Integration of Indonesian Capital Market and ASEAN Capital Market: A Study during the Covid-19 Pandemic

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Abstract

This research was conducted to examine the integration of the Indonesian capital market with the capital markets of other countries in ASEAN before and during the COVID-19 pandemic, so the results of this study are expected to provide an overview for investors in making investment decisions. Investment decision-making, especially in international diversification. The sample used in this study is the capital market index of Indonesia, Malaysia, Singapore, the Philippines, Thailand, and Vietnam. The analysis technique uses the Vector Error Correction Model (VECM). The analytical tool used is Eviews 11 software. The results show that there is proven integration between the Indonesian capital market and the capital markets of Malaysia, Singapore, the Philippines, Thailand, and Vietnam. In addition, this research also states that there is an increase in the integration of the Indonesian capital market with the capital markets that are members of the ASEAN Exchange, especially during the Covid-19 period.

1.   INTRODUCTION

Economic development that occurs in a country is an important thing that is often used as a guide to finding out the good and bad economic conditions of the country. The development itself can be caused by several sectors, such as consumption, industry, investment, distribution, export-import, and others. One of the financial industry sectors that has a big enough influence and a high sensitivity to global activities is the capital market (Kowanda, D., Pasaribu, R. B. F., and Shauti, A. F, 2017).

The capital market is a meeting between companies and other institutions that need funds from the public to develop a business, expand, make capital investments, and other things that are related to the desire of the public to invest their funds. They can invest their funds in the form of stocks, bonds, mutual funds, and others. The capital market has an

important influence on strengthening the economic conditions of a country, where it will also affect investors when investing in the capital market, especially stocks (Sari, 2019).

Before investors buy the shares, they must be able to find out the potential of the shares they buy. One of which is by looking at the volatility of stock statistics. Volatility can show the risks and uncertainties that will be faced by the investors, which means that the higher the risk which will be faced by investors, the higher the volatility of interest from investors to invest their funds (Robiyanto, R., Wahyudi, S., and Pangestuti, I. R. D, 2017). The investors, however, usually prefer stocks that have high volatility because there is also a great opportunity to get capital gains even though the consequences are large as well.

The volatility that occurs in stock prices can be seen through Jakarta Composite Index (JKSE). If the stock price increases, the economy is strengthening and vice versa. If the Composite Stock Price Index of a country has increased, it means there's an increase in the country's economic performance. The economic activities of a country have attachments and dependencies between one country and another.

The world economy, due to capital liberalization, has emerged as the background for the transmission of financial market volatility, including the stock market. Volatility transmission looks at how volatility and the stock market affect the volatility of other stock markets (Amizuar, S., Ratnawati, A., and Andati, T, 2017). The Jakarta Composite Index (JKSE) activity is influenced by the price index movements that occur in other countries, especially in countries that have relatively close geographic locations, such as countries located in Southeast Asia (ASEAN). This is because ASEAN, which is a regional community, is now growing with increased economic cooperation among ASEAN member countries. As a regional community, ASEAN often faces various conflicts along with the increasing demand for economic growth in the region. In ASEAN itself, there is the ASEAN stock exchange or more commonly referred to as the ASEAN Exchange, which consists of the Indonesia Stock Exchange, Malaysia Stock Exchange, Straits Time Index, Stock Exchange of Thailand, Philippine Stock Exchange, and Ho Chi Minh Stock Exchange.

ASEAN Exchange was formed to provide benefits to the countries involved in it. This is supported by the research by Puspitasari, Siregar, and Andati (2015), which states that the integration of the stock exchange will have a positive impact - since it can provide opportunities for companies that want to get capital as well as for investors who will invest their funds.

One of the phenomena in the financial sector that had a considerable impact was the subprime mortgage crisis that occurred in the United States back in 2007. This crisis caused a disaster in the stock market. So many studies have been conducted focusing on the stock market which has developed, such as the United States, Japan, and western Europe. Not a few results from the existing research show that after the subprime crisis, the co-movement between stocks is getting stronger (Robiyanto, 2018).

From the research that was conducted by Muharam, et al. (2020), the Indonesian, Philippine, and Malaysian capital markets are not segmented but integrated with capital markets in Asia. Other research, however, states that the capital markets of ASEAN countries are integrated (Robiyanto et al., 2021). From some existing research, it can be concluded that not all countries correlate with other countries that will have an impact on the economy of a country. Global market integration will have a positive impact on the domestic economy, namely, accelerating the development of the domestic capital market,

increasing capital market efficiency, and opening greater access to sources of financing from abroad. On the other hand, the integration of the global market can cause the domestic market to be susceptible to external shocks (Pasifik, 2012).

