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Integration of Stock Markets Between Indonesia and Its Major Trading Partners

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Abstract: The aim of this study is to analyse the integration between the emerging stock market of Indonesia and its major trading partners The Research methodology using VECM (Vector Error Correction Model) frameworks, (i.e., US, China, Japan, and Singapore) during the period of January 2016 to December 2018 with monthly data of the Indonesian stock market. The result of is this research found that the Indonesia stock market affected by its major trading partner in short term and long term. Indonesian market (JCI) responds to US market (DJIA) in positive (+) both in short run and long run. Meanwhile, Indonesian market (JCI) responds to Japan market (N225) in negative (-) only in the long run and not significant in the short run. However, China (SCI) and Singapore market (STI) are not significant in short run and long run. This research gap is to explain how the implications of the dynamics of one country's capital market affect the development of stock indexes in other countries. The benefits of this study are to explain the interaction between the dynamics of one capital market in a country and the capital markets of other countries so that appropriate macroeconomic policies can be formulated to anticipate economic effects that have the potential to cause uncertainty in the capital market. The implications of this study provide an overview of the relationship between the development of stock indexes in one country and another.
Keywords: Jakarta Composite Index; Major Trading Partners; Market Integration; Market Segmentation
JEL Classification: G15; C32; F36; F44

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Introduction

World has changed rapidly as we are living in globalization era. Globalization helps everything done in fingertip and bring positivity to all sector as well as economy. In the modern era of economy, often hear free-trade market. Free-trade market boosted as globalization in economy occurred. Today, trade is not what we known as it was as we know the existence of capital market. In capital market everybody has its own right to choose freely wherever and whenever to enter the market. Samsul (2006) states that capital market is a place or medium where demand and supply of long-term financial instruments meets.

Before investing in capital market, investors should understand and consider the factors that can influence the investment price movements. According to Kwon, et al (1997), Malhotra (2024), Putra and Setiawan (2024) these factors include: (1) a microeconomic that tends to be

controlled, (2) a macroeconomic such as movements in exchange rates and stock indices on the US market cannot be ignored as the impact of globalization on capital markets where factor is out of control by listed companies or by the exchange itself. (Robiyanto, 2018)

Indonesia Stock Exchange (IDX) as the official authority uses *Indeks Harga Saham Gabungan* (*IHSG*) or known as Jakarta Composite Index (JCI) in english (named prior era of disunited between Jakarta and Surabaya stock exchange) as a measurable metric for all stock movement by listed companies. Therefore, investors are able to understand the condition of all listed company as holistic. Remember, any changes either upside or downside, it doesn't always mean all listed stock goes as well, only some particular stocks might be, due to different market capitalization value of companies contribute to pooled market capitalization of stock exchange and JCI measures all gather listed company in calculation. The development of the composite stock index indicates changes in both aspects of government policy in the financial and trade sectors and is also a response to external changes in global stock market conditions (Nyakurukwa & Seetharam, 2023).

Nowadays, the development of capital market has greater than ever. This may lead into an integration among capital market around the world from developed countries to developing countries. Moreover, a capital market can be influenced by another while influencing another. Capital market has integration connection where the risks and return not only considered by domestic factor, also determined by movement of capital market globally. The development of the capital market indicates the increasing volume and value of economic transactions occurring in a country, although it cannot be denied that there is a bubble economy due to the speculative behavior of some capital market players (Pareek, 2023). In addition, if two separated market had similar movement and correlation of indices respectively it also counted as well (Click & Plummer, 2003).

Figure 1 Indices Movement of DJIA, SCI, N225, STI, and JCI
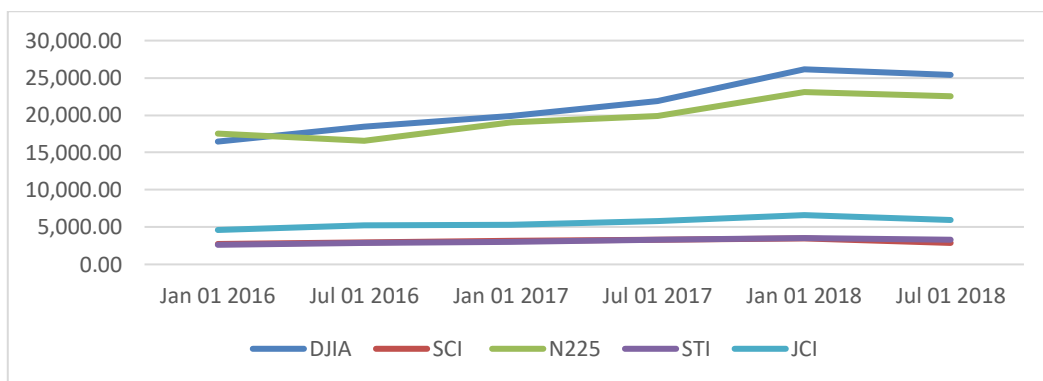Source: Yahoo Finance

