Wacana– Vol. 26, No. 1 (2023)

ISSN : 1411-0199
E-ISSN : 2338-1884

Integration of Capital Market Indices in Asian Countries with Potential Contagion Effects

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Abstract

This study aims to (1) determine the relationship between the Nikkei 225 index, SSEC, STI, KLSE and JCI and (2) determine which capital market index movement has the dominant influence. This study uses the Nikkei 225 index, SSEC, STI, KLSE, and IHSG which are taken at the end of each month from January 2019 to February 2023. This study uses the VECM, IRF, and VD analysis methods. The research results obtained are (1) All short-term Asian stock indexes do not have the potential to infect the Japanese Index. In the long term, SSEC, STI, and JCI can infect the Nikkei 225, while KLSE does not have the potential to infect the NIKKEI 225. (2) All Asian stock indices in the short term have no potential to infect SSEC except NIKKEI 225. Only JCI can potentially infect SSEC in the long term, while STI and KLS have no contagion effect (3) There is no potential for short-term transmission to STI. For the long term, only NIKKEI 225, SSEC, and JCI can potentially to infect STI. (4) All Asian stock indices in the short term have no potential to be transmitted to KLSE. But in the long run, all of these Asian stock indices have the potential to spread to KLSE. (5) There is no potential for transmission in the short term to JCI. But in terms of transmission from NIKKEI 225 and SSEC. KLSE does not have a transmission effect on the JCI. (6) The dominant Asian stock index is the Nikkei 225, SSEC because this index is included in the index list with the largest market capitalization value in the Asian region.

Keywords: globalization, asian capital markets, economic openness, contagion effect, shock

INTRODUCTION

In the current era of society 5.0 where the development of technology made by humans can have many impacts on a country's economy, especially in the country's economic sector, these impacts can have positive or negative impacts. Because the openness of the economy in a country causes a relationship between one country and another or is integrated with each other. Because this relationship can lead to closer relations between one country and another and can also eliminate obstacles that exist when a country will cooperate in the trade sector with other countries so that the flow of trade between countries is smoother. In addition to the positive impacts, there are also negative impacts, namely that a country can be affected by the crisis experienced by other countries because in the era of globalization, the economies between countries have become more open, which has caused linkages and mutual influence between countries. Usually countries with a stronger level of economy or developed countries can have an effect on countries with economies that are at a level below or lower, the impact of one example can have an impact on capital market fluctuations in the affected country. There are several theories that explain how capital markets in developed countries can affect developing countries. One of the relevant theories is the theory of "Transfer of Capital" developed by the United States economist, Albert O. Hirschman. According to Hirschman's theory, developed country capital markets are able to influence developing countries through the mechanism of capital transfer. Capital transfer occurs when investors from developed countries shift their investment from their own countries to developing countries. This can happen because investors are looking for more profitable investment opportunities or because they are looking to diversify risk by placing their capital in countries that have higher economic growth.

At the end of 2019 the Covid-19 pandemic occurred which started in China and then spread throughout the world including countries in the Asian region such as Japan, Singapore, Malaysia, Indonesia, and also China. The impact of the Covid-19 pandemic felt by the State of Japan began to be felt at the end of March 2020 where the stock price index fell to 18% compared to the period at the end of January 2020. In addition, the activity of selling shares carried out by

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foreign investors in March was fairly higher than the activity of buying shares with a difference of up to 3.8 million. This difference is much larger than the buying and selling activities that occurred in 2019. The country of Indonesia was also affected by the pandemic, to be precise on March 31 2020, the index experienced a correction of 24% when compared to the closing index value in the period ending January 2020, in March was also recorded when the volume of selling shares by investors was more than the number of buying shares. Furthermore, Singapore, which was affected by the pandemic, has decreased by 22.03% since the beginning of 2020, the same has been experienced by Malaysia, which has decreased by 3.86% since early 2020. And finally, China itself, whose stock price index has fallen by more than of this 10% decline occurred because investors investing in China were worried that the Covid-19 pandemic could destroy the economy in China and investors speculated that China would be affected by the pandemic for a long period of time.

According to the data available on the Stockbit official website, which is included in the list of the five countries with the largest index in the world, especially countries from the Asian region, only China and Japan, while Singapore is the country with the highest level of freedom number one and also Malaysia and Indonesia. with the ranking of the level of freedom that still exists above China, it is not included in the group of five countries with the largest index in the world, which means that the data is different from the data on the heritage website and also statements from Gwartney and Lawson.

There are differences in data obtained from the two official websites of The Heritage, Stockbit, a statement from Gwartney and Lawson in 2006 "The higher the level of economic freedom in a country, the more prosperous the country will be" and also the theory of Albert O. Hirschman, namely the capital market developed country capital markets are able to influence developing countries. Therefore, this study aims to see which country's index can have a dominant effect on other countries, and also see what reactions occur between the capital markets of countries in the Asian region, especially for the country that is the subject of this research, namely Japan, China, Singapore, Malaysia, and also Indonesia. In addition to the several things above, this research needs to be done because the data in this study includes data in 2019 which has been affected by the Covid-19 pandemic, so it is a challenge for this research to re-examine it with several methods such as the use of variables, number of samples, period and methods that are different from existing research because existing research data used is not affected by events as big as the Covid-19 pandemic.

Based on the background above, the problems formulated in this study are: (1) How is the influence between the indices of Japan (Nikkei 225), Shanghai (SSEC), Singapore (STI), Malaysia (KLSE), and Indonesia (IHSG)?, (2) From the five capital market indices (Nikkei 225, SSEC, STI, KLSE, and JCI), which capital market index movement has the greatest influence or has the dominant influence?

MATERIAL AND METHOD

Capital market

The capital market has several meanings, namely to buy and sell various financial instruments for the long term such as buying and selling equity or stocks, derivative instruments, and various other instruments, these instruments can be in the form of debt or capital can be issued by private companies or can be from government publications. or other name public authorities. In the capital market there is a stock exchange that functions to operate the capital market. A stock exchange is a party that organizes and provides a system or media to bring together securities buying and selling offers to other parties with the aim that there is securities trading between them. The institution that operates the capital market in Indonesia is the IDX or which stands for the Indonesian Stock Exchange and is run by private parties. The capital market is also influenced by the price index, which is the main indicator that can provide an overview of stock price movements or to see how much fluctuation occurs during inflation. The stock price index can also be defined as a market trend that provides an overview of market conditions whether the market is active or passive. Stock indexes can describe stock performance either individually or cumulatively, so that investors can see how investors behave and channel funds at a macro level through the capital market mechanism. The price indices that will be examined in this study include the JCI from Indonesia, Nikkei 225 from Japan, STI from Singapore, KLSE from Malaysia, SSEC from Shanghai.

Capital Market Integration

Occurrence of dynamic effects on stock prices which mutually influence each other, especially on exchanges from countries that are close to each other. The occurrence of events in a country can have an effect on the country, especially for countries that are in the same region [1]. Capital market integration can be interpreted as a condition when investors in a country can make transactions to buy and sell securities they own without any restrictions from other countries. The integration of the stock market and also the absence of barriers that can provide restrictions for investors to invest their capital allows investors to also invest their shares and own shares from other countries.

The capital market in Indonesia has a relationship with capital markets abroad and initially after investors were allowed to be able to participate in investing their capital in stocks that were listed on the IDX, then foreign investors could invest their capital in exchanges that exist throughout the world, which can have an effect on these exchanges so that they have global linkages between one exchange and another so that it can cause dynamics between the stock prices of one exchange and the stock prices of other exchanges and can also cause the occurrence of the effect of mutually influencing one stock price with other stock prices, especially stock exchanges in countries that are still in the same region or countries that have territories that are close to each other [2]. Countries with strong economies tend to have a dominating effect on countries that have lower economic levels and also countries that have a large capitalization level are definitely more able to dominate in terms of conducting economic transactions.

Integration of the capital market itself can occur when investors in one country can buy or sell without any restrictions from other countries, an example of this is the price of identical securities which will have the same value after being adjusted to the exchange rate in the current currency. According [3].

The capital market can be said to be integrated with each other if the risk and return are comparable in all capital markets regardless of the tax and the prevailing exchange rate. This event causes the total cost of capital to be the same even though it is carried out on a different stock market. An example of a case in capital market integration is that assets that have the same risk and length of maturity have the opportunity to provide the same return even on different markets, with no barriers such as risk premiums from the country, financial assets with the same risk and level of liquidity and also the prevailing exchange rate is expected to produce or obtain the same results even though they have different nationalities and different locations [4].

The higher the correlation between stocks and stock exchanges, the more integrated the world's capital markets will be. The higher the correlation is caused by several factors, including the decreasing bias in portfolio selection caused by diversification, which will further eliminate its benefits. The existing capital market in one country can go hand in hand with the existing capital market in other countries due to the existence of underlying economic factors that can provide an overview of the financial conditions that exist in the world in general and systematically which can affect the market. For example, with the effects of deregulation, market liberalization, and liberalization of the existing financial sector. But on the other hand it is also due to technological developments and also developments that are occurring in the current trade sector, then there are also innovations in goods or services that are increasingly being supported by global or international trading activities carried out by multinational companies. also led to an increase in capital market comovement in countries in the world today.

