimates of integration between Indonesia and other G20 member countries. The return of each capital market issuer had been in the stationary phase, marked by return volatility that was close to mean reversion. Based on the $\alpha + \beta < 1$. from GARCH (1,1) (before the G20 Presidency of Indonesia), the $\alpha + \beta$ value showed that the values of England (FTSE100) and South Korea (KOSPI) were 0.99681 and 0.99349, respectively.

The highest α value was SSE (0.664075), indicating the presence of a short-term run. In other words, the stock risk was positively associated with the stock return of 0.664075 in a short-term period. Beta stock indicated a systematic risk level of stock toward the market risk. The highest β value was found in KOSPI (1.052791), indicating the presence of a short-term run, which means that the stock risk had positive effects with a return of 1.052791 in a long-term period. A higher β value usually possesses higher stock risk and offers a higher stock return.

Table 3: Descriptive Analysis of the Capital Market after PG20 Indonesia

Stock Exchange		Mean	Skewness	Kurtosis	Log Likelihood
JKSE (Indonesia)	(1)	0.00055	-1.32408	8.21951	458.006
SSE (China)	(2)	-0.00100	-1.18182	7.41097	427.176
FTSE100 (England)	(3)	-0.00015	-1.02686	7.13787	400.197
ASX (Australia)	(4)	-0.00039	-0.76163	4.12915	397.843
NYSE (America)	(5)	-0.00050	-0.69843	6.36311	416.711
IBOV (Brazil)	(6)	0.00190	-0.79828	5.27222	347.912
NIKKEI (Japan)	(7)	-0.00136	0.13966	2.91632	394.249
DAX (German)	(8)	-0.00105	0.21138	7.93913	367.343
KOSPI (South Korea)	(9)	-0.00103	-0.10501	3.37686	405.940
NSE (India)	(10)	-0.00071	-0.75882	5.45398	380.216

Table 4: GARCH Testing (after the G20 Presidency)

Stock Exchange		GARCH (1,1)			
		c	α	β	$\alpha+\beta$
JKSE (Indonesia)	(1)	0.000830	0.250643	0.650289	0.90093
SSE (China)	(2)	0.000518	0.664075	0.193143	0.85722
FTSE100 (England)	(3)	0.000751	0.371373	0.623198	0.99457
ASX (Australia)	(4)	-0.000403	0.165835	0.602067	0.76790
NYSE (America)	(5)	-0.000474	0.166381	0.804018	0.97040
IBOV (Brazil)	(6)	0.001950	0.087810	0.820771	0.90858
NIKKEI (Japan)	(7)	-0.001079	0.097732	0.893910	0.99164
DAX (German)	(8)	-0.000048	0.317696	0.672783	0.99048
KOSPI (South Korea)	(9)	0.000336	-0.059297	1.052791	0.99349
NSE (India)	(10)	-0.000457	0.074648	0.850747	0.92539

3.3 Capital Market Integration

This study found that during the COVID-19 pandemic and before the G20 presidency, the integration of capital market return between Indonesia (JKSE) and Australia (ASX) was significant and positive, with a

value of 0.542470. This result revealed that both countries had an autocorrelation of 0.563814. Higher integration or autocorrelation with both countries may likely result in a higher volatility effect on the stock market movement in both countries. Indonesia (JKSE) exhibited the strongest integration with (ASX), followed by South Korea with a value of 0.542470. The increase in return integration between Indonesia (JKSE) and South Korea (KOSPI) might be accounted for by the two countries' strong cooperation. A stronger capital market is related to the countries' fiscal condition, their geospatial proximity (Zhang et al., 2019), and economic cooperation (Hess, 2004). Strategic economic cooperation between Indonesia and South Korea to recover from the COVID-19 pandemic was done through Joint Committee Meeting on Economic Cooperation (JCEC).

After the G20 presidency, Indonesia (JKSE) exhibited the strongest capital market return integration with India (NSE), which was significant and positive with a value of 0.507229. The two countries' stronger integration was likely to be accounted for by the Indian Presidency in 2023, among other factors. The strategic cooperation between the two countries was strengthened, as both countries were committed to supporting a G20's common goal, namely post-COVID-19 pandemic recovery. In addition to India, the Indonesian stock market (JKSE) also exhibited co-movement with Australia. The cooperation constituted the follow-ups of cooperation with Indonesia, which was represented by the meeting between the Indonesian Ministry of Finance and the G20 Central Bank Governor. In the meeting, Indonesia was committed to contributing to the development of a green economy and post-pandemic recovery. In addition to India and Australia, a significant improvement was also noticed in the integration between Indonesia's JKSE and the USA's NYSE, increasing from 0.354906 (before the presidency) to 0.385410 (after the presidency). This improvement indicated a stronger collaboration and visits between the two countries.