Figure 1 shows Dow Jones Industrial Average (DJIA), Shanghai Composite Index (SCI), Nikkei 225 (N225), Straits Times Index (STI), and Jakarta Composite Index (JCI) from 2016 until 2018. Starts from 2016, DJIA went sky-rocketing and continue in January 2017 then its peak reached in January 2018, right before slightly down July 2018. Next, N225 also

went high and continue in 2017 goes fluctuating down little bit prior get higher level then reached its peak in January 2018, right before down in July 2018. The development of the Jakarta Composite Index (JCI) indicates that the development of the Indonesian economy is very sensitive to domestic and global economic developments such as the policy of the US central bank, namely The Fed, in raising interest rates. Likewise, the response to the domestic economy also affects the fluctuation of the JCI, for example the government's policy of raising taxes on several types of commodities in the trade sector (Behera et al., 2023).

Unfortunately, the good condition was not followed by other variables which are SCI and STI. Seen from 2016 until 2018, there were no significant movement as fair to be said sideways even a little drop shown on the July 2018, trends for both are sideways. For JCI, were not significant increasing compared to DJIA and N225 slight increasing little bit over years eventually reached its peak at January 2018 and getting down at July 2018 so for major trend was sideways (Nguyen & Elisabeta, 2016)

US commonly uses Dow Jones Industrial Average (DJIA) consist of top large market capitalization 30 companies as a one of metric in order to assess performance in capital market. In knowing the average capital market's movements, Shanghai Composite Index (SCI) regularly use in China due to popularity rather than Shenzhen Composite Index (SZCOMP). While NIKKEI 225 (N225) more popular in Tokyo Stock Exchange (TSE) and most respected in assessing performance rather than Tokyo Price Index (TOPIX) and J30 Index. Singapore uses Straits Times Index (STI) in order to assess performance of stock market. Indonesia Stock Exchange (IDX) as legal authority uses Jakarta Composite Index (JCI) as a mirror of all trade activity rather than LQ45 or JII. The phenomenon of pattern as shown in Figure 1. means how one market responds to another, as market goes hassle-free the movement becomes more cohesive. This phenomenon contributes to other research related to factors that influence stock value fluctuations against other macroeconomic indicators. (Thao & Daly, 2012)

Theoretical Framework

Efficient market is where all stock prices reflect all information availability. Under these conditions, investors do not earn profit as all investors equally well-informed. The capital market is called to be efficient if all information that reflects the price of the stock will make investors only expect normal returns. Information that has been obtained by investors in early period has no means as price automatically change (Malkiel & Fama, 1970). In prior research conducted by Pinem (2019) with multiple regression and data were taken January 2014-2015, she found that FTSE, Exchange Rate of USD/IDR, Dow Jones Industrial Average (DJIA), STI (Straits Times Index), KOSPI Composite Index (KS 11), Hang Seng, inflation positive relation to CSPI. However, the interest rate does not affect the CSPI. Plenty beneficial points are earned with integration market. Belke and Keil (2016) states that some of benefit obtained by integrated market seen from the point of view of a country, it can be a lower global risk, positive impact from foreign capital flows to investment and domestic growth, improve macroeconomic policies and efficiency with the stability of domestic financial policy. Furthermore, financial market integration will

encourage specialization in production, improving the level of efficiency in the financial industry and directing better economic policy (Babecky et al., 2017). Eichengreen et al. (1996) states that contagion effect can be occurred due to the interdependence of the similarity of the market economy such as macroeconomic, trade and loans from banks. The second cause is more forces on investor behavior, the type of contagion is came from asymmetrical information, mutual behavior and loss of confidence regardless a concerned of a country macroeconomic performance. Because of capital market participants received the same information, so a few new information can be spread throughout the world and gives the signal that triggers the same change reaction. Bae (1995) states that when a market has equal risk characteristics with identical price in regarded as integrated even separated. Hence, risk and reward determine not only domestic factors furthermore, global factors are applied. An integrated market gives significant benefit as no boundaries in capital inflow. Capital market integration means the distribution of the stock market between developing and advanced countries has a close relationship because of economic activity. According to Ehigiamusoe and Lean (2018) states there are three important things to define financial integration. First, integration is not depends on the financial structure in a particular region. Structure finance covers all intermediaries, institutions and financial markets and how they relate to one another with respect to second flow of funds from individuals, governments and companies in a particular the region. Commonly, each region develops a structure financially different before they are financially integrated, there is no guarantee that financial integration will lead to integrated financial structures in any region. Bodie et al, (2008) states that factor models are tools to explain and measure different factors that can influence the yield of a security over a certain period. The single factor model is explained in the following equation:

$$r_i = E(r_i) + \beta_i F + e_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (1)$$

$E(r_i)$ stands for expected return from an asset called *i*. If macro factors declared to be zero (no major economic turmoil) at certain period, hence actual return an asset will exactly same as expected return (Bodie et al., 2008).