The problem in this study is to see the level of integration of the Indonesian capital market with the ASEAN capital market in the 2018-2021 period. If in previous research, the international capital market was affected by the subprime mortgage crisis due to the dynamic nature of the capital market, the current research problem is Covid-19 which has caused the financial sector to weaken too. International financial shocks will cause stock price instability in the affected countries (Lee, 2012). Therefore, it is necessary to pay close attention to the integration of the capital market during the period before and during the Covid-19 pandemic, to know whether there are differences in the relationship between the capital market in calm and crisis times. To avoid a discussion that is too broad, this research is limited to a few things, namely the Indonesian Composite Stock Price Index. While for foreign stock exchanges, this study uses stock prices from *The Bursa Malaysia Index*, The Philippine Stock Exchange, The Stock Exchange of Thailand, the Straits Time Index, and the Ho Chi Minh Stock Exchange.

This is based on the geographical condition of the selected country close to Indonesia, which is still located in one region. In addition to that, the economic conditions between countries tend to be the same when viewed from the economic growth. This research is divided into two periods, namely the period before Covid-19 (January 2018-June 2019) and the period during Covid-19 (January 2020-June 2021), to be able to see whether there are differences in integration between countries before the Covid-19 pandemic and during the time of Covid-19 pandemic.

The research can be used as a guide for investors and financial analysis so they can consider when making decisions by looking at the results of this study.

2.   LITERATURE STUDY AND HYPOTHESES DEVELOPMENT

Contagion Effect

The World Bank says that the economic condition of a country can not only be determined by the country itself - but there is also influence from other countries. This relationship is called the Contagion Effect. It is not able to occur in economic conditions that are in crisis but can occur in normal economic conditions. In a broad sense, the contagion Effect is the transmission of shock between countries. When a country experiences a shock caused by a phenomenon, the surrounding countries will also feel the shock (Robiyanto and Fajar Hartanto, 2018).

The rapid development that occurs in the capital market, especially in developing countries, has an important role, namely the acquisition of capital, which can be called capital inflow. It is a short-term investment that is used as a target for capital acquisition by domestic and foreign investors, therefore it will cause a domino effect. If a country has a geopolitical problem or other problems, investors will think that there are indications that cause the decline in performance that occurs in the index and end up buying other securities to avoid large losses and will also get large returns in other countries.

The Contagion Effect can be seen in the phenomenon that occurred during the financial crisis in the United States, which was caused by a subprime mortgage default in 2007. This crisis triggered a significant drop in international stock markets, which can be seen in the falling of the index of stocks of developing and developed countries. It caused

damage to the banking system, weakening currency values of developing countries, falling commodity prices, and falling debt securities markets.

It can be concluded that the Contagion Effect will occur in countries that are integrated in various ways, one of which is the existence of interdependent relationships.

Capital Market Integration
The capital market is said to be integrated when it has assets with correlated returns but has the same price, even though they are traded in different locations (Widagdo, S. B., Chabachib, M., and Mahfud, M. K., 2013). Capital market cointegration occurs when countries owning capital markets have liberalized their capital markets. In a liberalized capital market, investors can take the opportunity to diversify their portfolios more broadly. If cointegration occurs, however, investors will not be able to diversify their portfolios because every capital market among countries will move with the same information. The prices of traded assets will not be underpriced or overpriced. This causes investors to be unable to make long-term profits (Widagdo, S. B., Chabachib, M., and Mahfud, M. K., 2013).

Composite Stock Price Index
The Composite Stock Price Index is a valuable indicator that reflects the performance of stocks listed on the stock exchange. According to Hartono (2014:125), the Composite Stock Price Index listed on the Indonesian stock exchange includes movements of common stock and preferred stock. Not only that, but the Jakarta Composite Index (JKSE) is also considered the basis of analysis that is often used by analysts to see the condition of shares in the Indonesian capital market. This is because the Composite Stock Index always pays close attention to the movement of shares in the capital market (Fahmi, 2014:311).

Hadi (2013:185) states that the Composite Stock Index has a function as an indicator of market trends, profit level indicators, benchmarks for the performance of a portfolio, sources of facilities for the development of derivative products, guidelines for the qualifications and performance of issuers, indicators of trust for domestic and foreign investors. Also, an overview of the direction of capital flows in a country and sources of funding with a cost of capital.

Two factors influence fluctuations in the capital market in various countries, namely microeconomic and macroeconomic factors. As for macroeconomic factors, they adjust more quickly to stock prices and cannot be avoided because they are not only about one or two companies listed on the Stock Exchange. All companies listed on the Stock Exchange, however, may be affected. Therefore, the movement of the Jakarta Composite Index (JKSE) on the IDX is strongly influenced by several macro factors, such as Gross Domestic Product (GDP), inflation, interest rates, rising prices of goods, and the rupiah exchange rate (Shiyammurti et al., 2020).

