

Stock Market Integration of Asean+6 on Indonesia Composite Stock Price Index (Jkse)

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ABSTRACT :*The impact of economic globalization allow intertwined relationships and interplay between capital markets in the world. Attractive financial instruments and are commonly used as an alternative to investing in the stock market one of them is stock. This research aimed to analyze the relationship of the integration of ASEAN + 6 long term and short term stock market on Indonesia Stock Price Index (JKSE), to test the effect of ASEAN + 6 stock market shock on Indonesia Stock Price Index (JKSE) and provide managerial implications that could be performed by investors. Method that used in this study is VAR/VECM. Result show that PSEi, Kospi and BSESN have positive correlation toward JKSE, while SET, NZX50, and SSE have negative correlation toward JKSE. In short term, PSEi and Kospi show negative correlation toward JKSE. Stock price index KLSE, Nikkei225, STI and AORD show no influence toward JKSE. PSEi, Kospi and BSESN stock price index shock have effect to increasing JKSE in long term, while SET, NZX50, and SSE stock price index shock have effect to decreasing JKSE in long term. For those investors who invest in the BEI shall observe the movement of the stock price index of the Philippines (PSEit), the stock price index of the Republic of Korea (Kospi) and index stock price index of India (BSESN) as a reference or consideration for investment decisions. Investors from Indonesia may invest in Malaysia, Japan, Singapore and Australia where the three countries based on test VECM have no effect on Indonesia Composite Stock Price Index.*

KEYWORDS: *Integration, ASEAN+6, JKSE, VAR/VECM*

I. INTRODUCTION

The impact of economic globalization allow the interconnected and interplay relationships between capital markets around the world. Indonesian capital market offers a wide range of financial instruments as investment products with varying levels of risk and benefit. One of the most attractive financial instrument and commonly used as an alternative to investing in the capital market is market stock. Economic activity in the world today is becoming increasingly linked and depend on each other. Almost no country that does not relate with the outside world [1]. It can be seen from the incidence of the financial crisis that hit Asia in 1997, which resulted in shocks to the economy of the region. The adverse effects of the economic crisis that hit the countries in East Asia and Southeast Asia is the depreciation of the exchange rate of these countries with international currencies, including the US dollar by more than 30%.

This crisis leads to a change in the cooperation pattern among the East Asia countries. Post crisis has led to the creation of so many agreements, as well as the efforts that led to the establishment of the multilateral institution in economic areas, which is expected to improve understanding of the impact of the formed regional economic integration. Through the combination of ASEAN+3 (ASEAN, Republic of China, Japan, Korea, Australia, India and New Zealand) or commonly known as ASEAN+6.

The effects of the Indonesian economic relations with other countries, cause integration of the Indonesian capital market. Shocks originating from the market not only affect the market itself but also spread to other capital markets. According to Sakthivel et al [2], information on the fundamentals of a country's economy will spread to other markets, thus affecting other stock markets. Moreover, the adjacent located stock exchanges often have the same investors [3] and alteration in the stock exchanges will also be transmitted to other countries. On the other hand, the integrated stock market can help by providing information into more sophisticated investment opportunities. In theory, the relationship with the global market can provide all the benefits of financial integration, provide opportunities for capital improvements, a variety of investment products and risk diversification. The stock market is becoming more efficient, and able to create a mutual dependence between countries, particularly in one area so as to encourage the entry of capital inflow [4].

Capital market integration can be defined as the relationship between the capital markets of two or more countries if one of the markets experiencing shock within the change of stock price index and others will give good influence in the long and short term of integrated capital market. Its effect can be positive or negative. Correlation composite of stock price index in the long run between the capital market among countries was used to determine the level and the development of capital market integration [5].

Closer cooperation between capital markets and a country will certainly increase dependency and the role of capital markets on economic development. Figure 1 shows the general trend of the direction of movement (co-movement) between the Indonesian Composite Stock Price Index (JKSE) and the ASEAN+6 stock price index. The issue of interdependence and the general movement refers to the concept of cointegration [5]. The problem that occurs is how close linkages between Indonesia Composite Stock Price Index (JKSE) and the ASEAN+6 stock price index or the specific problem of how is the level of integration between the Indonesian stock market with the member of ASEAN+6.