In the multiple factor model, we assume two important economic sources such as GDP growth and changes in interest rates. Any decrease in interest rates, which should be good news for shares, is called *IR*. The yield of stock will respond to the influence of factors in model. Therefore, the two-factor model that explains the level of stock returns *i* in the same period as follows (Bodie et al., 2008):

$$r_i = E(r_i) + \beta_i GDP + \beta_i IR + IR + e_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (2)$$

Two factors on the right side of the equation for systematic factors in the economy. The coefficient of each sector in equation (2) measures the sensitivity of the actual yields on the factor. Coefficients also often referred to as factor sensitivity, factor loading, or beta factor and ei reflects the influence of company-specific factors (Bodie et al., 2008). Preis et al. (2012) states formula of determining index as follows:

DJIA = $\dfrac{\sum \mathrm{P}i\,(t)}{\text{Divisor}}$

∑ P stands for price of DJIA element *i* at day *t* in units of USD. Divisor updated in order to anticipates index jumps caused by effects of stock splits, bonus issues, dividends payouts or replacements of individual index components keeping the index value real. This calculation works if and only if assets are regarded equal value.

Research Method

The research methodology of this study uses a Vector Autoregressive (VAR) / Vector Error Correction Model (VECM) analysis. The steps of the VAR/VECM analysis are stationarity test, optimum lag determination, causality test, cointegration test, VAR stability test, VAR / VECM estimation, Impulse Response Function (IRF), and Variance Decomposition (VD). VAR is an econometric model that is used to capture the dynamics and interactions between several time series. Data sources were obtained from Bank Indonesia and Indonesian capital market authorities such as OJK, Bapepam. VAR itself was developed in response to the argument of Sims (1992) that there is no a priori guide or large economic reasoning to justify the treatment of certain variables as exogenous variables in the modelling process and therefore all variables must be treated as endogenous. There are at least four reasons to be obtained using the VAR method, namely data description, forecasting, inference structural and policy analysis. VAR analysis can be used for:

1. Granger Causality Test, which is to know the causal relationship between variables.
2. Forecasting, namely by extrapolating the current and future values of all variables through the utilization of all the past information of the variable.
3. Impulse Response Function (IRF), namely by detecting the response of each variable both now and in the future due to changes or shock of a particular variable.
4. Forecast Error Decomposition of Variance (FEDV), which is by predicting the contribution of the percentage of variance of each variable to changes in a particular variable (Gujarati, 2003).

Result and Discussion

Time series data are generally stochastic. If the data has a unit root then the data is said to be not stationary. Unit root testing is one of the concepts that has become increasingly popular lately for the purpose of time series data. (Gujarati, 2003) This test was developed by Dickey and Fuller, using (Augmented Dickey Fuller) using a 5% significance level. The ADF stationary test of each variable is shown in the Table 1.

Table 1 Result of ADF Test at Level

Variable	ADF t- Statistics	Mc Kinnon Critical Value 5 Percent	Prob	Information
DJIA	-1.64626	-2.948404	0.449	Non-stationary
SCI	-0.78882	-2.948404	0.8099	Non-stationary
N225	-1.29906	-2.948404	0.619	Non-stationary
STI	-1.97564	-2.948404	0.2957	Non-stationary
JCI	-1.78084	-2.948404	0.3835	Non-stationary

Stationary stochastic test is the first step of VAR/VECM model which aim to determine data whether stationary or non-stationary. Gujarati states that if the regression equation using non-stationary variables, it will produce spurious regression. ADF (Augmented Dickey Fuller) test is determine whether data in stationary or non-stationary. (Gujarati, 2003) The ADF test results for the first difference standard are shown in Table 2.

Table 2 Result of ADF Test at First Difference

Variable	ADF t-Statistics	Mc Kinnon Critical Value 5 Percent	Prob	Information
DJIA	-4.863431	-2.951125	0.0004	Stationary
SCI	-7.140477	-2.951125	0.0000	Stationary
N225	-6.741458	-2.951125	0.0000	Stationary
STI	-7.457452	-2.951125	0.0000	Stationary
JCI	-4.676036	-2.951125	0.0006	Stationary

Source: Appendix 3

From Table 2, it can be seen that all of the variables surpass stationary test at the first difference standard. Cointegration test aims to determine the long-term relationship of respective variable, as VECM estimation requires cointegration relationship among variables. If there is no cointegration relationship found in model, then VECM estimation cannot be completely done, otherwise using VAR (Vector Autoregression) model as alternative. This study uses Johansen's Cointegration Test in Eviews 7 with a critical value of 0.05 in order to determine cointegration in model. Cointegration test results are shown in Table 3.