Contagion Effect

Contagion effect is a situation like a crisis that is happening in a country but this crisis can have an effect on other countries such as countries that are around it or it could be countries that are in the same region as the country that is experiencing the crisis. From several journals it is stated that no country can avoid the contagion effects resulting from the contagin effect. According [5]. and also that globalization in an increasingly advanced and sophisticated era can cause an increase in the amount of capital flows and can create an economic dependency. between one country and another and in the end will also increase the level of transmission or contagion effect. According [6].

The contagion effect itself can actually have several meanings by the world bank as follows. First, for the definition of a contagion effect broadly, namely contagion effect is a general process of shock which ultimately has an impact on other countries as well, this contagion effect can occur in several periods including calm periods and can also occur during a crisis period that is currently happening in that country . The

second is the Restrictive Definition which occurs because of the effect of the relationship from the shock between the two countries but is influenced by external factors, namely outside the fundamental factors and also the general shock that is currently happening. The third is Very Restrictive Definition or usually defined as a change in the transmission mechanism during a crisis period in a country and conclusions can be drawn when there is a rapid increase in the correlation between markets in a country [7].

The cause of the contagion effect can be due to the effect of dependence on the economic sector between one country and another, for example, having the same dependency on the macroeconomic sector or it could be due to cooperation in the trade sector between these countries. Investor behavior can also be a contagion effect, for example, the existence of information asymmetry between investors, and it could also be due to a lack of trust in macroeconomic performance between one country and another. Meanwhile, according to the journal in. According to [8], quoting from Fratzcher the transmission of a crisis that occurred in one country which ultimately had an impact on other countries, one of the reasons was that these countries were still in the same area or close to each other between the affected countries. crisis and other countries.

The contagion effect itself can occur due to the interdependence of one country with another due to similarities in the macroeconomic sector in each of these countries or it can be due to trade relations carried out between each of these countries. Several theories on the Contagion Effect state that no country in the world can avoid the effects of the contagion effect or the effects of transmission. Because an increase in capital flows will create flows of interdependence between one country's economy and another with this interdependence which can increase the potential for transmission from one country that may be affected by a crisis so that the effects can also spread to other countries [9].

This study uses five variables, namely NIKKEI225 which represents Japan, STI which represents Singapore, KLSE which represents Malaysia, SSEC which represents Shanghai and finally IHSG which represents Indonesia. To make it easier to identify the problems to be discussed in this study, the hypotheses of this study are:

- H1: The Shanghai stock index, namely SSEC, the Singapore stock market index, namely STI, the Malaysian stock market index, namely KLSE, and also the Indonesian stock market index, namely the JCI, can have an influence on the Japanese stock market index, namely Nikkei 225.
- H2: The Japanese stock market index, namely the Nikkei 225, the Singapore stock market index, namely STI, the Malaysian stock market index, namely KLSE, and also the Indonesian stock market index, namely the JCI, can have an influence on the Shanghai stock market index, namely SSEC.
- H3: The Japanese stock market index, namely the Nikkei 225, the Shanghai stock market index, namely SSEC, the Malaysian stock market index, namely KLSE, and also the Indonesian stock market index, namely the JCI, can have an influence on the Singapore stock market index, namely STI.
- H4: The Japanese stock market index is the Nikkei 225, the Shanghai stock market index is SSEC, the Singapore stock market index is STI, and the Indonesian stock market index is the IHSG which can have an influence on the Malaysian stock market index, namely KLSE.
- H5: The Japanese stock market index, namely Nikkei 225, the Shanghai stock market index, namely SSEC, the Singapore stock market index, namely STI, and also the Malaysian stock market index, namely KLSE, can have an influence on the Indonesian stock market index, namely the JCI.

Method and Data Collection

The quantitative research approach uses secondary data obtained from several official websites, namely yahoo finance (http://finance.yahoo.com), investing.com (https://www.investing.com) and Indonesia Stock Exchange (www.idx.co.id). Secondary data for the time series data type for the period January 1 2019 to February 28 2023 contains a maximum of 50 data for each variable according to the classification of data collection. The data collection technique in this study (Nikkei 225, SSEC, STI, KLSE and JCI) is to collect price data for the monthly period January 2019 to February 2023. If there are countries whose index moves on national holidays while other countries move. no, then the value of the last closing price before the capital market holiday will be used as the index value, so no data is wasted.

The reason for choosing the Nikkei 225 itself is one of the best performing indexes because it managed to record an increase of 18% to its highest level in 33 years. The rise in the Nikkei 225 was also followed by an increase in the purchases of foreign investors, including Warren Buffett, who added to his shares. in five large trading conglomerates worth $ 15 billion, the reason for choosing STI is because STI itself has a high level of freedom in the economic field compared to countries in other Asian regions, then the reason for choosing KLSE from Malaysia is because KLSE itself has a moderate level of economic freedom and Malaysia is also a country that has cooperation in the field of exports and imports with Singapore, so the reason for choosing the SSEC index originating from Shanghai is because this index is still included in the ranks of the largest indexes. in the world with a market cap of $2.7 trillion, the last index to choose is the JCI which is the Indonesian country index because the JCI itself has a low level of freedom for the Asian region and also because of its location. Indonesia is still in the same Asian region as Malaysia, Singapore, Japan and China. The sampling technique in this study was purposive sampling method, namely the data collected must meet certain criteria. The data criteria taken include that the country is located in the Asian region and also data on the stock prices of these countries is available and can be downloaded on the yahoo finance website, investing.com, and also the Indonesia Stock Exchange.

Data Analysis Method

Data analysis techniques in this study will use two methods, namely VAR or VECM. The VAR method stands for Vector Autoregressive, the choice of this method is to provide an overview of a system that uses time series data as its research object and to determine the dynamic effects of the disturbance factors that exist in the variable system used as a research object. Basically why this study uses the VAR method because the analysis with this method is the same as a model that has simultaneous equations, this occurs because the VAR method considers several endogenous variables simultaneously in a model.

$$\Delta y_t = ae_{t-1} + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \cdots + \beta_p \Delta y_{t-p+1} + \varepsilon_t$$

Where:

Δy_t = Vector of the first derivative of the dependent variable

Δy_{t-1}= Vector of first derivative of dependent variable with lag number 1

ε_{t-1} = Error obtained from the regression equation between Y and X at lag -1 and is commonly called the Error Correction Term (ECT)

ε_t = Residual Vector

a = Cointegration coefficient matrix

β_t = The dependent variable coefficient matrix i, where i = 1, 2, …, p

This method will be used if it fulfills the following conditions, namely the time series data is already stationary at the level level and also the data is not cointegrated. However, if the first method produces non-stationary results, then the analysis is carried out using the VECM which stands for Vector Error Correction Model, with an emphasis on the single root test, to determine the optimal lag (lag length), causality test, cointegration test, test impulse response function and decomposition variance.

RESULT AND DISCUSSION

Research result

The stages of analysis that will be carried out in this study include testing using the E-views10 program by testing the uni root test, determining the optimum lag (lag legth), causality test, cointegration test, VAR or VECM estimation, Impulse Response Function, and Variance Decomposition of the five stock indexes. stocks in the Asian region.

Unit Root Test

The Unit Root test was carried out using the Augmented Dickey-Fuller method with the aim of knowing whether the data obtained from NIKKEI 225, STI, KLSE, SSEC, JCI were at stationary or non-stationary levels. The data obtained can be said to be non-stationary if the ADF t-statistic value is smaller than the critical value of the Mackinnon t-statistic distribution, and vice versa. If the data obtained already shows that it is stationary at the level then no further testing will be carried out to the difference level, but if the level is still not stationary then it is necessary to do a stationarity test at the 1^stdifference level. Then if at the first difference level it is still not at the stationary level, it is necessary to carry out a stationary test at the 2nd difference level up to the stationary level.

Table 1. NIKKEI 225 Unit Root Level & 1st Difference Test Results

Null Hypothesis: HARGA_TERAKHIR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.587814	0.4811
Test critical values:	1% level	-3.571310	
	5% level	-2.922449	
	10% level	-2.599224	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HARGA_TERAKHIR)
Method: Least Squares
Date: 07/20/23 Time: 13:44
Sample (adjusted): 2019M02 2023M02
Included observations: 49 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HARGA_TERAKHIR(-1)	-0.084406	0.053159	-1.587814	0.1190
C	2253.486	1343.869	1.676864	0.1002

R-squared	0.050911	Mean dependent var	136.1647
Adjusted R-squared	0.030717	S.D. dependent var	1185.713
S.E. of regression	1167.360	Akaike info criterion	17.00284
Sum squared resid	64048276	Schwarz criterion	17.08005
Log likelihood	-414.5695	Hannan-Quinn criter.	17.03213
F-statistic	2.521154	Durbin-Watson stat	2.142942
Prob(F-statistic)	0.119034		

Null Hypothesis: D(HARGA_TERAKHIR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.577102	0.0000
Test critical values:	1% level	-3.574446	
	5% level	-2.923780	
	10% level	-2.599925	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HARGA_TERAKHIR,2)
Method: Least Squares
Date: 07/20/23 Time: 13:38
Sample (adjusted): 2019M03 2023M02
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HARGA_TERAKHIR(-1))	-1.108648	0.146316	-7.577102	0.0000
C	141.0925	174.6343	0.807931	0.4233

R-squared	0.555179	Mean dependent var	-10.27542
Adjusted R-squared	0.545509	S.D. dependent var	1782.902
S.E. of regression	1201.959	Akaike info criterion	17.06207
Sum squared resid	66456503	Schwarz criterion	17.14003
Log likelihood	-407.4896	Hannan-Quinn criter.	17.09153
F-statistic	57.41247	Durbin-Watson stat	2.044308
Prob(F-statistic)	0.000000		

Sources: Raw data, processed

Based on the results of the unit root test at NIKKEI 225, it was found that the level level test was still not stationary, so the test was continued at the first difference level and obtained stationary results.