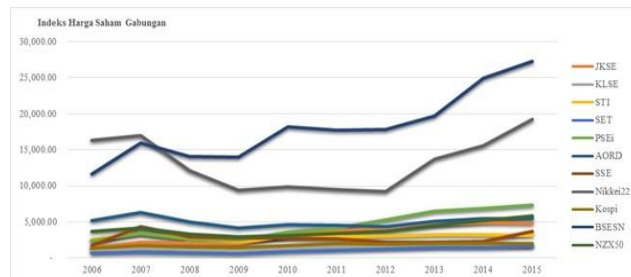


Figure 1 Composite Index Movement of ASEAN+6 Member Countries during 2006-2015 (Yahoo Finance 2015)

Based on background above, the purposes of this study were to analyze the relationship of the integration of ASEAN + 6 long term and short term stock market on Indonesia Stock Price Index (JKSE), to test the effect of ASEAN + 6 stock market shock on Indonesia Stock Price Index (JKSE) and provide managerial implications that could be performed by investors.

Overall paper will divided into several parts. The first section describes background and objective of the research. The second contains the literature review. The third contains the data and research methods. The fourth section contains result and discussion and the five section contains managerial implications based on the results. Finally, the last section is conclusions from the research and recommendations for future research.

II. LITERATURE REVIEW

There are many studies related to the integration of stock market. Utama and Artini [6] conducted a study to test the effect of Dow Jones, Nikkei 225, FTSE 100, and Straits Times on Indonesia Composite Stock Price Index during September 2008 to December 2013. The method used in this research was multiple linear regression. The test results through regression analysis technique showed that the Dow Jones (IDJ) and the Straits Times Index (IST) were constructed with partially positive effect on Indonesia Composite Stock Price Index, while the FTSE100 index and the Nikkei 225 had no effect on Indonesia Composite Stock Price Index.

Mie and Agustina [7] conducted a study to identify and analyze the influence of the Australian Securities Exchange Index, the FTSE 100 Index, Nikkei 225, the Shanghai Composite Index and the NYSE Composite Index simultaneously and partially on the Jakarta Composite Index (JKSE). The method used in this research is multiple linear regression. The data used in this study is monthly stock market price from January 2008 to December 2013. The results of this study showed that the variables ASX, FTSE 100, .N225, SSEC and NYA simultaneously significant effect on JKSE period 2008-2013. Partially, variable ASX, FTSE 100, N225, SSEC and NYA no significant effect on JKSE period 2008-2013.

Santosa [8] analyze the level of stock market integration of ASEAN and China. The analytical tool used is the Vector Model Correction Model (VECM). The data used are the monthly data period January 2000-September 2013, which consists of the composite stock price index data for Indonesia, Malaysia, Philippines, Singapore, Thailand and China. The results showed that the capital markets of Malaysia, the Philippines, Singapore, Thailand, and China's positive influence on the Indonesian capital market, but the Indonesian capital market does not affect the capital markets of other countries. Second, the Singapore stock market positive effect on capital markets of Indonesia, Malaysia, Thailand, and China, except the Philippines. Third, China's capital market only affect the capital market in Singapore. Singapore and Chinese stock market experienced a complete integration because they both affect each other. Fourth, the Philippine capital market only affect the Indonesian capital market.

Nurhayati [5] conducted a study to analyze the integration of capital markets ASEAN region. The method used is the Johansen cointegration approach and ARDL (Autoregressive Distributed Lag). Utilizing the composite stock price index data on the stock exchanges of Indonesia, Malaysia, Singapore, the Philippines and Thailand. The research proves that only the capital markets in Indonesia are significantly influenced by the capital markets of Malaysia, Singapore, Philippines, and Thailand. Capital markets do not affect each other. Thus, the capital market in the ASEAN region is integrated, but not entirely.

Musrizal [4] conducted a study to test the integration of stock markets Indonesia with Japan and India. The method used in this study is the Vector Error Correction Model (VECM). The data used in this study is the composite stock price index data daily from 3 market share. The period used in January 2009 - February 2011. The results of this study is to show that there are good relationships are short term or long term (disequilibrium) between the Indonesian stock markets with Japan and India.