Hypothesis development
The developing stock market can be integrated with the global stock market due to liberalization. A liberal stock market is a stock market that allows foreign investors to buy and sell securities freely. The stock market will be considered integrated if the investors face general and country-specific risks but set prices by considering the general risks for countries that have been properly diversified (Robiyanto, 2018). This means that similar asset prices can be applied to an integrated stock market, while global factors occur for the expected results.

The liberalization process can have a positive impact that it can support major changes in the stock markets in Asia, which include Indonesia, Malaysia, the Philippines, Taiwan, Thailand, and South Korea. The integration of stock markets in the Asian region has increased since the liberalization took place (Bilson, C., Hooper, V., and Jaugietis, M, 2001). Countries in Southeast Asia, including Indonesia, have stock exchanges that are integrated into one of the foreign exchanges called the ASEAN Exchange. Stocks have an index that can represent and describe the condition of the capital market of their respective countries. The main stock indexes of the ASEAN Exchange used in this study are Bursa Malaysia (KLSE), The Philippine Stock Exchange (FTSE), The Stock Exchange of Thailand (SET), Straits Time Index (STI), and Ho Chi Minh Stock Exchange (VN).

The Contagion Effect can be integrated into countries that are in the same area because they have the same movement equation, and the transmission effect is quite high. This is supported by Aditya, Sinaga, B. M., and Maulana, A. (2018), who states that in the event of the monetary crisis that occurred in 1997, which was triggered by the issue of the Thai exchange rate in July 1997, quickly spread and resulted in the collapse of the stock market in Indonesia. Several neighboring countries, such as Indonesia (-71%), Malaysia (-57%), Philippines (-58%), Singapore (-24%), and South Korea (-72%). Therefore, the equation of movement and transmission is quite high so that countries that are in the same regional area as countries that are members of the ASEAN Exchange can be felt in the short term to the long term. The capital market will also show a stable and long-term joint movement if it experiences integrity.

Research proves that there is integration between the Asean stock price index and the Jakarta Composite Index (JKSE), among others. Aditya's research (2012) states that the stock markets of countries that are in the same region and have geographical areas adjacent to Indonesia, such as Malaysia, Singapore, the Philippines, Japan, Hong Kong, and Australia, have Granger causality with the Indonesian stock market. This is due to the relationship between the Indonesian stock market and foreign stock markets, which can be in the form of economic relations, such as export-import. This is also supported by research from Widagdo (2013), which states that there was capital market integration between Indonesia and Asean-5 countries from 2001 to 2009. It has increased integration after the ratification of the Kyoto Protocol by Indonesia.

The two studies above, however, are different from the research that was conducted by Pamungkas and Darmawan (2018). It states that the variables of the Kuala Lumpur Composite Index (KLSE), Philippine Stock Exchange Index (PSEi), The Stock Exchange of Thailand (SET), and Ho Chi Minh Stock Exchange (VN) have a positive or unidirectional effect on the Jakarta Composite Index (JKSE). Meanwhile, the Straits Time Index (STI) variable has a negative effect.

Global market conditions, especially capital markets that are members of the ASEAN Exchange which have been liberalized due to their close geographical location, and the results of several studies, state that liberalized countries will be more susceptible to external shocks if a phenomenon occurs that affects a country's economy. Therefore, the Covid-19 pandemic phenomenon that has hit almost all countries has caused a shock to the country's economy, especially in countries that are located close together.

Based on this background, the following hypothesis can be formulated:

H1a: KLSE is integrated with the JKSE in Indonesia.
H1b: PSEi is integrated with the JKSE in Indonesia.