Before the G20 Indonesia Presidency, the return integration of the Chinese stock market (SSE) was found to be significant and strong to South Korea (KOSPI) (i.e., 0.408792), followed by Australia (ASX) (i.e., 0.338025). The cooperation and geospatial proximity with South Korea may explain the integration. Zhang et al. (2019) assert that geospatial proximity may affect the stock market integration between the two countries. This study also found that England (FTSE100) had the strongest relationship with Germany (DAX) (0.857682), followed by the USA (NYSE) (0.663646) and Australia (ASX) (0.651556). Meanwhile, Australia (ASX) exhibited the strongest integration with England (FTSE100) with a value of 0.651556. This stronger integration appeared to be accounted for by the free trade agreement between the two countries. The USA (NYSE) exhibited the strongest return integration with England (FTSE100) (0.663646) and Germany (DAX) (0.641797). Brazil (IBOV) also showed the strongest return integration with the USA (NYSE) (0.510837), which may be accounted for by the geospatial proximity between the two countries. Japan (NIKKEI) was found to have the most significant integration with Australia (ASX) (0.578511), followed by South Korea (KOSPI) (0.578279). Germany (DAX) had the strongest return integration with England (FTSE100) (0.857682) and Australia (ASX) (0.595169). The integration between South Korea (KOSPI) and Australia (ASX) appeared to increase (0.609940), followed by integration with Japan (NIKKEI) (0.578279). Meanwhile, the integration between India (NSE) and England (FTSE100) also increased (0.50856), followed by the increase in integration with Indonesia (JKSE) (0.495020).

After the G20 Presidency of Indonesia, the Chinese stock market (SSE) exhibited the most significant and strongest integration with South Korea (KOSPI) (0.410766), followed by integration with Australia (ASX) (0.389756). This study also found that England (FTSE100) had the strongest relationship with Germany (DAX) (0.770253), followed by a relationship with the USA (NYSE) (0.638378). The Australian stock market (ASX) revealed the strongest integration with South Korea (KOSPI) (i.e., 0.58385) and India (NSE) (i.e., 0.560597). Meanwhile, the USA (NYSE) had the strongest integration with Germany (DAX) (0.547575) and Brazil (IBOV) (0.527560). Brazil (IBOV) also showed the strongest return integration with the USA (NYSE) (0.527560), which may be accounted for by the geospatial proximity between the two countries. Japan (NIKKEI) was found to have the most significant integration with Australia (ASX) (0.540878), followed by South Korea (KOSPI) (0.540292). Germany (DAX) exhibited the strongest return integration with England (FTSE100) (0.770253) and the USA (NYSE) (0.547575). The integration between South Korea (KOSPI) and Australia (ASX) seemed to increase (0.583851), followed by integration with Japan (NIKKEI) (0.540292). Meanwhile, India (NSE) exhibited the strongest integration with England (FTSE100) (0.638378).

Table 5. Capital Market Integration Testing before Indonesia's G20 Presidency with DCC-GARCH (1,1)

	JKSE	SSE	FTSE100	ASX	NYSE	IBOV	NIKKEI	DAX	KOSPI	NSE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
JKSE (Indonesia) (1)		0.37293***	0.44789***	0.56381***	0.35490***	0.35691***	0.42538***	0.37706***	0.54247***	0.49502***
SSE (China) (2)	0.37293***		0.31144***	0.33802***	0.22914***	0.17393***	0.29923***	0.29335***	0.40879***	0.33594***
FTSE100 (England) (3)	0.44789***	0.31144***		0.65155***	0.66364***	0.45896***	0.37961***	0.85768***	0.48985***	0.50856***
ASX (Australia) (4)	0.56381***	0.33802***	0.65155***		0.46419***	0.43301***	0.57851***	0.59516***	0.60994***	0.49619***
NYSE (America) (5)	0.35490***	0.22914***	0.66364***	0.46419***		0.51083***	0.24015***	0.64179***	0.33706***	0.35198***
IBOV (Brazil) (6)	0.35691***	0.17393***	0.45896***	0.43301***	0.51083***		0.25608***	0.45459***	0.40391***	0.33273***
NIKKEI (Japan) (7)	0.42538***	0.29923***	0.37961***	0.57851***	0.24015***	0.25608***		0.39880***	0.57827***	0.33425***
DAX (German) (8)	0.37706***	0.29335***	0.85768***	0.59516***	0.64179***	0.45459***	0.39880***		0.45461***	0.46904***
KOSPI (South Korea) (9)	0.54247***	0.40879***	0.48985***	0.60994***	0.33706***	0.40391***	0.57827***	0.45461***		0.45587***
NSE (India) (10)	0.49502***	0.33594***	0.50856***	0.49619***	0.35198***	0.33273***	0.33425***	0.46904***	0.45587***	