Table 2. STI Unit Root Level & 1st Difference Test Results

Null Hypothesis: TERAKHIR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.833579	0.3603
Test critical values:	1% level	-3.571310	
	5% level	-2.922449	
	10% level	-2.599224	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TERAKHIR)
Method: Least Squares
Date: 07/20/23 Time: 14:10
Sample (adjusted): 2019M02 2023M02
Included observations: 49 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TERAKHIR(-1)	-0.136808	0.074612	-1.833579	0.0731
C	420.1669	229.2257	1.832984	0.0731

R-squared	0.066757	Mean dependent var	1.478776
Adjusted R-squared	0.046901	S.D. dependent var	143.9503
S.E. of regression	140.5341	Akaike info criterion	12.76874
Sum squared resid	928242.0	Schwarz criterion	12.84595
Log likelihood	-310.8341	Hannan-Quinn criter.	12.79803
F-statistic	3.362010	Durbin-Watson stat	2.174432
Prob(F-statistic)	0.073053		

Null Hypothesis: D(TERAKHIR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.020209	0.0000
Test critical values:	1% level	-3.574446	
	5% level	-2.923780	
	10% level	-2.599925	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TERAKHIR,2)
Method: Least Squares
Date: 07/20/23 Time: 14:15
Sample (adjusted): 2019M03 2023M02
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TERAKHIR(-1))	-1.171505	0.146069	-8.020209	0.0000
C	1.667483	20.91532	0.079725	0.9368

R-squared	0.583045	Mean dependent var	-2.615833
Adjusted R-squared	0.573981	S.D. dependent var	221.9366
S.E. of regression	144.8583	Akaike info criterion	12.83016
Sum squared resid	965260.8	Schwarz criterion	12.90813
Log likelihood	-305.9239	Hannan-Quinn criter.	12.85963
F-statistic	64.32375	Durbin-Watson stat	1.983655
Prob(F-statistic)	0.000000		

Sources: Raw data, processed

Based on the results of the unit root test at STI, it was found that the level level test was still not stationary, so the test was continued at the first difference level and obtained stationary results.

Table 3. KLSE Unit Root Level & 1st Difference Test Results

Null Hypothesis: HARGA_TERAKHIR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.980438	0.0438
Test critical values:	1% level	-3.571310	
	5% level	-2.922449	
	10% level	-2.599224	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HARGA_TERAKHIR)
Method: Least Squares
Date: 07/20/23 Time: 14:24
Sample (adjusted): 2019M02 2023M02
Included observations: 49 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HARGA_TERAKHIR(-1)	-0.299682	0.100550	-2.980438	0.0045
C	460.0186	156.0977	2.946991	0.0050

R-squared	0.158957	Mean dependent var	-4.680408
Adjusted R-squared	0.141063	S.D. dependent var	56.82289
S.E. of regression	52.66281	Akaike info criterion	10.80566
Sum squared resid	130348.5	Schwarz criterion	10.88287
Log likelihood	-262.7386	Hannan-Quinn criter.	10.83495
F-statistic	8.883013	Durbin-Watson stat	2.159903
Prob(F-statistic)	0.004547		

Null Hypothesis: D(HARGA_TERAKHIR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.650977	0.0000
Test critical values:	1% level	-3.574446	
	5% level	-2.923780	
	10% level	-2.599925	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HARGA_TERAKHIR,2)
Method: Least Squares
Date: 07/20/23 Time: 14:25
Sample (adjusted): 2019M03 2023M02
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HARGA_TERAKHIR(-1))	-1.238245	0.143134	-8.650977	0.0000
C	-6.264994	8.135707	-0.770061	0.4452

R-squared	0.619329	Mean dependent var	-1.156458
Adjusted R-squared	0.611054	S.D. dependent var	90.14139
S.E. of regression	56.21716	Akaike info criterion	10.93709
Sum squared resid	145377.0	Schwarz criterion	11.01506
Log likelihood	-260.4903	Hannan-Quinn criter.	10.96656
F-statistic	74.83939	Durbin-Watson stat	1.997221
Prob(F-statistic)	0.000000		

Sources: Raw data, processed

Based on the results of the unit root test at KLSE, it was found that the level level test was still not stationary, so the test was continued at the first difference level and obtained stationary results.

Table 4. SSEC Unit Root Level & 1st Difference Test Results

Null Hypothesis: HARGA_TERAKHIR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.661609	0.0881
Test critical values:	1% level	-3.571310	
	5% level	-2.922449	
	10% level	-2.599224	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HARGA_TERAKHIR)
Method: Least Squares
Date: 07/20/23 Time: 14:38
Sample (adjusted): 2019M02 2023M02
Included observations: 49 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HARGA_TERAKHIR(-1)	-0.189491	0.071194	-2.661609	0.0106
C	618.9722	228.0296	2.714438	0.0093

R-squared	0.130984	Mean dependent var	14.18449
Adjusted R-squared	0.112494	S.D. dependent var	142.0881
S.E. of regression	133.8577	Akaike info criterion	12.67139
Sum squared resid	842140.3	Schwarz criterion	12.74861
Log likelihood	-308.4491	Hannan-Quinn criter.	12.70069
F-statistic	7.084162	Durbin-Watson stat	1.798094
Prob(F-statistic)	0.010610		

Null Hypothesis: D(HARGA_TERAKHIR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.370550	0.0000
Test critical values:	1% level	-3.574446	
	5% level	-2.923780	
	10% level	-2.599925	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HARGA_TERAKHIR,2)
Method: Least Squares
Date: 07/20/23 Time: 14:39
Sample (adjusted): 2019M03 2023M02
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HARGA_TERAKHIR(-1))	-1.017374	0.138032	-7.370550	0.0000
C	7.298324	19.70649	0.370351	0.7128

R-squared	0.541490	Mean dependent var	-6.925833
Adjusted R-squared	0.531523	S.D. dependent var	198.5148
S.E. of regression	135.8743	Akaike info criterion	12.70211
Sum squared resid	849243.7	Schwarz criterion	12.78008
Log likelihood	-302.8507	Hannan-Quinn criter.	12.73157
F-statistic	54.32500	Durbin-Watson stat	2.103401
Prob(F-statistic)	0.000000		

Sources: Raw data, processed

Based on the results of the unit root test at SSEC, it was found that the level level test was still not stationary so that the test was continued at the first difference level and obtained stationary results.

Table 5. JCI Unit Root Level & 1st Difference Test Results

Null Hypothesis: HARGA_TERAKHIR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.052129	0.7272
Test critical values:	1% level	-3.571310	
	5% level	-2.922449	
	10% level	-2.599224	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HARGA_TERAKHIR)
Method: Least Squares
Date: 07/20/23 Time: 14:52
Sample (adjusted): 2019M02 2023M02
Included observations: 49 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HARGA_TERAKHIR(-1)	-0.051626	0.049068	-1.052129	0.2981
C	325.9209	305.7217	1.066071	0.2918

R-squared	0.023011	Mean dependent var	6.332041
Adjusted R-squared	0.002224	S.D. dependent var	242.6585
S.E. of regression	242.3886	Akaike info criterion	13.85892
Sum squared resid	2761355.	Schwarz criterion	13.93614
Log likelihood	-337.5436	Hannan-Quinn criter.	13.88822
F-statistic	1.106976	Durbin-Watson stat	1.661600
Prob(F-statistic)	0.298120		

Null Hypothesis: D(HARGA_TERAKHIR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.877820	0.0000
Test critical values:	1% level	-3.574446	
	5% level	-2.923780	
	10% level	-2.599925	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HARGA_TERAKHIR,2)
Method: Least Squares
Date: 07/20/23 Time: 14:53
Sample (adjusted): 2019M03 2023M02
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HARGA_TERAKHIR(-1))	-0.856170	0.145661	-5.877820	0.0000
C	7.413017	35.35811	0.209655	0.8349

R-squared	0.428917	Mean dependent var	1.948333
Adjusted R-squared	0.416503	S.D. dependent var	320.5826
S.E. of regression	244.8835	Akaike info criterion	13.88022
Sum squared resid	2758524.	Schwarz criterion	13.95818
Log likelihood	-331.1252	Hannan-Quinn criter.	13.90968
F-statistic	34.54877	Durbin-Watson stat	2.009814
Prob(F-statistic)	0.000000		

Sources: Raw data, processed

Based on the results of the unit root test at JCI, it was found that the level level test was still not stationary so that the test was continued at the first difference level and obtained stationary results.

The results of stationarity tests on NIKKEI 225, STI, KLSE, SSEC, JCI show that all indices of the five countries are not stationary at level level, but all indexes are stationary at first difference level.