Table 3 Johansen's Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace-Statistic	0.05 Critical Value	Prob.**
None *	0.679412	91.64687	69.81889	0.0004
At most 1 *	0.509750	52.96853	47.85613	0.0153
At most 2	0.324998	28.73199	29.79707	0.0660
At most 3	0.229850	15.36863	15.49471	0.0522
At most 4 *	0.173742	6.488852	3.841466	0.0109

Trace test indicates 2 cointegrating eqn(s) at the 0,05 level
*denotes rejection of the hypothesis at the 0,05 level
**Mackinnon-Haug-Michelis (1999) p-values
Source: Appendix 5

One of approach that can be used in cointegration test is by the Johansen method. This method compares the two different statistical tests, namely trace statistics and Max-Eigen

statistics. If the Max-Eigen value and trace value are greater than the critical value of 1% and 5%, then the data integrated. The VECM estimation results can be shown in Table 4.

Table 4 Result of VECM - Short Run

Variable	Coefficient	t-Statistic Parsial
CointEq1	-0.013488	[-0.50769]
D(JCI(-1))	0.053466	[0.26489]
D(DJIA(-1))	0.164346	[2.22397]
D(SCI(-1))	-0.357579	[-1.13152]
D(N225(-1))	-0.077775	[-1.63279]
D(STI(-1))	0.039205	[0.11570]

From Table 4 can be explained short-term estimation results show that the JCI variable in lag 1 is not significant effect on the JCI, which is t-stat score 0.26489 is lower than 1.96, means H_0 is accepted and H_1 is rejected or in other words means any movements from prior month of JCI does not bother JCI today. DJIA variable in lag 1 has a positive and significant effect on the JCI, which is 0.164346. That means, if there is an increase in the DJIA by one point in the prior year, it will raise the JCI in the current year by 0.164 points. Result showed that, the partial t-statistic value of the DJIA variable at lag 1 is 2.22397 which greater than 1.96, which means, H_0 is rejected and H_1 is accepted or in other words, the DJIA variable significantly affected the JCI in the short term. (Palamalai & Devakumar, 2013). SCI in lag 1 on short-term estimation of VECM estimation has no effect and is not significant on JCI. Means, if there is either an increase or decrease in SCI in short term, it does not affect any changes of the JCI. The analysis shows that the partial t-statistic value of SCI variable in lag 1 is not significant effect on the JCI, which is t-stat score -1.13152 is greater than -1.96, means H_0 is accepted and H_1 is rejected or in other words means any movements from SCI in prior month does not bother JCI. Short-term estimation of VECM estimation shows that N225 in lag 1 has no effect and is not significant on JCI. Means, if there is either an increase or decrease in SCI in short term, it does not affect any changes of the JCI. The analysis shows that the partial t-statistic value of N225 variable in lag 1 is not significant effect on the JCI, which is t-stat score -1.63279 is greater than -1.96, means H_0 is accepted and H_1 is rejected or in other words means any movements from N225 in prior month does not bother JCI. Short-term estimation of STI in lag 1 has no effect and is not significant on JCI. Means, if there is either an increase or decrease in SCI in short term, it does not affect any changes of the JCI. The analysis shows that the partial t-statistic value of STI variable in lag 1 is not significant effect on the JCI, which is t-stat score 0.11570 is smaller than 1.96, means H_0 is accepted and H_1 is rejected or in other words means any movements from STI in prior month does not bother JCI.

Table 5 Result of VECM - Long Run

Variable	Coefficient	t-Statistic Parsial
D(DJIA(-1))	1.880452	[6.51864]
D(SCI(-1))	1.236302	[1.14416]
D(N225(-1))	-2.421245	[-7.09509]
D(STI(-1))	-1.908164	[-1.07405]

Source: Appendix 8

Table 5 explains that DJIA in lag 1 has a positive and significant towards JCI, which is 1.88. Means, if there is an increase in DJIA by one point in the prior year, it will increase the JCI in the current year by 1.88 points. The analysis shows that, the partial t-statistic value of DJIA variable at lag 1 is to 6.51864 or greater than 1.96 which means, H_0 is rejected and H_1 is accepted or in other words, the DJIA variable has a significant effect on the JCI in the long run. This hypothesis in accordance with previous studies conducted by Pinem (2019) and Robiyanto et al. (2019) which stated that Dow Jones Industrial Average (DJIA) has positive relation and significant towards Jakarta Composite Index (JCI). (Ross, 1976)