Hasibuan and Hidayat [9] conducted a study to explain the relationship between global stock price indices (Nasdaq, Taixex, Nikkei and Kospi) against Indonesia Composite Stock Price Index. The method used in this research is multiple linear regression. The data used in this study is a stock index Year 2001-2008. These results indicate the contribution the influence of global stock price index variables (Nasdaq, Taixex, Nikkei and Kospi) affect the movement of the Indonesia Composite Stock Price Index.

III. RESEARCH METHODOLOGY

3.1 Data

The data used in this study is secondary data from January 2006 to December 2015, including monthly data of ASEAN+6 stock price index, JKSE for Indonesia, KLSE for Malaysia, STI for Singapore, SET for Thailand, PSEi for the Philippines, AORD for Australia, SSE for the People's Republic of China, Nikkei225 for Japan, Kospi for the Republic of Korea's, BSESN for India, and NZX50 for New Zealand. Stock price index data for each ASEAN+6 were transformed in natural logarithmic (ln). The type and source of the data used in this study can be obtained through journals, internet articles and other literature relating to the cases studied.

3.2 Sampling Method

From sixteen countries that join in ASEAN+6 chosen in this study are eleven countries, namely Indonesia, Malaysia, Singapore, Thailand, Filipina, Australia, the People's Republic of China, Japan, Republic of Korea, India, and New Zealand. The reason for choosing the country because:

a) The stock market in these country has been established long ago and has a long experience in the implementation of stock trading transactions both domestically and Internationally.

b) The stock markets in these countries have complete data about stock market indices, especially during the study period.

Meanwhile, ASEAN+6 countries such as Brunei Darussalam, Myanmar, Vietnam, Laos and Cambodia are not sampled in this study because of the country's underdeveloped capital market so that the data to be used as research is not enough. The sampling technique used in this research is purposive sampling, the sampling technique of data sources made certain considerations and do not deviate from the characteristics of the sample set [10].

3.3 Methods of Analysis and Data Processing

The analytical method used in this study is Vector Autoregressive (VAR) method and Vector Error Correction Model (VECM) method. Analysis of the data by using a model of VAR / VECM includes two analysis tools main Johannsen Cointegration Test, the method used to determine if the variables are not stationary cointegrated or not and Impulse Response Function (IRF), the method used to determine the response of a variable endogenous to a particular shock

The data processing is done in stages, before reaching the VAR and VECM analysis needs to be done some testing pre estimation called data stationerity test or unit root test, determination of optimum lag length, VAR stability test. Furthermore, the test will be conducted cointegration, VECM, and techniques Impulse Response Function (IRF). The software used for processing is Eviews 6.

3.4 Research Model

VAR equation model in the form of matrix notation used in this study to determine the relationship of the integration of long-term and short-term stock market ASEAN+6 on Indonesia Composite Stock Price Index (JKSE) and the effect of shocks stock market ASEAN+6 against JKSE, are as follows:

Model 1:

$$\begin{bmatrix} LnJKSE \\ LnKLSE \\ LnSTI \\ LnSET \\ LnPSEi \\ LnAORD \\ LnSSE \\ LnNikkei25 \\ LnKospi \\ LnBSESN \\ LnNZX50 \end{bmatrix} = \begin{bmatrix} a_{10} \\ a_{20} \\ a_{30} \\ a_{40} \\ a_{50} \\ a_{60} \\ a_{70} \\ a_{80} \\ a_{90} \\ a_{100} \\ a_{110} \end{bmatrix} + \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} & a_{15} & a_{16} & a_{17} & a_{18} & a_{19} & a_{10} & a_{11} \\ a_{21} & a_{22} & a_{23} & a_{24} & a_{25} & a_{26} & a_{27} & a_{28} & a_{29} & a_{210} & a_{211} \\ a_{31} & a_{32} & a_{33} & a_{34} & a_{35} & a_{36} & a_{37} & a_{38} & a_{39} & a_{310} & a_{311} \\ a_{41} & a_{42} & a_{43} & a_{44} & a_{45} & a_{46} & a_{47} & a_{48} & a_{49} & a_{410} & a_{411} \\ a_{51} & a_{52} & a_{53} & a_{54} & a_{55} & a_{56} & a_{57} & a_{58} & a_{59} & a_{510} & a_{511} \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & a_{66} & a_{67} & a_{68} & a_{69} & a_{610} & a_{611} \\ a_{71} & a_{72} & a_{73} & a_{74} & a_{75} & a_{76} & a_{77} & a_{78} & a_{79} & a_{710} & a_{711} \\ a_{81} & a_{82} & a_{83} & a_{84} & a_{85} & a_{86} & a_{87} & a_{88} & a_{89} & a_{810} & a_{811} \\ a_{91} & a_{92} & a_{93} & a_{94} & a_{95} & a_{96} & a_{97} & a_{98} & a_{99} & a_{910} & a_{911} \\ a_{101} & a_{102} & a_{103} & a_{104} & a_{105} & a_{106} & a_{107} & a_{108} & a_{109} & a_{1010} & a_{1011} \\ a_{111} & a_{112} & a_{113} & a_{114} & a_{115} & a_{116} & a_{117} & a_{118} & a_{119} & a_{1110} & a_{1111} \end{bmatrix}$$