Optimum Lag Determination (Lag Length)

The Lag Length test serves to determine the length of the period of mutual influence between variables with variables in the past or with other variables. Lag Length Optimum can also be seen from the Akaike Information Criterion (AIC) value with the minimum value. Following are the results of the Optimum Lag or Lag Length test using E-Views10:

Table 6. Lag Length

VAR Lag Order Selection Criteria
Endogenous variables: LIHSG LKLSE LNIKKEI225 LSSEC LSTI
Exogenous variables:
Date: 07/23/23 Time: 21:22
Sample: 2019M01 2023M02
Included observations: 44

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-1413.772	NA	1.75e+22	65.39871	66.41246*	65.77466
2	-1392.686	32.58764	2.16e+22	65.57662	67.60410	66.32851
3	-1374.118	24.47501	3.21e+22	65.86901	68.91025	66.99685
4	-1343.812	33.06181	3.13e+22	65.62780	69.68278	67.13158
5	-1300.842	37.11034	2.08e+22	64.81099	69.87971	66.69072
6	-1246.419	34.63252	1.14e+22*	63.47360*	69.55607	65.72927*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Sources: Raw data, processed

Based on the test results, the recommended optimal lag results are lag 6 because it has the most stars than the other lags and also the minimum Akaike Information Criterion (AIC) value.

Causality Test

The causality test is used to see the direction of the relationship between variables by comparing the probability value with the critical value. The results of the causality test with a probability value of less than 0.05 can mean that there is a significant effect between one independent variable on the dependent variable and if the probability value is more than 0.05 it can be interpreted that there is no significant effect between one independent variable on another dependent variable.

Table 7. Causality Test Results

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 07/20/23 Time: 17:37
Sample: 2019M01 2023M02
Included observations: 48

Dependent variable: LNIKKEI225

Excluded	Chi-sq	df	Prob.
LKLSE	0.167991	2	0.9194
LSSEC	0.331946	2	0.8471
LSTI	4.393506	2	0.1112
LIHSG	4.421633	2	0.1096
All	11.57388	8	0.1713

Dependent variable: LKLSE

Excluded	Chi-sq	df	Prob.
LNIKKEI225	0.684279	2	0.7102
LSSEC	2.773511	2	0.2499
LSTI	3.136748	2	0.2084
LIHSG	1.173334	2	0.5562
All	11.51749	8	0.1741

Dependent variable: LSSEC

Excluded	Chi-sq	df	Prob.
LNIKKEI225	16.90448	2	0.0002
LKLSE	7.021217	2	0.0299
LSTI	4.526231	2	0.1040
LIHSG	1.484802	2	0.4760
All	22.94276	8	0.0034

Dependent variable: LSTI

Excluded	Chi-sq	df	Prob.
LNIKKEI225	0.849110	2	0.6541
LKLSE	0.754411	2	0.6858
LSSEC	0.104958	2	0.9489
LIHSG	4.884255	2	0.0870
All	10.94734	8	0.2047

Dependent variable: LIHSG

Excluded	Chi-sq	df	Prob.
LNIKKEI225	0.191803	2	0.9086
LKLSE	0.097170	2	0.9526
LSSEC	1.637080	2	0.4411
LSTI	1.791870	2	0.4082
All	5.755159	8	0.6746

Sources: Raw data, processed

From the results of the causality test it can be seen that NIKKEI 225 has a unidirectional relationship with SSEC namely NIKKEI 225 does not have a significant effect on SSEC but SSEC has a significant influence on NIKKEI 225. NIKKEI 225 does not have a significant effect on STI as well as STI which does not have significant influence on NIKKEI 225. NIKKEI 225 does not have a significant influence on KLSE as well as KLSE which does not have a significant influence on NIKKEI 225. NIKKEI 225 and JCI also do not have a significant effect on each other between NIKKEI 225 on JCI or vice versa JCI against NIKKEI 225. Then SSEC with the same STI did not give each other a significant influence between SSEC on STI or vice versa STI on SSEC. SSEC has a one-way relationship with KLSE namely SSEC has a significant influence on KLSE but KLSE does not have a significant influence on SSEC. SSEC does not have a significant effect on the JCI as well as the JCI which does not have a significant effect on SSEC. Furthermore, STI does not have a significant influence on KLSE as well as KLSE which does not have a significant influence on STI. STI does not have a significant effect on the JCI as well as the JCI which does not have a significant effect on the STI. Meanwhile, the KLSE relationship did not have a significant effect on the JCI as well as the JCI which did not have a significant relationship with the KLSE.

Cointegration Test

Cointegration test to determine the possibility of the existence of a relationship between variables, especially variables for the long term. When carrying out this cointegration test, it is necessary to determine the recommended deterministic specifications, namely the Akaike Information Criterion (AIC) and also the Schwarz Information Criterion (SC). Then the criteria chosen for the cointegration test are AIC and then carry out statistical tests, namely the Trace Test and Maximum Eigenvalue Test.

Table 8. Johansen Method Cointegration Test

Date: 07/23/23 Time: 21:33
Sample (adjusted): 2019M08 2023M02
Included observations: 43 after adjustments
Trend assumption: No deterministic trend
Series: LIHSG LKLSE LNIKKEI225 LSSEC LSTI
Lags interval (in first differences): 1 to 6

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.982233	256.2684	60.06141	0.0000
At most 1 *	0.646665	82.96002	40.17493	0.0000
At most 2 *	0.478042	38.22548	24.27596	0.0005
At most 3	0.151549	10.26828	12.32090	0.1078
At most 4	0.071750	3.201522	4.129906	0.0871

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.982233	173.3083	30.43961	0.0001
At most 1 *	0.646665	44.73454	24.15921	0.0000
At most 2 *	0.478042	27.95720	17.79730	0.0011
At most 3	0.151549	7.066760	11.22480	0.2437
At most 4	0.071750	3.201522	4.129906	0.0871

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Sources: Raw data, processed

Based on the results of the Cointegration Test with the Johansen method, the results of the Cointegration Rank Test (Trace) with the results of the probability values in the None and also At Most 1 lines are 0.0000 and 0.0000 respectively, which are smaller than 0.05 so that it can be interpreted that there is a cointegration equation which means having a balance long term, then the results of the Cointegration Rank Test (Maximum Eigenvalue) with the results of the probability values in the None and At Most 1 rows are 0.0001 and 0.0000 respectively, which is less than 0.05 so that it can be interpreted that there is cointegration which means having a long-term balance. Furthermore, from the results table of the Cointegration Rank Test (Trace & Maximum Eigenvalue) it is also known that there are three cointegration equations in the Cointegration Rank Test (Trace) and also the Cointegration Rank Test (Maximum Eigenvalue).

VECM estimation

Because the data obtained were not stationary at the level but stationary at the 1^stdifference level and proved to be cointegrated, the VECM estimate was chosen. By using a total sample of 50 with 5 variables and an a value of 5%, the calculation results are obtained to find the t-table value using the help of the Excel application.

Table 9. Calculation t-table

Perhitungan Nilai Kritis t	
n (Number of Observations)	50
df= n-1	49
Significance Level	0.05
Critical Value t (TINV(… , …))	*2.009575237*

Sources: Raw data, processed

From the results of calculations using the Excel application, it is found that the critical value of t or the t-table value is 2.009575. In testing the VECM estimation, it can be said that there is a short-term relationship or a long-term relationship if the t-statistic value is greater than the t-table value, then it has an effect. If the t-statistic value is less than the t-table value, it has no effect.

Table 10. Long Term VECM Estimation

Vector Error Correction Estimates
Date: 07/23/23 Time: 22:17
Sample (adjusted): 2019M03 2023M02
Included observations: 48 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LIHSG(-1)	1.000000
LKLSE(-1)	-25.08258 (4.26798) [-5.87692]
LNIKKEI225(-1)	-1.405745 (0.20751) [-6.77448]
LSSEC(-1)	15.68968 (2.23639) [7.01564]
LSTI(-1)	5.740761 (1.60427) [3.57842]

Sources: Raw data, processed

Based on the long-term VECM estimation table, it can be seen that KLSE has a significant influence on the JCI because the t statistic value is -5.87692 which means it is greater than the t table value, which is 2.009575, NIKKEI 225 has a significant influence on the JCI because the t statistic value is - 6.77448 which means it is greater than the t table value, which is 2.009575, SSEC has a significant influence on the JCI

because the t statistic value is 7.01564 which means it is greater than the t table value, which is 2.009575, and finally, STI also has a significant influence on the JCI because the value The t statistic is 3.57842 which means it is greater than the t table value, which is 2.009575.