Long-term estimation of VECM estimation shows that SCI in lag 1 has no effect and is not significant on JCI. Means, if there is either an increase or decrease in SCI in previous year, it does not affect any changes of the JCI. The analysis shows that the partial t-statistic value of SCI at lag 1 is 1.14416 or less than 1.96 which means that H_0 is accepted and H_1 is rejected or in other words, SCI variable does not significantly influence the JCI in the long run. This result may contradict towards prior studies such as Santosa (2013) that stated Shanghai Composite Index (SCI) has positive relation towards Jakarta Composite Index (JCI) and Oktarina (2016) stated that SCI has negative impact towards JCI. (Singh et al., 2010)

VECM estimation shows that N225 in lag 1 has negative effect and significant on JCI, which is -2.42. Means, if there is an increase in N225 by one point in the prior year, it will decrease the JCI in the current year by 2.42 points. The analysis shows that the partial t-statistic value of N225 at lag 1 is -7.09509 or less than -1.96 which means that H_0 is rejected and H_1 is accepted or in other words, N225 variable significantly influence the JCI in the long run. However, this result comes in different than prior study conducted by Altin and Sahin (2010) and Kusumawati and Asandimitra (2017) stated that N225 positively related and significant to JCI. Estimation of VECM estimation shows that variable STI in lag 1 has no effect and is not significant on JCI. Means, if there is either an increase or decrease in SCI in previous year, it does not affect any changes of the JCI. The analysis shows that the partial t-statistic value of STI at lag 1 is -1.07405 or greater than 1.96 which means that H_0 is accepted and H_1 is rejected or in other words, STI variable does not significantly influence the JCI in the long run. Pinem (2019) states STI has positive relation towards JCI. (Karim et al., 2009). Overall, in short term only DJIA is positive relation and significant while others' dont. While in long term, DJIA and N225 are significant though different relation towards JCI. SCI and STI stay the same result for either short term or long term. (Choi & Rajan, 1997). Impulse Response Function (IRF) describes the expected period in the future from the prediction error of an effect variable innovation from other variables. Thus, for ever the influence of the shock of another variable to its effect lost or returned to the point of balance can be seen or is known, IRF analysis is used to explain the impact of shocks that occur in one variable on other variables, not only short term also long term. (Sims, 1992, Ajija et al., 2011). In short, IRF analysis helps to see a long-term response of model, if the variable experiences a shock from independent variables toward dependent variables. Another function of Impulse Responses Function is to see how long the influence lasts given from every variable to another. The data used in this study are monthly data taken from January 2016 to December 2018. A fairly long period is expected to describe the response of the

dependent variable to the independent variable. In this study, the IRF analysis is used to show the JCI response to its shock. The results of the IRF analysis are as follows:
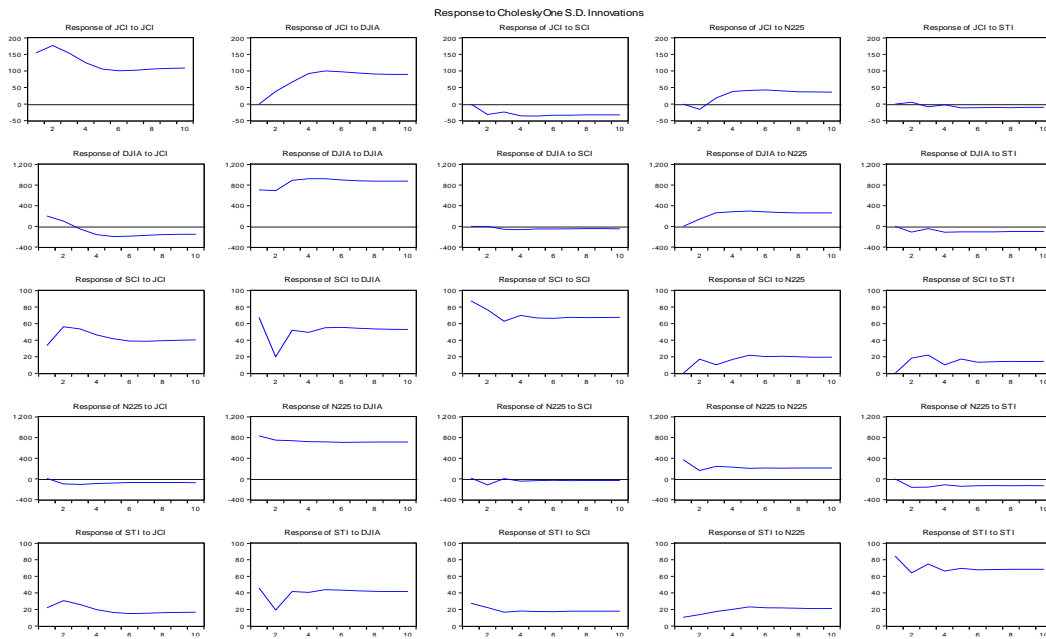