H1c: SET is integrated with the JKSE in Indonesia.
H1d: STI is integrated with the JKSE in Indonesia.
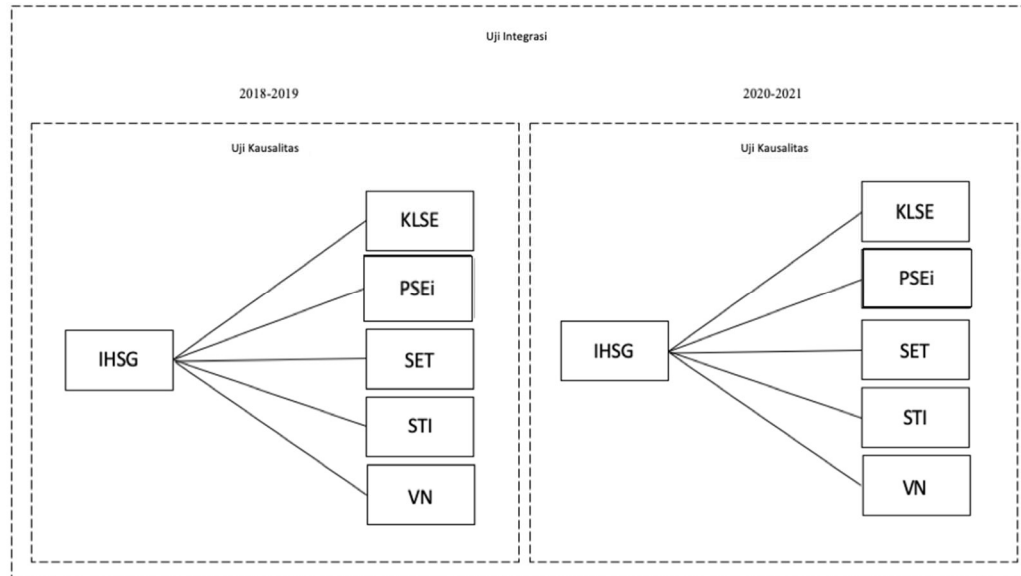H1e: VN is integrated with the JKSE in Indonesia.

Figure 1. Research Model

3. METHOD, DATA, AND ANALYSIS

Population and Sample

The population of this study is the ASEAN stock index. The sampling technique used in this research is using probability sampling method with a cluster sampling technique. Probability sampling is a sampling technique that provides equal opportunities to be selected as sample members, and cluster sampling is data collection from regional groups originating from population distribution. The purpose of sampling is to determine which area will be used to represent the population in this study. The study itself will take a sample of 6 Asean Exchange Index (Asean Exchange), which are divided into two-period groups, namely the period before Covid-19 (January 2018-June 28th, 2019) and the period during Covid-19 (January 2020-June 30th, 2021).

Table 2. ASEAN Stock List

NO	Index Code	Exchange Name
1	IDX	Bursa Efek Indonesia
2	KLSE	Bursa Malaysia
3	STI	Straits Time Index
4	SETi	The Stock Exchange of Thailand
5	PSEi	The Philippine Stock Exchange
6	VNI	Ho Chi Minh Stock Exchange

Source: https://www.aseanexchanges.org

Due to the relatively close location of the countries, there is an opportunity for stock indexes on the ASEAN stock exchange to have a relationship with the JKSE, especially

during the Covid-19 pandemic, which since the end of 2019 has shaken almost all countries the world, including the countries in Asia.

Types of Data, Data Sources, and Data Collection Techniques

The type of data in this study is secondary data. The data consists of daily sample data with a timeframe that is divided into two periods, namely the period before Covid-19 (January 2, 2018-June 28, 2019) and the period during Covid-19 (January 2, 2020-June 30, 2021). The period was chosen to see the contagion effect, which has occurred in countries located in Southeast Asia, especially those that are integrated into the ASEAN Exchange or Asean Exchange on the Indonesian economy since the spread of the Covid-19 pandemic in the Southeast Asia region.

The data collection technique used in this research is a documentation study. The data used is daily data on the index of the Indonesian stock exchange and the ASEAN stock exchange, which have been selected as samples. The data is sourced from the websites *www.finance.yahoo.com* and *www.idx.co.id*.

Operational Definition

Table 1. Operational Definition

Variable	Definition
IDX	The stock index of the Indonesia Stock Exchange covers as many as 777 components of companies listed on the Indonesia Stock Exchange
KLSE	The stock index of Bursa Malaysia covers as many as 967 components of companies listed on the Bursa Malaysia
STI	The stock index of Straits Time Index covers as many as 30 companies listed on the Singapore Exchange
SETi	The stock index of the Thailand Stock Exchange includes 850 companies listed on the Thailand Stock Exchange
PSEi	The stock index of The Philippine Stock Exchange which includes 283 companies listed on PSE Edge
VNI	The stock index of the Ho Chi Minh Stock Exchange covers as many as 303 companies listed on the Vietnam Stock Exchange

Source: *www.finance.yahoo.com* and *www.investing.com*

Data Analysis Technique

The method used is quantitative analysis. Data will be processed using the technical analysis of Vector Auto Regression (VAR) if the data used is stationary data at the level stage. But if the data is not stationary at the level stage, the researcher will adjust it using the Vector Error Correction Model (VECM). The analysis tool uses Eviews 11 software.