Table 11. Short Term VECM Estimation

Error Correction:	D(LIHSG)	D(LKLSE)	D(LNIKKEI2...	D(LSSEC)	D(LSTI)
CointEq1	0.013588	0.003907	0.053618	-0.046433	0.000209
	(0.02383)	(0.00523)	(0.11212)	(0.01080)	(0.01347)
	[0.57014]	[0.74712]	[0.47821]	[-4.30124]	[0.01551]
D(LIHSG(-1))	0.148471	0.024493	1.616149	0.024142	0.194241
	(0.21891)	(0.04803)	(1.02985)	(0.09915)	(0.12376)
	[0.67823]	[0.50993]	[1.56930]	[0.24348]	[1.56951]
D(LKLSE(-1))	0.140409	-0.230173	-0.429885	-0.097342	-0.142901
	(0.89828)	(0.19709)	(4.22596)	(0.40688)	(0.50784)
	[0.15631]	[-1.16783]	[-0.10172]	[-0.23924]	[-0.28139]
D(LNIKKEI225(-1))	0.044951	0.003006	0.004744	-0.041923	0.029702
	(0.04593)	(0.01008)	(0.21607)	(0.02080)	(0.02597)
	[0.97870]	[0.29828]	[0.02195]	[-2.01519]	[1.14389]
D(LSSEC(-1))	-0.333735	-0.128153	0.586018	0.201983	0.005317
	(0.30297)	(0.06648)	(1.42532)	(0.13723)	(0.17128)
	[-1.10154]	[-1.92783]	[0.41115]	[1.47186]	[0.03104]
D(LSTI(-1))	-0.180142	0.067314	-3.583488	-0.080941	-0.500503
	(0.35927)	(0.07883)	(1.69016)	(0.16273)	(0.20311)
	[-0.50142]	[0.85395]	[-2.12021]	[-0.49740]	[-2.46421]
R-squared	0.055909	0.169337	0.124793	0.357737	0.145017
Adj. R-squared	-0.056483	0.070449	0.020602	0.281277	0.043233
Sum sq. resids	2659499.	128032.5	58860372	545626.0	850015.0
S.E. equation	251.6374	55.21226	1183.823	113.9785	142.2619
F-statistic	0.497446	1.712405	1.197733	4.678746	1.424755
Log likelihood	-330.2478	-257.4412	-404.5765	-292.2328	-302.8724
Akaike AIC	14.01032	10.97672	17.10735	12.42637	12.86969
Schwarz SC	14.24422	11.21062	17.34125	12.66027	13.10359
Mean dependent	8.331042	-5.282083	126.2583	7.055417	1.040417
S.D. dependent	244.8184	57.26626	1196.210	134.4442	145.4406

Sources: Raw data, processed

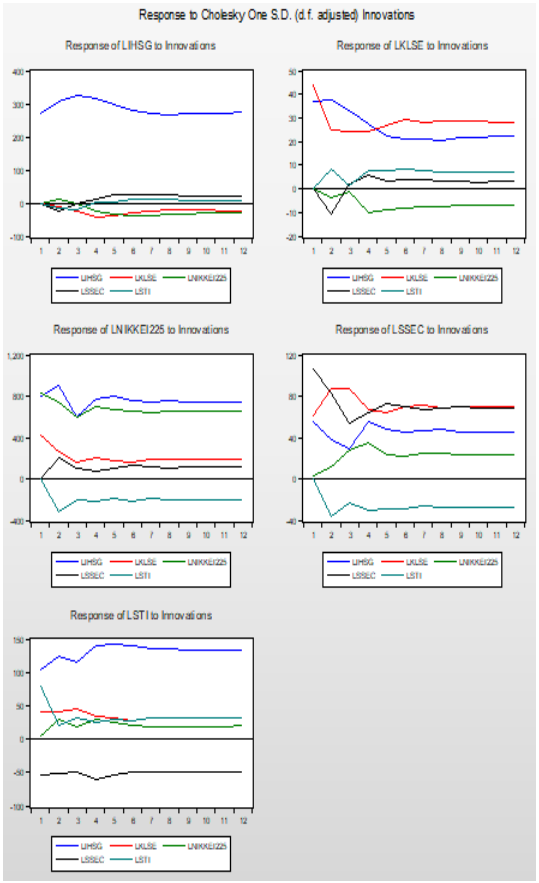
Based on the short-term VECM estimation test, it was found that the influence of the SSEC, STI, KLSE, and IHSG indices on NIKKEI 225 was that the SSEC, KLSE, IHSG indexes did not have a significant effect on NIKKEI 225, only STI had a significant effect on NIKKEI 225. The effect of the NIKKEI 225 index, STI, KLSE, and IHSG on SSEC are NIKKEI 225 which have a significant effect on SSEC but for the STI, KLSE, JCI index they have no significant effect on SSEC. Then the influence of the NIKKEI 225, SSEC, KLSE, and JCI indexes on STI is NIKKEI 225, SSEC, KLSE, JCI has no significant effect on STI. Furthermore, the effect of the NIKKEI 225, SSEC, STI, and JCI on KLSE is NIKKEI 225, SSE, STI, JCI has no significant effect on KLSE. And finally the effect of the NIKKEI 225, SSEC, STI and KLSE index on the JCI is NIKKEI 225, SSEC, STI, KLSE none of which have a significant effect on the JCI.

Impulse Response Function (IRF)

The Impulse Response Function (IRF) aims to examine the shock response or shock of the innovation variable to other variables. The assumption using each variable is not correlated with one another so that the effect of a shock can be direct.

Images from IRF will show the response of a variable due to the shock of other variables up to several periods after the shock. If the IRF image shows a movement that approaches the balance point which is usually called convergence or a return to the previous balance, it means that the response of a variable due to the shock that occurs over time will disappear so that it can be interpreted that the shock that occurs does not leave a permanent effect on that variable.

Table 12. IRF results



Sources: Raw data, processed

Based on the IRF results image using 10 periods, it can be seen that the JCI response to KLSE and NIKKEI 225 was negative but positive to SSEC and STI. KLSE's response to JCI, SSEC, and LSI was positive and only negative at NIKKEI225. NIKKEI225's response to JCI, KLSE, SSEC was positive and only negative on STI. SSEC's response to JCI, KLSE, NIKKEI 225 was positive and only negative on STI. For the last response, the response from STI to JCI, KLSE, NIKKEI 225 was positive and only negative on SSEC.

Variance Decomposition (VD)

Variance Decomposition decomposes the variation of one endogenous variable into the shock components of other endogenous variables in the current and future periods.

Table 13. Variance Decomposition Result

Variance Decomposition of LIHSG:

Period	S.E.	LIHSG	LKLSE	LNIKKEI225	LSSEC	LSTI
1	271.3652	100.0000	0.000000	0.000000	0.000000	0.000000
2	411.5015	99.27683	0.071255	0.094323	0.420198	0.137390
3	526.6898	99.18600	0.289037	0.059530	0.259402	0.206029
4	617.1483	98.68365	0.744713	0.204543	0.217002	0.150096
5	687.2695	98.31049	0.885281	0.391950	0.289835	0.122442
6	744.1411	97.96984	0.908717	0.624302	0.372522	0.124622
7	793.4234	97.78911	0.895829	0.764690	0.425707	0.124660
8	838.6960	97.68881	0.868803	0.854067	0.464223	0.124092
9	881.7525	97.63820	0.847661	0.909620	0.484457	0.120058
10	923.2458	97.61827	0.829492	0.943450	0.493584	0.115206
11	963.6318	97.60830	0.817138	0.966552	0.497865	0.110147
12	1002.726	97.59829	0.809223	0.985865	0.501001	0.105625

Variance Decomposition of LKLSE:

Period	S.E.	LIHSG	LKLSE	LNIKKEI225	LSSEC	LSTI
1	57.42857	41.66705	58.33295	0.000000	0.000000	0.000000
2	74.12563	50.36660	46.06029	0.246085	2.102188	1.224838
3	84.80400	53.62781	43.54855	0.204992	1.654852	0.963801
4	93.57669	52.74674	42.57873	1.410210	1.761478	1.502842
5	100.5467	50.54170	43.96289	2.004691	1.648868	1.841854
6	107.4759	48.10090	45.78761	2.328263	1.582887	2.200340
7	113.6494	46.38212	47.12536	2.557287	1.527402	2.407833
8	119.5260	44.85918	48.45031	2.685029	1.463169	2.542314
9	125.2183	43.80599	49.41400	2.755845	1.388249	2.635911
10	130.6577	43.04989	50.12475	2.799764	1.321002	2.704588
11	135.9035	42.46497	50.67029	2.842074	1.267359	2.755304
12	140.9556	41.97140	51.11651	2.886357	1.221175	2.804556

Variance Decomposition of LNIKKEI225:

Period	S.E.	LIHSG	LKLSE	LNIKKEI225	LSSEC	LSTI
1	1232.028	42.53255	12.05656	45.41088	0.000000	0.000000
2	1759.552	47.38347	8.027958	40.13780	1.247023	3.203748
3	1971.127	46.98707	7.024117	41.11709	1.295918	3.575805
4	2250.010	47.69425	6.206676	41.27111	1.095155	3.732809
5	2491.996	49.05564	5.512392	40.77868	1.061262	3.592027
6	2700.074	49.58552	5.067803	40.51183	1.122432	3.712416
7	2886.311	49.90853	4.857284	40.40088	1.139748	3.693560
8	3067.205	50.17595	4.654750	40.34175	1.135645	3.691898
9	3235.523	50.34835	4.499293	40.30824	1.151671	3.692444
10	3394.878	50.48144	4.376004	40.27720	1.163576	3.701782
11	3547.439	50.58428	4.279105	40.26713	1.166537	3.702953
12	3694.664	50.68128	4.191691	40.25139	1.169021	3.706616

Variance Decomposition of LSSEC:

Period	S.E.	LIHSG	LKLSE	LNIKKEI225	LSSEC	LSTI
1	133.6027	16.99086	20.63260	0.060271	62.31627	0.000000
2	187.9627	12.77057	32.15690	0.399585	51.06361	3.609338
3	219.2850	11.13148	39.61901	1.821299	43.66832	3.759891
4	248.5606	13.58859	38.10640	3.344272	40.52188	4.438865
5	273.6416	14.23176	37.02597	3.485549	40.50390	4.752819
6	296.4089	14.43705	37.07948	3.513334	39.97862	4.991519
7	317.3768	14.75633	37.30880	3.648175	39.25341	5.033293
8	337.4544	15.05518	37.17604	3.758036	38.87767	5.133070
9	356.1568	15.14343	37.14517	3.790628	38.72316	5.197606
10	373.9067	15.21067	37.19257	3.831928	38.51418	5.250661
11	390.8761	15.28635	37.22924	3.877896	38.31859	5.287919
12	407.1658	15.35255	37.23363	3.915086	38.17084	5.327887

