Co-Integration and Contagion Effect in Republic of Tiongkok and Asean Stock Market during The Economic Slowdown in Republic of Tiongkok

Nur Chalimah✉, Rini Setyo Witiastuti

Management Department, Faculty of Economics, Universitas Negeri Semarang, Semarang, Indonesia

Abstract

This study aims to find empirical evidence of the relationship of co-integration and contagion effect on the stock market in the People's Republic of Tiongkok and ASEAN during economic slowdown in the People's Republic of Tiongkok in 2015-2017. The samples in this study were the stock market of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. The data used in the study are secondary data from the Composite Stock Price Index obtained from www.bloomberg.com. The research method used in this study is Vector Autoregression (VAR). The test results show that economic slowdown in the People's Republic of Tiongkok has no effect on the average JCI of the People's Republic of Tiongkok and ASEAN. There is co-integration in the average JCI of the People's Republic of Tiongkok and ASEAN. The average Indonesian JCI is not affected by the JCI average of the People's Republic of Tiongkok and ASEAN. There is contagion effect on the average JCI of the People's Republic of Tiongkok and ASEAN. Based on the results of the study it were concluded that co-integration and contagion effects occurs on the average JCI in the People's Republic of Tiongkok and ASEAN when economic slowdown occurs.

INTRODUCTION

The People's Republic of Tiongkok is a country that has a major influence on the world economy besides the United States. The economic growth of the People's Republic of Tiongkok is illustrated by the size of the Gross Domestic Product (GDP). Since 1992-2017 the average GDP of the People's Republic of Tiongkok has amounted to 9.74%. Among the series of periods, 2016 shows the lowest percentage of GDP, which is 6.7%. The large percentage is evidence that in 2016 the People's Republic of Tiongkok experienced an economic slowdown. The economic slowdown of the People's Republic of Tiongkok is caused by the transition of economic growth from export-based and investment to consumption and service-based (Arslanalp et al., 2016).

The economic slowdown of the People's Republic of Tiongkok has an impact on the People's Republic of Tiongkok and other countries. For the People's Republic of Tiongkok the price of exports and the amount of imports to the People's Republic of Tiongkok have declined. The decline in imports as one of the effects of the policy carried out by the Government of the People's Republic of Tiongkok, namely the devaluation of Renmibi (currency of the People's Republic of Tiongkok). Concerns about trading partners in the economy of the People's Republic of Tiongkok are not a good factor, because they judge the economy of the People's Republic of Tiongkok is really in an emergency until the currency devaluation policy (Pratama, 2017). In addition to these two impacts, another impact is not only felt by the People's Republic
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of Tiongkok but also other countries is the stock market value which shows that the Composite Stock Price Index has decreased.

Capital markets as instruments in the economy of a country cannot be separated from economic or non-economic influences (Ardiansari & Saputra, 2016). Thus, the Renmibi devaluation policy that has an effect on the economy will affect the capital market. The average JCI of the People's Republic of Tiongkok in 2015 amounted to 3691.68 then in 2016 amounted to 3009.06. Other countries affected by the decline in the JCI are ASEAN member countries. According to www.bloomberg.com there are 7 ASEAN member countries that have a Stock Price Index, namely Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. The average Indonesian CSPI in 2015 amounted to 4916.58, then in 2016 amounted to 5025.90. The average Laos CSPI in 2015 was 1347.26, then in 2016 amounted to 1086.94. The average Malaysian CSPI in 2015 amounted to 1728.06, then in 2016 amounted to 1661.15. The average CSPI in the Philippines amounted to 7436.86, then in 2016 it amounted to 7285.86. The average Singapore CSPI in 2015 was 3210.56, then in 2016 it amounted to 2851.30. The average Thai CSPI in 2015 amounted to 1467.68, then in 2016 amounted to 1432.85. The average Vietnamese CSPI in 2015 amounted to 580.34, then in 2016 amounted to 625.74. The average CSPI declined in 2016 as the economic slowdown of the People's Republic of Tiongkok took place. Concerns of investors that they will experience heavy losses when the economy of a country declines which results in a decline in the CSPI to be the cause. Rational opinion from investors circulating in the market can affect price changes (Cahyaningdyah & Witiastuti, 2010). Changes in stock prices are one form of market reaction resulting from information circulating, both economic / non-economic information and only investor opinion. The rational opinion of investors who consider the information they obtain as good news makes investors give high demand for stock prices, on the contrary, if the information they obtain is considered as bad news, investors will provide low share price requests (Maharani & Witiastuti, 2015).