The standard form of the VAR equation is:

$$X_t = \beta_0 + \beta_n X_{t-n} + e_T$$

Information:

X_t : Vector element of variable
β_0 : Vector constant n x 1
β_n : Coefficient of X_t
n   : Lag length
e_T : Vector of a shock to each variable

Meanwhile, the general form of the VECM model is:

$$\Delta Y_t = \alpha e_{t-1} + \beta_1 \Delta Y_{t-1} + \beta_2 \Delta Y_{t-2} + \cdots + \beta_p \Delta Y_{t-p+1} + \varepsilon_t$$

Where the $e_{t-1} = Y_{t-1} - (\varphi + \omega X_{t-1})$

Information:

ΔY_t : The first derivative vector of the dependent variable

Y_{t-1} : Variable first derivative vector with 1st lag

e_{t-1} : The error obtained from the regression equation between Y and X in the 1st lag is also called ECT (Error Correction Term)

ε_t : Residual vector

α: Cointegration coefficient matrix

The first step that will be carried out by the researcher is to conduct a pre-estimated test consisting of a stationary data test (unit root test) and a VAR (the root of the characteristic polynomial) stability test. If the results from the stationary data test consist of a root, then it will estimate a model by using data because the trend of data will tend to fluctuate so that it's not around the average value.

After conducting the pre-estimation test, it will be continued with the Engle-Granger cointegration test to know whether there are groups of variables that are not stationary. Variables that are not stationary will be tested further to determine whether these variables are integrated or not. If it turns out that these variables are integrated, it can be ascertained that there is a long-term relationship between the variables. Furthermore, to determine the ability of a variable to influence other endogenous variables, an IRF (Impulse Response Function) analysis will be carried out. Meanwhile, to find out the short-term relationship, a Granger Causality analysis can be done.

4. RESULTS

Descriptive statistics

Table 3. Descriptive Statistics of Price Index Before Covid-19

Index	Min	Max	Mean	Std. Dev
IDX	5,634	6,681	6,164	274
KLSE	1,598	1,895	1,742	82
STI	2,966	3,615	3,287	163
PSEi	6,844	9,059	7,771	480
SETi	1,548	1,837	1,694	73
VNI	878	1,198	992	75

Source: secondary data processed, 2020

Descriptive statistics explain the variation of research data. The minimum value is the drawdown of the lowest index price, while the maximum value is the all-time high of the index price. The standard deviation value shows the risk of an investment portfolio. The risk in question includes market risk as well as risk originating from the portfolio itself. The greater the standard deviation, the greater the risk of the stock (Giharta and Sedana, 2017).

Based on Table 3 shows that IDX's all-time high before the Covid-19 period was at the level of 6,61, and the lowest point was at the level of 5,634. At the same time, the average value is at the level of 6,164, with a standard deviation of 274. The standard deviation value is much smaller than the average value, indicating that IDX volatility is not too high.

KLSE's all-time high is at the level of 1,895, and the lowest price is at the level of 1,598. The average KLSE price for the pre-covid period showed at the level of 1,742 with a standard deviation value of 82. Statistically, it can be said that the market risk on the KLSE index is relatively small or has low volatility.

STI experienced an all-time high at the level of 3,615 and a drawdown for the period before Covid-19 at the level of 2,966. While the average price of the STI index for the period before Covid-19 was at the level of 3,287. The STI standard deviation value of 163 is much smaller than the average value of the STI index price for the period before Covid-19. This shows that the risk or volatility of STI is quite small.

The PSEi index experienced an all-time high at the level of 9,059 and a drawdown for the period before Covid-19 at the level of 6,844. While the average price of the PSEi index for the period before Covid-19 was at the level of 7,771. The standard deviation value of PSEi is at the level of 480. This value is much smaller than the average value of the PSEi index price but is the largest deviation value compared to the other five indices. This means PSEi is riskier or has fairly high volatility compared to the five indices.

SETi's all-time high is at the level of 1,837, and the lowest price or drawdown is at the level of 1,548. The average SETi price for the period before Covid-19 was at the level of 1,694 with a standard deviation value of 73. Statistically, it can be said that the market risk on the SETi index is relatively small or has low volatility because the standard deviation value of 73 is much smaller than the average of 1,694.

The all-time high VNI is at the level of 1,198, and the lowest price for the period before Covid-19 is at the level of 878. Meanwhile, the average price of the VNI index for the period before Covid-19 is at the level of 992. The standard deviation value of the VNI is at the level of 75, statistically, it can be seen that the market risk on the VNI index is relatively small or has low volatility.

Table 4. Descriptive Statistics of Index Prices during Covid-19

Indeks	Min	Max	Mean	Std.Dev
IDX	3,938	6,476	5,532	630
KLSE	1,220	1,674	1,539	85
STI	2,164	3,281	2,831	283
PSEi	4,623	7,841	6,486	653
SETi	1,024	1,637	1,412	145
VNI	659	1,410	1,000	183

Source: secondary data processed, 2020

Based on Table 4 shows that the all-time high IDX during the Covid-19 period was at the level of 6,476, while the lowest point was at the level of 3,938. The average value is at the level of 5,532, with a standard deviation value of 630. The standard deviation value is still smaller than the average value. This indicates that IDX volatility is not too high.