*significant at 10%, **significant at 5%, ***significant at 1%

Table 1.6. Capital Market Integration Testing after Indonesia's G20 Presidency with DCC-GARCH (1,1)

	JKSE	SSE	FTSE100	ASX	NYSE	IBOV	NIKKEI	DAX	KOSPI	NSE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
JKSE (Indonesia) (1)		0.23012***	0.34699***	0.40399***	0.38541***	0.31605***	0.22519***	0.39225***	0.38301***	0.50722***
SSE (China) (2)	0.23012***		0.29761***	0.38975***	0.16551***	0.22845***	0.36475***	0.23753***	0.41076***	0.28012***
FTSE100 (England) (3)	0.34699***	0.29761***		0.49959***	0.51709***	0.44423***	0.33579***	0.77025***	0.46925***	0.63837***
ASX (Australia) (4)	0.40399***	0.38975***	0.49959***		0.32202***	0.30731***	0.54087***	0.39950***	0.58385***	0.56059***
NYSE (America) (5)	0.38541***	0.16551***	0.51709***	0.32202***		0.52756***	0.27954***	0.54757***	0.36024***	0.46343***
IBOV (Brazil) (6)	0.31605***	0.22845***	0.44423***	0.30731***	0.52756***		0.16761***	0.40404***	0.30453***	0.37286***
NIKKEI (Japan) (7)	0.22519***	0.36475***	0.33579***	0.54087***	0.27954***	0.16761***		0.34302***	0.54029***	0.37862***
DAX (German) (8)	0.39225***	0.23753***	0.77025***	0.39950***	0.54757***	0.40404***	0.34302***		0.45823***	0.60267***
KOSPI (South Korea) (9)	0.38301***	0.41076***	0.46925***	0.58385***	0.36024***	0.30453***	0.54029***	0.45823***		0.48663***
NSE (India) (10)	0.50722***	0.28012***	0.63837***	0.56059***	0.46343***	0.37286***	0.37862***	0.60267***	0.48663***	

*significant at 10%, **significant at 5%, ***significant at 1%

Conclusions

This study examined the correlation between the Indonesian capital market and other G20 members (i.e., China, England, Australia, USA, Brazil, Japan, Germany, South Korea, and India). Collaboration among the G20 member countries was found to affect the economic sectors positively, particularly in supporting their efforts in post-COVID-19 pandemic recovery. The study was conducted before the Indonesian G20 Presidency (January 2020- 29 October 2021) and after the Indonesian presidency (30 October 2021 - 22 April 2022). Applying dynamic conditional correlation (DCCGARCH), the data in this study were daily-time series data. This study concluded that during the COVID-19 pandemic and before the G20 presidency, the integration of capital market return between Indonesia (JKSE) and Australia (ASX) was significant and positive with a value of 0.563814, followed by South Korea (KOSPI) with a value of 0.542470. Higher integration or autocorrelation with both countries may likely result in a higher volatility effect on the stock market movement in both countries. After the G20 presidency, Indonesia (JKSE) exhibited the strongest capital market return integration with India (NSE), which was significant and positive with a value of 0.507229. A significant improvement was also noticed in the integration between Indonesia (JKSE) and the USA (NYSE). This improvement suggested a stronger collaboration and visits between the two countries. Furthermore, it was also found that China (SSE) exhibited integration with South Korea (KOSPI), while Germany (DAX) exhibited integration with England (FTSE100). Australia (ASX) also had a strong integration with England (FTSE 100). Capital market integration may be affected by the geospatial relationship and economic cooperation.

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