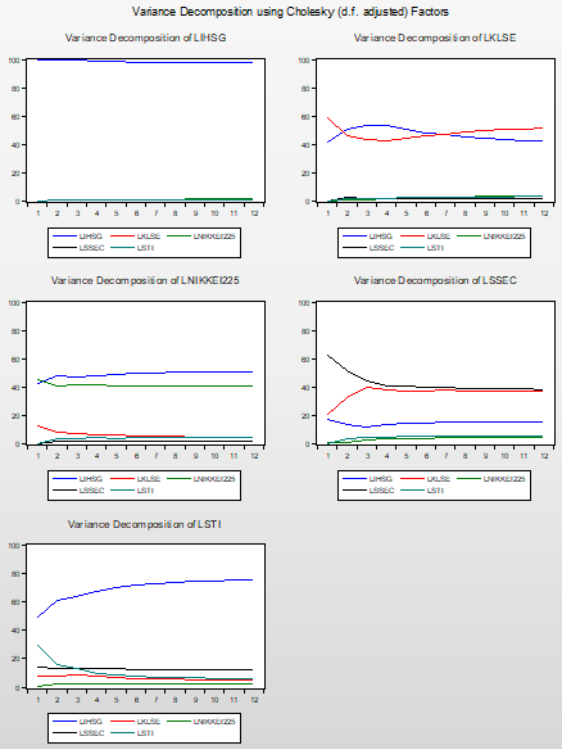
Variance Decomposition of LSTI:

Period	S.E.	LIHSG	LKLSE	LNIKKEI225	LSSEC	LSTI
1	148.0709	49.46001	7.487399	0.155209	13.59020	29.30718
2	207.1633	61.12978	7.761851	2.209312	12.95145	15.94761
3	249.3418	63.71736	8.541504	2.005173	13.01850	12.71747
4	296.7601	67.24615	7.334465	2.370879	13.35313	9.695381
5	337.3766	69.85492	6.525146	2.411114	12.92716	8.281665
6	371.5923	71.94450	5.935892	2.272264	12.44465	7.402695
7	401.4383	72.97021	5.680857	2.150896	12.23194	6.966099
8	429.3477	73.72780	5.516294	2.078165	12.05532	6.622417
9	454.9037	74.26101	5.404896	2.020040	11.92437	6.389688
10	478.9256	74.66944	5.332713	1.978782	11.82835	6.190717
11	501.9017	74.97490	5.278512	1.948411	11.76728	6.030897
12	524.0140	75.24351	5.226582	1.927680	11.71611	5.886123

Cholesky Ordering: LIHSG LKLSE LNIKKEI225 LSSEC LSTI

Sources: Raw data, processed

Figure 1. Variance Decomposition Result



Sources: Raw data, processed

Based on the Variance Decomposition results, it was found that the JCI variable was influenced by the JCI itself by 100%, then for the second period the effect slightly decreased at 99,276% but still dominated, then for the next period up to the twelfth period the JCI was influenced by KLSE by 0.809%, NIKKEI 225 of 0.985%, SSEC of 0.501%, and STI of 0.105%. The KLSE variable is influenced by KLSE itself by 58,332%, then for the second period the effect slightly decreases to 46,060% but in the next period it remains in the range of 46,060% to 51,116%, then for the next period up to the twelfth period it is influenced by the JCI of 41,971% , NIKKEI 225 of 2,886%, SSEC of 1,221%, and STI of 2,804%. For NIKKEI 225, it was influenced by NIKKEI 225 itself by 45,410%, then for the second period, the effect decreased slightly to 40,137%, but in the following period it remained between 40,137% and 40,251%, then for the next period, up to the twelfth period, it was influenced by the JCI of 50,681%. KLSE is 4.191%, SSEC is 1.169% and STI is 3.706%. Furthermore, the SSEC variable was influenced by SSEC itself by 62,316% then for the second period the effect decreased slightly to 51,063 but in the following period it decreased again to 31,170, then for the next period up to the twelfth

period it was influenced by the JCI of 15,352%, KLSE of 37,233 %, NIKKEI 225 of 3,915%, and STI of 5,327%. Finally, the STI variable is influenced by the STI itself by 29,307% then for the second period it has decreased to 15,947% but in the following period it has decreased again to 5,886%, then for the next period up to the twentieth period it is influenced by the IHSG of 75,243%, KLSE of 5,226%, NIKKEI 225 of 1,927% and SSEC of 11,716%.

Hypothesis Test

Based on the results of data testing using the application from E-Views10 in the form of testing with the uni root test method, determining the optimum lag (lag legth), causality test, cointegration test, VAR or VECM estimation, Impulse Response Function, and Variance Decomposition of the five stock market indices in the Asian region, data is obtained whether the test results are in accordance with the hypothesis or not.

Hypothesis 1: The Shanghai stock market index, namely SSEC, the Singapore stock market index, namely STI, the Malaysian stock market index, namely KLSE, and also the Indonesian stock market index, namely the JCI, can have an influence on the Japanese stock market index, namely Nikkei 225. Based on the test results, the results obtained that the SSEC stock market can influence NIKKEI 225 with a percentage of 1,169%, the STI stock market can influence NIKKEI 225 with a percentage of 3,706%, the KLSE stock market can influence NIKKEI 225 with a percentage of 4,191% and the IHSG stock market can also influence NIKKEI 225 with a percentage of 50,681%.

Hypothesis 2: The Japanese stock market index, namely the Nikkei 225, the Singapore stock market index, namely STI, the Malaysian stock market index, namely KLSE, and also the Indonesian stock market index, namely the JCI, can have an influence on the Shanghai stock market index, namely SSEC. Based on the test results, the results show that the NIKKEI 225 stock market can influence SSEC with a percentage of 3,915%, the STI stock market can affect SSEC with a percentage of 5,327%, the KLSE stock market can affect SSEC with a percentage of 37,233%, and the IHSG stock market can also affect SSEC by percentage of 15.352%.

Hypothesis 3: The Japanese stock market index, namely the Nikkei 225, the Shanghai stock market index, namely SSEC, the Malaysian stock market index, namely KLSE, and also the Indonesian stock market index, namely the JCI can have an influence on the Singapore stock market index, namely STI. Based on the test results, the results show that the NIKKEI 225 stock market can influence STI with a percentage of 1,927%, the SSEC stock market can influence STI with a percentage of 11,716%, the KLSE stock market can influence STI with a percentage of 5,226%, and the IHSG stock market can also influence STI by percentage of 75.243%.

Hypothesis 4: The Japanese stock market index, namely the Nikkei 225, the Shanghai stock market index, namely SSEC, the Singapore stock market index, namely STI, and the Indonesian stock market index, namely the IHSG can have an influence on the Malaysian stock market index, namely KLSE. Based on the test results, it was found that the stock market NIKKEI 225 shares can influence KLSE with a percentage of 2,886%, the SSEC stock market can influence KLSE with a percentage of 1,221%, the STI stock market can influence KLSE with a percentage of 2,804%, and the IHSG stock market can also affect KLSE with a percentage of 41,971%.

Hypothesis 5: The Japanese stock market index, namely Nikkei 225, the Shanghai stock market index, namely SSEC, the Singapore stock market index, namely STI, and also the Malaysian stock market index, namely KLSE, can influence the Indonesian stock market index, namely the JCI. Based on the test results, the results show that the NIKKEI 225 stock market can influence the JCI by a percentage of 0.985%, the SSEC stock market can influence the JCI by a percentage of 0.501%, the STI stock market can influence the JCI by a percentage of 0.105%, and the KLSE stock market can also influence the JCI by percentage of 0.809%.

Discussion

After conducting research and testing hypotheses on five index prices from five countries in the Asian Region, namely NIKKEI 225 representing Japan, STI representing Singapore, KLSE representing Malaysia, SSEC representing Shanghai, and the JCI representing Indonesia, it will be discussed as follows:

The Influence of the SSEC, STI, KLSE, and IHSG Indices on NIKKEI 225

Based on the VECM estimation results, SSEC in the short term has no potential contagion effect to the Nikkei 225, but in the long term it is still possible to be affected by the contagion effect. However, Nikkei 225 will respond positively to the shock from SSEC. Shanghai has no significant effect on Japan because Japan is a country whose index has a higher market capitalization value than Shanghai. In addition, the growth rate of export-import is still relatively stable so that this can still be controlled by Japan. Even though Japan does not have the potential to be influenced by Shanghai in the short term, in the long term it does not rule out the possibility that it can still be potentially influenced by Shanghai.

Based on the VECM estimation, in the short term STI has the potential to contagion effect to the Nikkei 225. However, the Nikkei 225 will respond positively to the shock from STI. Singapore has a significant influence on Japan in the short term because Singapore itself is a developed country that can optimize all economic sectors in the country. So even though Japan is a country whose index has the largest market capitalization value in the Asian Region. Japan still has the potential to be influenced by Singapore in the short term.