The KLSE all-time high is at the level of 1,674, and the lowest price is at the level of 1,220. The average KLSE price for the period during Covid-19 was at the level of 1,539 with a standard deviation of 85. Statistically, it can be said that the market risk on the KLSE index is relatively small or has low volatility.

STI experienced an all-time high at the level of 3,281 and a drawdown for the period before Covid-19 at the level of 2,164, while the average price of the STI index for the period before Covid-19 was at the level of 2,831. The standard deviation value of STI is 283. This value is much smaller than the average value of the STI index price for the period before Covid-19, showing that the risk or volatility of STI is quite small.

The PSEi index experienced an all-time high at the level of 7,841 and a drawdown for the period during the Covid period at the level of 4,623. While the average price of the PSEi index for the period before Covid was at the level of 6,486. The standard deviation value of PSEi is at the level of 653. This value is much smaller than the average value of the PSEi index price but is the largest deviation value compared to the other five indices. This means that PSEi is riskier or has high volatility when compared to the five indices.

The all-time high of SETi is at the level of 1,637, and the lowest price or drawdown is at the level of 1,024. The average price of STEi during the Covid-19 period was at the level of 1,412, with a standard deviation value of 145. Statistically, it can be said that the market risk on the STEi index is relatively small or has low volatility because the standard deviation value of 145 is much smaller than the average of 1,412.

The VNI index experienced an all-time high at the level of 1,410 and the lowest price for the period during Covid-19 at the level of 659. The average price of VNI for the period during Covid-19 was at the level of 1,000 with a standard deviation of 183. This value is much smaller than the average value of the VNI index. It means that VNI has a relatively small risk or low volatility.

Stationarity Test

The time-series data used in this study is required in the form of stationary data - because non-stationary data can cause the test results to be spurious and give ambiguous results. The results of the stationarity test show the variables in a study in table 3. From the results of the stationarity test, the intercept level data resulted in the absolute augmented statistic dickey-fuller test (ADF) less than the Mackinnon threshold (1%, 5%, and 10% respectively).

Table 5. Stationarity Test

Index	Augmented Dickey-Fuller Test	
	Pre-Covid	**During Covid**
IDX	0.000	0.000
KLSE	0.000	0.000
STI	0.000	0.000
PSEi	0.000	0.000
SETi	0.000	0.000
VNI	0.000	0.000

Source: secondary data processed, 2020

The results of the data stationarity test can be seen in Table 5. The stationarity test was calculated using the Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1981). Based on Table 5, the data used in this study has a p-value that is significantly smaller at the 0.05 level, meaning that all data in this study are stationary and are indicated to have no unit

root. This means that there is a possibility of integrated capital markets in the five countries (there is a long-term relationship).

Optimum Lag Setting

Determination of the optimum lag is carried out to determine the magnitude of the lag (past time/period) on the behavior of the current data. From the results of the analysis using the Sequential modified LR test, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan Quinn Information Criterion (HQ). The results of the data analysis show the lag time for 0 periods which is considered the most optimal.

Table 6. Optimum Lag before Covid-19

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-8037.895	NA	4.12e+16*	55.28450*	55.36024*	55.31484*
1	-8017.202	40.39001	4.58e+16	55.38971	55.91988	55.60210
2	-7995.735	41.01683	5.06e+16	55.48959	56.47419	55.88402
3	-7973.797	41.01051	5.58e+16	55.58624	57.02527	56.16272
4	-7952.968	38.07905	6.20e+16	55.69050	57.58397	56.44903
5	-7921.400	56.41164*	6.41e+16	55.72096	58.06886	56.66154
6	-7893.012	49.55547	6.77e+16	55.77328	58.57561	56.89591
7	-7875.189	30.37873	7.71e+16	55.89821	59.15497	57.20288
8	-7850.410	41.21366	8.38e+16	55.97533	59.68652	57.46205

Table 7. Optimum Lag during Covid-19

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-7995.735	NA	4.06e+16*	55.48959*	56.47419*	55.88402*
1	-7875.189	30.37873	7.71e+16	55.89821	59.15497	57.20288
2	-7995.735	43.01683	5.06e+16	55.48959	56.47419	55.88402
3	-7973.797	41.01051	5.58e+16	55.58624	57.02527	56.16272
4	-7952.968	38.07905	6.20e+16	55.69050	57.58397	56.44903
5	-7973.797	41.01051	5.58e+16	55.58624	57.02527	56.16272
6	-7893.012	49.55547	6.77e+16	55.77328	58.57561	56.89591
7	-7875.189	30.37873	7.71e+16	55.89821	59.15497	57.20288
8	-7850.410	40.21366	8.38e+16	55.97533	59.68652	57.46205

Source: secondary data processed, 2020

Cointegration Test

To determine the presence or absence of cointegration, the Johansen test was carried out. If the Trace statistic is greater than the critical value or the prob value, less than 0.005, then it can be concluded that there is a cointegration equation relationship formed. The test results can be shown in Tables 8 and 9.