Figure 1 Impulse Response Function (IRF)

From Figure 1, it can be explained that the JCI response to shock given by DJIA is positive (+), from the first period to the fourth period, it increased. Then starts from fourth to the tenth period JCI experienced a stagnation. Based on the explanation above, it can be concluded that the positive response (+) of the JCI to the shock of the DJIA lasted throughout the period from the first period to the tenth periods the JCI response to shock given by SCI is negative (-), from the first period to the second period, it drowns. Then starts from third a little side up even still below horizontal line eighth period to the tenth period JCI experienced a stagnation under horizontal line. Based on the explanation above, it can be concluded that the negative response (-) of the JCI to the shock of the SCI lasted throughout the period the JCI response to shock given by N225 is positive (+), starts from the first period to the second period, it drowns. Then starts from third it spikes over horizontal line until reach fourth. From fifth period until tenth JCI experienced a stagnation. Based on the explanation above, it can be concluded that the positive response (+) of the JCI to the shock of the N225 lasted throughout the period from the first to the tenth periods the JCI response to shock given by STI is negative (-), starts from the first period to the second period, it holds over horizontal line. Then starts from third period it drowns horizontal lines, even almost reach horizontal at fourth period but it goes lower and remains below horizontal line throughout tenth period. Based on the explanation above, it can be concluded that the negative response (-) of the JCI to the shock of the STI lasted throughout the period from the first to the tenth periods (Hooper et al., 2000). Furthermore, Ajija et al. (2011) states that variance decomposition is a device in the model VAR which will separate variations from a number of variables estimated to be shock components or become innovation variable, assuming that the variables

innovation does not correlate with each other. In short, VDC analysis (Variance Decomposition) aims to measure the size of the composition or contribution of the influence of independent variables (DJIA, SCI, N225, and STI) on the dependent variable. The data used in this study are time series data formed in monthly data taken from 2016 to 2018. This period is considered sufficient to explain the contribution of the DJIA, SCI, N225 and STI variables to the JCI. The VDC analysis can be shown in Table 6.

Table 6 VDC Result of JCI

Variance Decomposition of JCI:					
Period	S.E	D(JCI)	D(DJIA)	D(SCI)	D(N225)	D(STI)
1	154.6071	100.0000	0.000000	0.000000	0.000000	0.000000
2	240.7004	95.25749	2.499636	1.739011	0.451863	0.520000
3	295.0294	90.63574	6.733993	1.811695	0.702201	0.116368
4	337.5055	82.95922	12.62634	2.514058	1.808031	0.092352
5	371.9080	76.42233	17.65983	3.026539	2.717787	0.173521
6	401.3402	71.90294	21.09104	3.313821	3.464520	0.227682
7	427.9700	68.93813	23.36142	3.539061	3.898210	0.263174
8	452.8993	66.98302	24.88831	3.685014	4.152362	0.291295
9	476.7308	65.57635	25.99510	3.793278	4.328040	0.307231
10	499.6395	64.44505	26.88893	3.883722	4.463439	0.318856

From Table 6, it can be explained that in the first period, the JCI was strongly influenced by the contribution of the JCI itself by 100 percent at beginning. Meanwhile, in the first period, the variables DJIA, SCI, N225 and STI did not have an effect on the JCI. The proportion goes smaller along period ahead for JCI especially decreasing aggressively at third to fourth period and reach its lowest point at 64.44505. Overall, at tenth period, JCI holds largest piece of cake. Furthermore, in the second period the DJIA variable starts contribute 2.499636 percent, and increase aggressively at third to fourth period. The percentage goes larger until the tenth period, which was peaked at 26.88893 percent. Compared to other independent variables, DJIA gave the dominance share of composition toward JCI, which was the highest portion that occurred in the tenth period, which was 26.88893 percent. SCI comes in third place compared to other variables, starts from 1.739011 at second period and goes along the way until tenth period which also remarked as peak with 3.883722 percent. The biggest leap occur in first to second period amounted 0.000000 to 1.739011 percent. In the second period the N225 variable gave a contribution of 0.451863 percent which experienced a significant increase in the fifth period to six period starts from 2.717787 to 3.464520. N225 contribution peaked at tenth period 4.46343. All in all, N225 contributes second proportion of contribution. Last place is for STI, there is slight improvement from first period until tenth period. STI variable gave a shock of 0.052000 percent at second period. Light increasing until third place and bit down at fourth period at 0.092352 then increasing until tenth period. The peaked share contribution at 0.318856. (Heaney & Hooper, 2001).