$$\begin{bmatrix} JKSE_{t-1} \\ KLSE_{t-1} \\ STI_{t-1} \\ SET_{t-1} \\ PSEi_{t-1} \\ AORD_{t-1} \\ SSE_{t-1} \\ Nikkei25_{t-1} \\ Kospi_{t-1} \\ BSESN_{t-1} \\ NZX50_{t-1} \end{bmatrix} + \begin{bmatrix} e_{1t} \\ e_{2t} \\ e_{3t} \\ e_{4t} \\ e_{5t} \\ e_{6t} \\ e_{7t} \\ e_{8t} \\ e_{9t} \\ e_{10t} \\ e_{11t} \end{bmatrix}$$

Remarks:

- JKSEt : Indonesian Composite Stock Price Index period t (point)
- KLSEt : Malaysian Composite Stock Price Index period t (point)
- STIt : Singapore Composite Stock Price Index period t (point)
- SETt : Thailand Composite Stock Price Index period t (point)
- PSEit : Philipines Composite Stock Price Index period t (point)
- AORDt : Austarlian Composite Stock Price Index period t (point)
- SSEt : Chinese Composite Stock Price Index period t (point)
- Nikkei225t : Japan Composite Stock Price Index period t (point)
- Kospit : Korean Republic Composite Stock Price Index period t (point)
- BSESNt : India Composite Stock Price Index period t (point)
- NZX50t : New Zealand Composite Stock Price Index period t (point)
- a0 : Intercept
- aij : Variabel lag coefficient j for equation i
- eit : Error term

IV. RESULT AND DISCUSSION

4.1 Stationarity Test Result Data

The unit root test conducted prior to the current level, based on the ADF test has been done obtained all the variables are not stationary at the current level but stationary in first difference level.

Table 1 Datastationarytest results

| Variabel | ADF Value | |
|--------------|-----------|------------------|
| | Level | First Difference |
| Ln_JKSE | -1.92557 | -8.202137 |
| Ln_KLSE | -1.746011 | -9.020868 |
| Ln_STI | -2.4628 | -8.65877 |
| Ln_SET | -0.734805 | -8.992341 |
| Ln_PSEi | -1.038395 | -10.0453 |
| Ln_AORD | -1.633665 | -9.033455 |
| Ln_SSE | -2.410316 | -9.243476 |
| Ln_Nikkei225 | -0.871595 | -9.103236 |
| Ln_Kospi | -1.920362 | -10.362 |
| Ln_BSESN | -1.756347 | -9.644892 |
| Ln_NZX50 | 0.234261 | -9.112156 |

Note: Bold lettersindicatestationary at5% significance level.

Source: Eviews 6 software output

4.2 Optimum Lag Test Result

The amount of lag is selected in this study will be searched by using the criteria of Schwarz Information Criterion (SC). SC smallest value contained in a lag in the amount of -37.99870, thus lag used in the model is a lag of one.

Table II Optimum lag test result stock price index ASEAN+6

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|-----|----------|----------|----------|-----------|------------|------------|
| 0 | 1346.114 | NA | 1.23e-24 | -23.84133 | -23.57433 | -23.733 |
| 1 | 2442.577 | 1957.968 | 3.37e-32 | -41.26029 | -38.05635* | -39.96035* |
| 2 | 2543.020 | 159.6329 | 5.15e-32 | -40.89321 | -34.75231 | -38.40165 |

Note: * lag optimal.
Source: Eviews 6 software output

4.3 VAR Stability Test Results

Based on VAR stability test, the modulus values of all roots have less than one, so it can be concluded that the VAR model that used in this study had been stabilized at the optimal lag (lag one).