Based on VECM estimates, KLSE in the short and long term has no potential contagion effect to the Nikkei 225. However, the Nikkei 225 will respond negatively to the KLSE shock. Malaysia has no significant effect on Japan because Japan is a country whose index has the largest market capitalization value in Asia. In addition, Japanese exports and imports to Malaysia are not that high.

Based on the VECM estimation, the JCI in the short term has no potential contagion effect to the Nikkei 225. The Nikkei 225 will respond negatively to the shock from the JCI. Indonesia has no significant effect on Japan because Japan is a country whose index has the largest market capitalization value in Asia. In addition, Japan's exports and imports to Indonesia are not that big. Although Japan does not have the potential to be influenced by Indonesia in the short term, it still has the potential to be influenced by Indonesia in the long term because even though Japan's exports and imports to Indonesia are not large, export growth is very high.

For future expectations, NIKKEI 225 is dominantly influenced by itself and then STI so that to determine investment decisions, especially investment in Japan, one must pay attention to the condition of the Japanese economy itself and then the economic conditions of STI which have an effect in the short term and then those that have the potential to have an influence in the long term, namely China, Indonesia, and Malaysia lastly. NIKKEI 225 is dominantly influenced by STI in the short term then in the long term SSEC can also still have the potential to provide a contagion effect because China is also included in the list of countries that have the largest market capitalization index in Asia so that in the long term it can still have the potential to have an impact on NIKKEI 225. This is in accordance with the statement. According [10]. that a strong country's economy has a tendency to dominate the economy of a weaker country. In addition, Japan must increase exports to other countries. Increasing exports should be aimed more at Singapore, China, Indonesia and Malaysia, then reducing the amount of imports from China, Indonesia and Malaysia. This effort is made so that the Japanese economy remains strong so that it is not easily influenced by other countries. Japanese companies whose shares are listed on the Japanese stock exchange must increase the role of domestic investors to invest and not give share ownership rights only to the majority of shareholders. Japan also needs to pay more attention to Singapore's economic conditions because Singapore, even though it is a small country, is a developed country that can maximize the potential of the resources that exist in their country, then China because Japan is the target country for the largest export destination from China, so besides can provide benefits can also have a negative impact on Japan if one day Japan's economic conditions are shaken.

Effect of the NIKKEI 225 Index, STI, KLSE, and JCI on SSEC

Based on VECM estimates, Nikkei 225 in the short term has the potential to contagion effect to SSEC. Japan can have a significant influence on Shanghai because Japan is the largest export and import destination country for Shanghai, but its growth rate is still relatively stable so that Shanghai can still control it, besides that there are still other factors that can influence the movement of the Shanghai index. Even though Shanghai has the potential to be influenced by Japan in the short term, in the long term it is still

not certain that it can be potentially influenced by Japan.

Based on VECM estimates, STI in the short and long term has no potential contagion effect on SSEC. However, SSEC will respond negatively to shocks from STI. Singapore does not have a significant influence on Shanghai because Shanghai is a country that has the largest market capitalization index in the world, especially countries from the Asian region or in other words, the value of Shanghai's market capitalization is greater than that of Singapore so that Singapore has very little potential to be able to influence Shanghai. Apart from that, Shanghai's exports and imports to Singapore are not that high.

Based on VECM estimates, KLSE in the short and long term has no potential contagion effect to SSEC. However, SSEC responded negatively to the shock from KLSE. Malaysia does not have a significant effect because Shanghai is a country that has the largest market capitalization index in the world, especially countries from the Asian region or in other words, the value of Shanghai's market capitalization is greater than that of Malaysia, so Malaysia has little potential to influence Shanghai. In addition, Shanghai's import-export to Malaysia is not that high.

Based on the VECM estimation, the JCI in the short term has no potential contagion effect to SSEC. However, SSEC responded negatively to the JCI shock. Indonesia does not have a significant influence on Shanghai because Shanghai is a country that has the largest market capitalization index in the world, especially countries from the Asian region or in other words, the value of Shanghai's market capitalization is greater than that of Indonesia, so Indonesia has very little potential to influence Shanghai. In addition, Shanghai's exports and imports to Indonesia are not that high.

For future expectations, SSEC is dominantly influenced by itself and then the Nikkei 225 so that in making investment decisions, especially in Shanghai, one must pay attention to China's own economic conditions and then Japan's economic conditions. Shanghai is dominantly influenced by the Nikkei 225 because Japan has the largest market capitalization index in Asia so that in the long run it has the potential to influence SSEC. This is in accordance with Albert O. Hirschman's theory that capital markets in developed countries are able to influence developing countries. The strong country economies have a tendency to dominate the economies of weaker countries. In addition, China should increase exports to other countries. The increase in exports should be aimed more at Japan, Singapore, Malaysia and Indonesia. China should also be able to reduce the amount of imports to Japan, Singapore, Malaysia and Indonesia. China also needs to pay more attention to the condition of the Japanese economy because Japan is China's largest export destination country, so that apart from providing benefits it will also have the potential to have a negative impact on China if one day Japan's economic conditions are shaken.

Effect of the NIKKEI 225 Index, SSEC, KLSE, and JCI on STI

Based on VECM estimates, Nikkei 225 in the short term has no potential contagion effect to STI. However, STI will respond negatively to the shock from the Nikkei 225. Japan has no significant effect on Singapore because Japan is not Singapore's largest export-import destination country, so if a shock occurs to the Japanese index it will not directly affect Singapore's economy. Although Singapore does not have the potential to be influenced by Japan in the short term, it still has the potential to be influenced by Japan in the long term, so that Singapore should continue to maintain good relations with Japan and pay attention to Japan's economic conditions.

Based on the VECM estimation, SSEC does not have a significant effect on STI. Because Singapore itself is a developed country that can optimize all economic sectors in the country. So even though Shanghai is a country whose index has the largest market capitalization value in the Asian Region. Singapore can still avoid the contagion effect in the short term from Shanghai. But it is better if Singapore continues to maintain good relations with Shanghai both in terms of political relations and trade (export) relations. A high increase in exports should be aimed at countries that do not influence or countries that are unlikely to influence Singapore. In addition, Singapore must also pay attention to the economic condition of Shanghai because it is undeniable that Shanghai is a country that has the largest market capitalization index in the world, especially countries from the Asian region or in other words, the value of Shanghai's market capitalization is greater than that of Singapore.

Based on the VECM estimation, it shows that KLSE does not have the potential to infect STI in the short term but in the long term. STI will

respond positively to the shock from KLSE. Malaysia has the potential to contagion effect on Singapore because Malaysia is the largest import-export destination for Singapore. Even though Singapore is not influenced by Malaysia, Singapore should continue to maintain good relations with Malaysia both in terms of political relations and trade relations. Singapore must also improve trade relations, namely exports. A high increase in exports should be aimed at countries that do not influence or countries that are unlikely to influence Singapore. Apart from that, Singapore still has to pay attention to Malaysia's economic condition due to Malaysia's geographical location which is close to Singapore so that there is still the possibility of a contagion effect from Malaysia in the long term.

Based on the VECM estimation, it shows that the JCI has no potential contagion effect on STI and STI will respond negatively to shocks from the JCI. Indonesia does not have a significant effect on Singapore, this is because Indonesia is not Singapore's largest export-import destination country, so if there is a shock to the Indonesian capital market index, this will not directly affect Singapore's economy and Indonesia will not have a contagion effect on Singapore. Although Singapore does not have the potential to be influenced by Indonesia in the short term, it still has the potential to be influenced by Indonesia in the long term, so Singapore should continue to maintain good relations with Indonesia and pay attention to Indonesia's economic conditions.

For future expectations, STI still has to consider the contagion effect that might occur from the Nikkei 225 or SSEC because these two indices are included in the ranks of the largest capitalization values in the world, especially countries in the Asian region, so to make investment decisions, especially in Singapore, should pay attention to the economic conditions of Japan, then Shanghai China, Malaysia and finally Indonesia. The Singapore capital market index is most dominantly influenced by the Nikkei 225 index because among the four countries, Japan is the country whose capital market index has the largest market capitalization value in Asia so this index still has the potential to contagion effect on Singapore.

Effect of the NIKKEI 225 Index, SSEC, STI, and IHSG on KLSE

Based on the VECM estimation results, it shows that the Nikkei 225 in the short term has no potential contagion effect to KLSE. However, KLSE will respond positively to the shock from the Nikkei 225. Japan has no significant effect on Malaysia because Japan is not a country that contributes the largest foreign currency (not the largest export destination country). Because Malaysia's trade relations with Japan are not very close, the potential for transmission is also getting smaller. Although Malaysia does not have the potential to be influenced by Japan in the short term, it still has the potential to be influenced by Japan in the long term, so Malaysia should continue to maintain good relations with Japan and pay attention to Japan's economic conditions.

Based on the VECM estimation, SSEC in the short term has no potential contagion effect to KLSE. However, KLSE responded positively to the shock from SSEC. Shanghai has no significant effect on Malaysia even though China is one of Malaysia's biggest export destinations. Shanghai in the short term has no potential to infect Malaysia because there are still other factors that could affect Malaysia. Apart from Malaysia, it is an exporter of commodities that are needed by almost all countries even though the country is experiencing a crisis. So that the Malaysian economy is not easily affected in the short term so as to stabilize the Malaysian capital market. Although Malaysia does not have the potential to be influenced by Shanghai in the short term, it still has the potential to be influenced by Shanghai in the long term, so Malaysia should maintain good relations with Shanghai and pay attention to Shanghai's economic conditions. Shanghai has no potential contagion effect to Malaysia.