Table 8. Cointegration Test with Johansen Test before the Covid-19 pandemic

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.573293	1285.312	83.93712	0.0000
At most 1 *	0.563095	1031.517	60.06141	0.0000
At most 2 *	0.540635	784.7614	40.17493	0.0000
At most 3 *	0.490514	552.9444	24.27596	0.0000
At most 4 *	0.466738	351.9874	12.32090	0.0000
At most 5 *	0.424446	164.6220	4.129906	0.0000

Source: secondary data processed, 2020

Table 9. Cointegration Test with Johansen Test during the Covid-19 pandemic

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.473223	1125.322	97.26772	0.0000
At most 1 *	0.593035	1031.201	77.02241	0.0000
At most 2 *	0.440635	894.7012	48.10423	0.0000
At most 3 *	0.490534	232.0221	44.28536	0.0000
At most 4 *	0.566738	451.9771	10.92990	0.0000
At most 5 *	0.424346	234.3420	6.309406	0.0000

Source: secondary data processed, 2020

Based on the test results shown in the table, there is an integration relationship between the capital markets of the 6 countries that were sampled before the Covid-19 pandemic and during the Covid-19 pandemic. This integration relationship can be seen with the Trace statistic value greater than the critical value and the probability of the unit root of the residual equation is zero, so the residual data is stationary and there is an integration relationship.

Causality Test

To find the effect of shock on one variable on another, a causality test is necessary. The causality test used in this study is the Granger Causality Test. This causality test is divided into 2 groups. The division of the two-period groups is the same as the period group division at the time of estimation, namely the period before Covid-19 (January 2018-June 28th, 2019) and the period during Covid-19 (January 2020-June 30th, 2021). This division into 2 periods aims to determine whether there is a causal difference between endogenous variables before and after ratification. The difference in the number of causal relationships between the period before and after ratification will indicate an increase or decrease in the degree of integration between capital markets.

Table 10. Capital Market Causality Test Results for the period before Covid-19

Null Hypothesis:	Obs	F-Statistic	Prob.
IDX does not Granger Cause KLSE	295	0.23017	0.9492
KLSE does not Granger Cause IDX		2.73500	0.0197
PSEI does not Granger Cause IDX	295	0.39112	0.8548
IDX does not Granger Cause PSEI		1.68407	0.1384
SET does not Granger Cause IDX	295	1.17638	0.3208
IDX does not Granger Cause SET		1.03231	0.3988
STI does not Granger Cause IDX	295	0.98156	0.4293
IDX does not Granger Cause STI		0.93205	0.4605
VN does not Granger Cause IDX	295	1.03814	0.3954
IDX does not Granger Cause VN		1.66382	0.1434

Table 11. Results of the Capital Market Causality Test for the period during Covid-19

Null Hypothesis:	Obs	F-Statistic	Prob.
IDX does not Granger Cause KLSE	300	0.23017	0.9492
KLSE does not Granger Cause IDX		2.73500	0.0297
PSEI does not Granger Cause IDX	300	0.39112	0.0268
IDX does not Granger Cause PSEI		1.68407	0.0484
SET does not Granger Cause IDX	300	1.17638	0.3208
IDX does not Granger Cause SET		1.03231	0.3988
STI does not Granger Cause IDX	300	0.98156	0.4293
IDX does not Granger Cause STI		0.93205	0.4605
VN does not Granger Cause IDX	300	1.03814	0.3954
IDX does not Granger Cause VN		1.66382	0.1434

Source: secondary data processed, 2020

5. DISCUSSION

Based on the test results, it can be concluded that there is an integrated relationship between the Indonesian capital market and the capital market of Asean stock exchange member countries during the Covid-19 pandemic, meaning that the assets owned have the same price even though they are traded in different locations. This study is supported by

the basis of Johansen's test results. This test shows that the statistical Trace value of the Indonesian capital market and the Malaysian capital market is 1031,201, which is greater than the critical value and probability value - so that the data is stable and there is a long-term integration relationship.