Table III VAR stability test results

| Root | Modulus |
|----------------------|----------|
| 0.987686 - 0.023553i | 0.987967 |
| 0.987686 + 0.023553i | 0.987967 |
| 0.965251 | 0.965251 |
| 0.889439 | 0.889439 |
| 0.830261 | 0.830261 |
| 0.784815 - 0.069257i | 0.787865 |
| 0.784815 + 0.069257i | 0.787865 |
| 0.647119 | 0.647119 |

Source: Eviews 6 software output

4.4 Cointegration Test

The models used in this study had 3 cointegration equations between ASEAN + 6 stock price index. Cointegration equation showed that all variables tested have stationary linear combination (cointegration), so the VECM model performed appropriately in this study.

Table IV Trace statistic Johansen test results stock price index ASEAN+6

| Hypothesized | Eigenvalue | Trace | 0.05 | |
|--------------|------------|-----------|----------------|---------|
| No. of CE(s) | | Statistic | Critical Value | Prob.** |
| None * | 0.460567 | 358.5302 | 298.1594 | 0.0000 |
| At most 1 * | 0.438592 | 285.6962 | 251.2650 | 0.0006 |
| At most 2 * | 0.344101 | 217.5739 | 208.4374 | 0.0168 |
| At most 3 | 0.296861 | 167.8077 | 169.5991 | 0.0619 |

Source: Eviews 6 software output

4.5 ASEAN+6 Composite Stock Price Index Vector Error Correction Model (VECM) Analysis

VECM estimation describing the relationship balance short-term and long-term balance in a system of equations. The estimation results of VECM in this study will indicate a combination of short-term relationships and long term between Indonesia Composite Stock Price Index (JKSE) ASEAN + 6 with the stock price index (KLSE, PSEi, SET, Kospi, BSESN, Nikkei225, STI, NZX50, SSE, AORD).

In the long-term changes in the stock price index, the Philippines, Republic of Korea and India were positively related to Composite Stock Price Index Indonesia (JKSE). This result is same as study that has been done by Nurhayati [5] which stated that there was a positive correlation between stock price index Philippines with Composite Stock Price Index Indonesia, Hasibuan and Hidayat [9] which stated that there was a positive

correlation between stock price index of Korean Republic and Indonesia Composite Stock Price Index (JKSE), Musrizal [4] which stated that there was a positive correlation between stock price index of India with Indonesia Composite Stock Price Index (JKSE). Those finding showed that the higher the index will further increase the Indonesia Composite Stock Price Index (JKSE). The existence of a strong economic relationship between Indonesia and the Philippines, the Republic of Korea and India resulted in stock market linked among those countries.

VECM estimation results in the short term show that the stock price index of the Philippines and the Republic of Korea had negative correlations with the Indonesia Composite Stock Price Index (JKSE). This was due to the influence of the financial crisis in Asia in 2007, caused by the destruction of the US stock market index (DowJones) related to subprime mortgage problems at the end of 2007, had a negative impact on the global capital markets to the Indonesian capital market. Based on Table 4.5 it can be seen that the development of the stock capital flows in Republic of Korea for the first 2 years after the subprime mortgage crisis in 2008-2009 has been decreased and remained for the Philippines and during 2010-2011 the stock capital flows was comeback.

Table V Flow of the share capital of the Philippines and the Republic of Korea 2008-2011

| Year | Country | |
|------|------------------------|----------------------------|
| | Philippines (USD Juta) | Korean Republic (USD Juta) |
| 2008 | 1 | 87 |
| 2009 | 1 | 40 |
| 2010 | 2 | 147 |
| 2011 | 9 | 192 |

Source: Bank Indonesia 2015.

Based on the VECM test results, stock price index of Malaysia, Japan, Singapore and Australia did not have an influence on the Indonesia Composite Stock Price Index (JKSE). It can be caused the state does not invest in stocks, but in the form of real investment. According to BKPM data, in the first half of 2014, Malaysian investment stood at US \$ 1.8 billion total increased sharply to US \$ 2.69 billion in the first half 2015, second place is occupied by Singapore amounted to US \$ 2.3 billion and Japan \$ 1.6 billion, while Australia does not invest in stocks, but in the form of real investment, one of them in the field of livestock, namely investment in cattle farms [7].