Conclusion

The conclusions of this research are follows Dow Jones Industrial Average (DJIA) is significant and gives positive effect (+) on the Jakarta Composite Index (JCI) in the short and long term. In addition, there is no causal relationship either between DJIA and JCI or DJIA and JCI. Shanghai Composite Index (SCI) is not significant and doesn't affect anything on the Jakarta Composite Index (JCI) in the short and long term. In addition, there is no causal relationship either between SCI and JCI or JCI and SCI. Nikkei 225 (N225) is significant and gives negative effect on the Jakarta Composite Index (JCI) in long term however it doesn't significant in short term also there is no causal relationship either between N225 and JCI or JCI and N225. Straits Times Index (STI) is not significant and doesn't affect anything on the Jakarta Composite Index (JCI) in the short and long term also there is no causal relationship either between STI and JCI or JCI and STI (Ghiffari et al., 2018). The suggestions of this research are follows that Policy makers are expected to be more conscious in making policies as the movement of Jakarta Composite Index (JCI) is not only influenced by internal factors, but is way beyond external factors like Dow Jones Industrial Average (DJIA) which gives a positive influence (+) and N225 which gives a negative influence (-). The government must strive to pursue a better economic growth, maintaining its country as capital market index reflect a country economic conditions. If economic growth much better than global average, it will attract global investors to come in. Investors are expected to maximize potential profits and minimizing potential loss by understanding the relation that occurs among markets like Dow Jones Industrial Average (DJIA) which gives a positive influence (+) and N225 which gives a negative influence (-). This information is practical in international diversification and decisions related to capital investment. Investors are expected to obtain optimum portfolio by understanding the relation that occurs among markets like Dow Jones Industrial Average (DJIA) which gives a positive influence (+) and N225 which gives a negative influence (-). This information is practical in international diversification and decisions related to capital investment.

References

Ajija, S. R., Sari, D. W., Setianto, R. H., & Primanti, M. R. (2011). *Cara cerdas menguasai Eviews*. Salemba Empat.

Altın, H., & Sahin, M. (2010). Global market integration around the world: The case of Europe, America, Asia/Pacific, and BRIC-T. *Middle Eastern Finance and Economics*, 8, 50-67.

Babecky, J., Komarek, L., & Komarkova, Z. (2017). Financial integration at times of crisis and recovery. In Economic Imbalances and Institutional Changes to the Euro and the European Union (pp. 173-190). https://doi.org/10.1108/S1569-376720170000018010

Bae, K. H. (1995). Market segmentation and time variation in the price of risk: Evidence on the Korean stock market. *Pacific-Basin Finance Journal*, 3(1), 1-29. https://doi.org/10.1016/0927-538X(94)00024-2

Behera, J., Pasayat, A. K., Behera, H., & Kumar, P. (2023). Prediction-based mean value at risk portfolio optimization using machine learning regression algorithms for

multinational stock market. *Engineering Applications of Artificial Intelligence*, 120, 105843. https://doi.org/10.1016/j.engappai.2023.105843

Belke, A., & Keil, J. (2016). Financial integration, global liquidity, and global macroeconomic linkages. *Journal of Economic Studies*, 43(1), 16-26. https://doi.org/10.1108/JES-02-2015-0026

Bodie, Z., Kane, A., & Marcus, A. J. (2008). *Essential of Investments* (International Edition). McGraw-Hill.

Choi, J. J., & Rajan, M. (1997). A joint test of market segmentation and exchange risk factor in international capital market. *Journal of International Business Studies*, 28(1), 29-49. https://doi.org/10.1057/palgrave.jibs.8490092

Click, R. W., & Plummer, M. G. (2005). Stock market integration in ASEAN after the Asian financial crisis. *Journal of Asian Economics*, 16(1), 5-28. https://doi.org/10.1016/j.asieco.2004.11.018

Ehigiamusoe, K. U., & Lean, H. H. (2019). Do economic and financial integration stimulate economic growth? A critical survey. *Economics: The Open-Access, Open-Assessment E-Journal*, 13, 1-27. https://doi.org/10.5018/economics-ejournal.ja.2019-4

Eichengreen, B., Rose, A. K., & Wyplosz, C. (1996). Contagious currency crises (No. w5681). *National Bureau of Economic Research*. https://doi.org/10.3386/w5681

Ghiffari, M. F., Kindangen, P., & Tumewu, F. (2018). The causality relationship of Dow Jones Industrial Average (DJIA) and Nikkei 225 towards Jakarta Composite Index (JCI) period 2011-2016. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi*, 6(1), 292-301.