Based on the VECM estimation, STI in the short term has no potential contagion effect to KLSE. However, KLSE will respond negatively to the shock from STI. Singapore has no significant influence on Malaysia even though Singapore is one of the biggest export destinations for Malaysia. Singapore in the short term has no potential to infect Malaysia because there are still other factors that can affect Malaysia more. In addition, Malaysia is an exporter of commodities that are needed by almost all countries even though these countries are experiencing a crisis. So that the Malaysian economy will not be easily affected by outside influences in the short term. Although Malaysia does not have the potential to be influenced by Singapore in the short term, it still has the potential to be influenced by Singapore in the long term, so Malaysia should maintain good

relations with Singapore and pay attention to Singapore's economic condition.

Based on the VECM estimation, it shows that the JCI in the short term has no potential contagion effect to KLSE, but KLSE responds negatively to the shock from the JCI. Indonesia has no significant influence on Malaysia because Indonesia is not Malaysia's biggest export destination. Because Malaysia's trade relations with Indonesia are not very close, the potential for transmission is also getting smaller. Although Malaysia does not have the potential to be influenced by Indonesia in the short term, it still has the potential to be influenced by Indonesia in the long term.

For future expectations, KLSE is dominantly influenced by itself so to make decisions in investing, especially in Malaysia, it is better to pay more attention to the economic conditions of Malaysia itself and then what must be paid more attention to is the economic conditions of Japan, then Singapore, fourth in Shanghai China and finally Indonesia. Because from Japan, Shanghai, Singapore, and Indonesia. Japan is a country that has the largest market capitalization value in Asia so that this index still has the possibility of being able to influence the KLSE index, whose market capitalization value is lower than that of the Nikkei 225. This is in accordance with the theory of Albert O. Hirschman, namely the capital market, the country's capital market. developed countries can influence developing countries. Because a country that has strong capital must excel in every economic transaction. In addition, Malaysia must pay attention to the economic conditions of other countries, especially countries that have the greatest potential to affect Malaysia and countries that have the largest trade relations and the closest geographical location so that they can anticipate the effects of contagion. Malaysia must also improve its trade relations with other countries, especially exports.

Effect of the NIKKEI 225, SSEC, STI and KLSE Index on the JCI

Based on the VECM estimation, the Nikkei 225 does not have a potential contagion effect on the JCI in the short term, but not in the long term. Japan can still potentially infect Indonesia because apart from its fairly close trade relations, a number of Japanese investments and Japanese projects in Indonesia can be said to be very large. Because Indonesia still has relations and cooperation with Japan, Indonesia should maintain good relations with Japan both in terms of political relations and trade (export) relations. A high increase in exports should be aimed at countries that do not influence or countries that are unlikely to influence Indonesia. Apart from that, Indonesia also has to pay more attention to Japan's economic conditions because the closer relations between Indonesia and Japan, apart from bringing big profits, will also have big risks. Nikkei 225 does not affect the JCI supported by According [11], that Nikkei has no significant effect on the JCI.

Based on VECM estimates, SSEC has the potential not to transmit the contagion effect to the JCI in the short term but there is still a possibility of transmission in the long term because Shanghai has quite close trade relations with Indonesia, and Shanghai investment and the number of Shanghai projects in Indonesia can be said to be in large numbers. So that in the long run SSEC can still affect the JCI because SSEC partially has a significant effect on the JCI.

Based on the VECM estimation, it shows that STI has no potential contagion effect on the JCI, and the JCI responds negatively to shocks from STI. Singapore does not have a significant influence on Indonesia because its trade relations are not very close, besides that the growth rate of investment and investment in Singapore is not as big as Japan and Shanghai is not that big. So if in the short term Singapore will not have much influence on Indonesia, but in the long term there is still the potential for Singapore to influence Indonesia. Therefore, Indonesia should continue to maintain good relations with Singapore and pay attention to Singapore's economic conditions. Indonesia must also ensure that Singapore's investment in Indonesia does not experience a very large increase or decrease because it will make the Indonesian economy vulnerable to being affected by international issues. This result is the same as According [12], that Singapore does not affect Indonesia.

Based on the VECM estimation, it shows that KLSE has no potential contagion effect on the JCI both in the short and long term, however, the JCI responds positively to the shock from KLSE. Malaysia does not have a significant influence on Indonesia because its trade relations with Indonesia are not very close, apart from that Malaysia's investment in Indonesia in 2012 was not large. This is supported by According [13], that the Malaysian index does not affect the Indonesian index.

For future expectations, the JCI still has to be careful with the Nikkei 225 because Japan and China are countries whose indexes have the largest market capitalization values in Asia, so this index still has the possibility to provide a contagion effect on the JCI index, which has a lower market capitalization value compared to Nikkei 225. In addition, Japan is the largest export destination country in Asia for Indonesia, Japanese investment in Indonesia is also very large and the number of Japanese projects in Indonesia is also large, and the growth of Japanese investment in Indonesia is very high, so that Japan can be said to be a country that is quite influential for increase or decrease in Indonesia's foreign exchange reserves. Therefore, Indonesia must maintain good relations with Japan and Shanghai both in terms of political relations and trade (export) relations. A high increase in exports should be aimed at countries that do not influence or countries that are unlikely to influence Indonesia. Apart from that, Indonesia also has to pay more attention to the economic conditions of Japan and China because Japan and Shanghai are countries that also have large trade relations so that this situation might bring big profits but there will also be big risks too, of course. Domestic investors should also be encouraged to further increase their role in investing in the Indonesian Stock Exchange.

CONCLUSION

Based on the discussion from the chapter above, this research can be drawn the following conclusions:

1. All Asian stock indices in the short term have no potential to infect the Japanese index, except for SSEC because the Japanese index has the largest capitalization value in Asia so it is possible that an index that can influence the Japanese index is an index with a large capitalization value as well, namely the China Shanghai Index with a capitalization value largest after Japan. However, in the long term, only SSEC, STI and JCI have the potential to infect the Nikkei 225, while KLSE has no potential to infect (contagion effect) to Japan.
2. All Asian stock indices in the short term have no potential to infect Shanghai except for the Japanese index, namely the NIKKEI 225 because the NIKKEI 225 index is one of those with the largest market capitalization value in the world, followed by the Shanghai index having the largest capitalization value in the Asian region after Japan. However, in the long run, only Japanese and Indonesian indices have the potential to infect Shanghai, while Singapore and Malaysia do not have the potential to infect (contagion effect) to Shanghai.
3. There is no potential contagion effect in the short term to the Singapore capital market. But in the long run the potential for transmission comes from Malaysia and Shanghai which might affect Singapore because of Singapore's trade relations with Malaysia plus the geographical location between these countries which are close to each other, then Shanghai which is on the list of countries with the largest market capitalization value in the world, especially countries that originating from Asia, so there is still a potential contagion effect on Singapore. In the long term, only Japan, Shanghai and Indonesia have the potential to infect Singapore.
4. In the short term, all Asian stock indices have no potential to spread to Malaysia because Malaysia is an exporter of commodities that all countries need despite the crisis. However, in the long term, all of these Asian stock indices have the potential to contagion to the Malaysia Index.
5. There is no potential for transmission in the short term to the Indonesian capital market. However, in the long term, there may be a potential for transmission from Japan and Shanghai because Indonesia's trade relations with Japan and Shanghai are very large. In addition, the investment and number of Japanese and Shanghai projects in Indonesia are very large, so the potential contagion effect is quite high. In the long term, only Japan, Shanghai and Singapore have the potential to infect Indonesia, while Malaysia does not have a contagion effect on the Indonesian capital market.
6. The dominant Asian stock indices influence other indices, namely the Nikkei 225 from Japan and also the SSEC from Shanghai China because these Japanese and Chinese indices are included in the list of indices with the largest market capitalization value in the Asian region so that they have the potential to provide a contagion effect to Asian capital markets which other.

SUGGESTION

Based on the conclusions above, this study proposes the following suggestions:

1. Investors need to pay attention to the condition of the company whose shares will be purchased and consider the economic conditions of the country where the investor invests.
2. Investors must also have information related to changes in share prices so that they can make the right decisions in choosing company shares in a country that will be used as a place to invest.
3. Investors should not be influenced by the behavior of other investors in making decisions to withdraw or invest their capital.
4. Asian countries should pay more attention to Japan's economic conditions because Japan has a high potential to have a contagion effect.
5. Domestic investors must be encouraged to increase their role as investors in order to balance the role of foreign investors so that the domestic capital market is not vulnerable to external shocks.

ACKNOWLEDGEMENT

The writing of this scientific work was carried out in order to fulfill one of the requirements to obtain a Bachelor of Economics degree at the Faculty of Economics, Brawijaya University, Malang City. I am grateful for the guidance from various parties in completing this scientific thesis. Therefore, I would like to thank Mr. Nurkholis, Ph.D as the Dean of the Faculty of Economics and Business, Brawijaya University Malang, Mr. Dr. rer.pol Wildan Syafitri as Chair of the Department of Economics, Prof. Dr. Moh. Khusaini, S.E., M.Sc., M.A as the supervisor who has provided guidance, direction, support and input to the author. Mrs. Yenny Kornitasari, S.E., M.E as a lecturer reviewing the proposal seminar. Finally, I thank you and hope that this scientific writing can be useful for all parties who need it.

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