This is same with study conducted by Mie and Agustina [7] which states that the partial stock price index of Japan and Australia has no effect on Composite Stock Price Index Indonesia. Utama and Artini [6] states that the stock price index of Japan did not affect the Composite Stock Price Index Indonesia.

4.6 Results of Impuls Response Function (IRF)

This analysis measures the change in the response of each variable to the shock that occurs in one variable by using one standard deviation. The following will be displayed results of IRF influence stock price index ASEAN + 6 (KLSE, PSEi, SET, KOSPI, BSESN, Nikkei225, STI, NZX50, SSE, AORD) on Indonesia Composite Stock Price Index (JKSE).

Table VI Results of IRF stock price index, ASEAN+6 against JKSE

| Stock Price Index | Response | Month | Value |
|-------------------|----------|-------|---------------|
| KLSE | Increase | 17 | 0.017694% |
| PSEi | Increase | 25 | -0.034101% |
| SET | Decrease | 17 | -0.012215% |
| KOSPI | Increase | 21 | 0.019777 %. |
| BSESN | Increase | 21 | 0.026712 %. |
| Nikkei225 | Decrease | 23 | -0.001345% |
| STI | Decrease | 17 | -0.00020970% |
| NZX50 | Decrease | 13 | -0.0064800% |
| SSE | Decrease | 17 | -0.0045550 %. |
| AORD | Increase | 19 | 0.0089280 %. |

Source: Eviews 6 software output

Based on the above table it can be seen that where there are shocks of the stock price index KLSE, PSEi, Kospi, BSESN, and AORD have an impact on the increase of Indonesia Composite Stock Price Index (JKSE) in long term, while the stock price index, SET, Nikkei225, STI, NZX50, and SSE have an impact on the decrease of the Indonesia Composite Stock Price Index (JKSE) in long term.

V. MANAGERIAL IMPLICATIONS

For those investors that would make investment in the BEI shall observe the movement of the stock price index of the Philippines (PSEit), the stock price index of the Republic of Korea (Kospi) and stock price index of India (BSESN) as a reference or consideration for investment decisions because based on this study, the composite stock index from those countries have positive effect on JKSE. Analysis of movements in long-term (cointegration) stock market have important implications for international portfolio management and risk diversification. Investors from Indonesia may invest in Malaysia, Japan, Singapore and Australia where the three countries based on VECM test have no effect on Indonesia Composite Stock Price Index (JKSE) and indicating that the degree of stock price index integration with the Indonesia Composite Stock Price Index (JKSE) is low and the low degree of integration provides an opportunity benefits of international portfolio diversification.

VI. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

Based on the above study it can be concluded that the long-term changes in stock price index Philippines, Republic of Korea and India are positively related to Indonesia Composite Stock Price Index (JKSE) while the stock price index of Thailand, New Zealand, and China are negatively related to Indonesia Composite Stock Price Index (JKSE). In the short term stock price index Philippines and the Republic of Korea have negative correlations with Indonesia Composite Stock Price Index (JKSE). Stock price index in Malaysia, Japan, Singapore and Australia have no influence on the Indonesia Composite Stock Price Index (JKSE). The shocks of PSEi, Kospi, and BSESN have an impact on the increase of Indonesia Composite Stock Price Index (JKSE) in long term, while the shocks of the SET, NZX50, and SSE have an impact on the decrease of the Indonesia Composite Stock Price Index (JKSE) in long term.

6.2 Recommendations

Based on this study, there are some suggestions that can be apply such as:

- 1) The results showed that not all of the price index owned by ASEAN + 6 member countries has an influence on the JKSE Indonesia. Hence, with the remaining low of the integration degree, Indonesian government could take advantage of opportunities for unification (integration) of ASEAN stock markets in order to strengthen the structure of it, because the ASEAN integrated stock market can improve the market efficiency and competitiveness with other regions.
- 2) For further research may add a variable other ASEAN integrated countries as well as to test the two-way causality between countries with different integration methods in order to see more clearly the relationship between the stock market integration in other ASEAN countries.

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