Gujarati, D. (2003). *Basic Econometrics*. McGraw-Hill.

Heaney, R., & Hooper, V. (2001). Regionalism, political risk, and capital market segmentation in international asset pricing. *Journal of Economic Integration*, 16(3), 299-312. https://doi.org/10.11130/jei.2001.16.3.299

Hooper, V. J., Bilson, C., & Jaugietis, M. (2000). The impact of liberalization and regionalism upon capital markets in emerging Asian economies. *UNSW School of Banking and Finance Working Paper*. https://doi.org/10.2139/ssrn.285216

Karim, B. A., Majid, M. S. A., & Karim, S. A. A. (2009). Integration of stock markets between Indonesia and its major trading partners. *Gadjah Mada International Journal of Business*, 11(2), 229-252. https://doi.org/10.22146/gamaijb.5526

Kusumawati, D. A., & Asandimitra, N. (2017). Impact of global index, gold price, and macroeconomic variable on the Indonesia Composite Index. *Research Journal of Finance and Accounting*, 8(2), 53-62.

Kwon, C. S., Shin, T. S., & Bacon, F. W. (1997). The effect of macroeconomic variables on stock market returns in developing markets. *Multinational Business Review*, 5(2), 63-70.

Malhotra, N. K. (2024). *Marketing Research: An Applied Orientation*. Pearson Education.

Malkiel, B. G., & Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2), 383-417. https://doi.org/10.1111/j.1540-6261.1970.tb00518.x

Nguyen, T. D., & Elisabeta, P. (2016). Financial integration and diversification benefits: China and ASEAN4 countries. *Managerial Finance*, 42(5), 496-514. https://doi.org/10.1108/MF-12-2014-0300

Nyakurukwa, K., & Seetharam, Y. (2023). Quantile and asymmetric return connectedness among BRICS stock markets. *The Journal of Economic Asymmetries*, 27, e00303. https://doi.org/10.1016/j.jeca.2023.e00303

Oktarina, D. (2016). Pengaruh beberapa indeks saham global dan indikator makroekonomi terhadap pergerakan IHSG. *Journal of Business and Banking*, 5(2), 163-182. https://doi.org/10.14414/jbb.v5i2.701

Palamalai, S., & Devakumar, C. (2013). Stock market linkages in emerging Asia-Pacific markets. *Sage Open*, 3(4), 2158244013514060. https://doi.org/10.1177/2158244013514060

Pareek, A. (2023). Examine consumer understanding and behavior. *Journal of Namibian Studies*.

Pinem, D. B. (2019). Analysis of global stock exchange index, foreign exchange rate, interest rate, and inflation rate influences on CSPI in Indonesia Stock Exchange (Period of January 2014-2015). *European Journal of Business and Management Research*, 4(6). https://doi.org/10.24018/ejbmr.2019.4.6.162

Preis, T., Kenett, D. Y., Stanley, H. E., Helbing, D., & Ben-Jacob, E. (2012). Quantifying the behavior of stock correlations under market stress. *Scientific Reports*, 2, 752. https://doi.org/10.1038/srep00752

Putra, A., & Setiawan, D. (2024). Do CEO characteristics affect earnings management? *Corporate Governance*. Emerald Publishing Limited. https://doi.org/10.1108/CG-02-2023-0078

Robiyanto, R. (2018). Indonesian stock market's dynamic integration with Asian stock markets and world stock markets. *Jurnal Pengurusan (UKM Journal of Management)*, 52, 291-301. https://doi.org/10.17576/pengurusan-2018-52-15

Robiyanto, R., Santoso, M. A., Atahau, A. D. R., & Harijono, H. (2019). The Indonesia Stock Exchange and its dynamics: An analysis of the effect of macroeconomic variables. *Montenegrin Journal of Economics*, 15(4), 59-73. https://doi.org/10.14254/1800-5845/2019.15-4.5

Ross, S. A. (1976). The arbitrage pricing of capital asset pricing. *Journal of Economic Theory*, 13, 341-360. https://doi.org/10.1016/0022-0531(76)90046-6

Sims, W. L. (1992). Affect of an attending an in-school opera performance on attitudes of fourth-fifth and sixth grade students. *Bulletin of the Council for Research in Music Education*, (114), 59-68.

Singh, P., Kumar, B., & Pandey, A. (2010). Price and volatility spillovers across North American, European, and Asian stock markets. *International Review of Financial Analysis*, 19(1), 55-64. https://doi.org/10.1016/j.irfa.2009.11.001

Thao, T. P., & Daly, K. (2012). The impacts of the global financial crisis on Southeast Asian equity markets integration. *International Journal of Trade, Economics, and Finance*, 3(4), 299-304. https://doi.org/10.7763/IJTEF.2012.V3.216