The same test is carried out again to determine whether the Indonesian capital market has a long-term integration relationship with the capital markets of the Philippines, Thailand, Singapore, and Vietnam. The results of the four tests were 894,7012 in the Indonesian capital market and the Philippines capital market, 232,0221 in the Indonesian capital market and Thai capital market, 451,9771 in the Indonesian capital market and Singapore capital market, and 234,3420 in the Indonesian capital market and Vietnam capital market. These three values can indicate that the Indonesian capital market has a long-term integration relationship with the capital markets of the Philippines, Thailand, Singapore, and Vietnam. From the results of this test, it can be concluded that all hypotheses regarding the existence of an integrated relationship between the Indonesian capital market and the capital markets of Malaysia, Philippines, Thailand, Singapore, and Vietnam are accepted.

In addition, based on the results of the tests that have been carried out, it can also be concluded that there is a one-way causality relationship between the Malaysian capital market and the Indonesian capital market, and there is also a two-way causality relationship between the Indonesian capital market and the Philippine capital market. This is because the statement is evidenced by data from the Granger causality test which states that in the period before Covid-19 (January 2018-June 28th, 2019), there is only one causality relationship, namely a one-way causality relationship between the Malaysian capital market and the Indonesian capital market.

This one-way causality relationship is seen at the probability level of 1.97%. Meanwhile, during the Covid-19 period (January 2020-June 30th, 2019), apart from a one-way causality relationship between the Malaysian capital market and the Indonesian capital market with a probability level of 2.9%, a two-way causality relationship was also found between the Indonesian capital market and the Philippine capital market. This two-way causality relationship is shown by the probability of 2.6% and 4.8%. By comparing the two results of this causality test, it can be concluded that there is an increase in integration between the Indonesian capital market and other ASEAN capital markets.

This is supported by data on the trade balance between Indonesia and Malaysia, which can be seen from economic relations such as exports and imports between the two countries. The high demand for goods by Malaysia for Indonesia's mainstay commodities, such as coal, CPO, copper, iron and steel, and some chemical products, has made the trade balance between Indonesia and Malaysia. It's always a surplus for Indonesia since 2003. In 2018, the trade balance showed a surplus for Indonesia, and the deficit for Malaysia amounted to US$668.6 million. In 2019, the trade balance also showed a surplus for Indonesia and a deficit for Malaysia of US$1,026.5 million. In 2020, the trade balance also showed a surplus for Indonesia and a deficit against Malaysia of US$1,165.8 million.

It is undeniable that geographical and socio-cultural proximity can be a driving force for increased trade and investment between Indonesia and the Philippines. After the economies of both countries slumped due to the Covid-19 pandemic, both countries are optimistic about restoring their economies. In August 2020, the Indonesian Investment Commission Board (BKPM) together with the Philippines, signed a memorandum of

understanding (MoU). This MoU aims to promote and facilitate foreign investment from the Philippines to Indonesia and vice versa - and to increase the existing cooperation between the two countries, so there will be an increase in exports and imports of both countries.

6.   CONCLUSION, LIMITATIONS, AND SUGGESTIONS

Conclusion

This study aims to determine whether there is integration between the Indonesian capital market and the capital markets that are members of the ASEAN Exchange, which the capital markets of Malaysia, Singapore, Philippines, Thailand, and Vietnam during the Covid-19 pandemic. To see the pattern of integration, this research period is divided into 2 periods, the period before the Covid-19 period (January 2018-June 28th, 2019) and the period during the Covid-19 period (January 2020-June 30th, 2021). It can be concluded from this study that there is integration between the Indonesian capital market and the capital markets of Malaysia, Singapore, Philippines, Thailand, and Vietnam. In addition, this research also states there is an increase in the integration of the Indonesian capital market with the capital markets that are members of the ASEAN Exchange, especially during the Covid-19 period.

Limitation and suggestions

This study was conducted to analyze the impact of the Covid-19 pandemic on the integration of the Indonesian capital market with the ASEAN capital market. The study aims to analyze the impact of the Covid-19 pandemic on the integration of the Indonesian capital market and the ASEAN capital market. During the research, there was only the use of daily stock price data from six capital markets.

For further research, other macroeconomic indicators, such as exchange rates, inflation, and gross domestic product (GDP), are recommended to clarify whether the integration is due to the impact of the Covid-19 pandemic. This is because macroeconomic conditions can directly affect stock performance, meaning that when macroeconomic conditions in a country experience positive or negative change, investors will accumulate their impact on company performance in the future. Researchers can also expand the scope of capital markets, such as the Southeast Asian capital market, or to capital markets in other developed countries, such as the United States, United Kingdom, Germany, and so on, for further research. Researchers can also extend the period to be able to compare it with the post-Covid-19 pandemic situation.

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