According to the results of the study (Simbolon & Purwanto, 2018) GDP has a positive effect on the CSPI, meaning that when GDP increases, the CSPI will also increase, and when GDP declines, the CSPI will also decline. The results of the study illustrate that the economic growth of the People's Republic of Tiongkok which is described through GDP will affect the CSPI of the People's Republic of Tiongkok. CSPI 7 ASEAN member countries. In addition to the decline in the CSPI, there was also a decline in the volume of stock trading. This is because investors take advantage of information obtained as an analytical material for investment decision making, thus allowing changes in trading volume (Nurmalasari & Yulianto, 2015). The average volume of stock trading in the stock market of the People's Republic of Tiongkok and 7 ASEAN member countries has decreased.

Events that occur in a country will affect the events of other countries, especially those in one area (Harjito, 2010). This means that the People's Republic of Tiongkok Stock Market and 7 ASEAN member countries have integration. Capital markets can be said to be integrated if the stock prices in various capital markets in the world have a relationship between the capital markets of one country and another, so that capital markets can reach international prices for their shares and provide unlimited opportunities for investors who want to invest in other countries (Mailangkay, 2013). Capital Market in Indonesia is small and less liquid compared to other ASEAN countries' capital markets, this is due to low public knowledge about financial conditions (Harlina & Khoiruddin, 2018). However, the era of the ASEAN Economic Community (MEA) contributed to the increase of business competition and investment in Indonesia, so that investment is currently a necessity of the people in Indonesia (Partono et al., 2017). Investment competition in Indonesia is strongly supported by the Capital Market in Indonesia, because since 1989 there has been a policy regarding the purchase of shares by foreign investors that allows investment competition to occur with local investors.

Through the Decree of the Minister of Finance of the Republic of Indonesia No.179 / KMK.010 / 2003 concerning Share Ownership and Capital Securities Companies stipulates that Securities Company Shares can be owned by Foreign Legal Entities engaged in finance

other than securities with a maximum of 85% of paid-up capital whereas if already acquired permits under the supervision of the Capital Market regulator of their home country a maximum of 99% of paid up capital (Section 2) (www.ojk.go.id, 2019).

The policy set by the Minister of Finance of the Republic of Indonesia, indirectly provides the potential for the integration of the Indonesian stock market with the stock market in several countries. This was evidenced through the results of a report from the Indonesian Capital Market Volatility team in 2011 that foreign capital had controlled share ownership in the Indonesia Stock Exchange of 63.43% and the achievement of foreign capital trading amounted to 33.76% of the total stock transaction value (Setiawan & Wijayanto, 2017). Then, in 2016 the Indonesian Central Securities Depository (KSEI) reported that share ownership in the Indonesia Stock Exchange was still dominated by foreign investors by 64% (Chakimatuzzahroh & Witiastuti, 2018).

If an integrated and cointegrated stock market will provide benefits to portfolio diversification for investors, investors must pay attention to the level of risk that will be accepted (Kearney & Lucey, 2004). Various portfolio diversification techniques that compare the rate of return and risk will help investors make investment decisions (Witiastuti, 2013). In addition to seeing returns and risks, investors must know the ability of the issuer to generate revenue. Through income information, investors are given the opportunity to know the benefits to be gained if they own a share (Wijayanto, 2010). The content of information provided by the issuer or public in order to produce a maximum return and avoid losses, is a reminder for investors to make investment decisions to be careful (Khoiruddin & Faizati, 2015). The ability of the issuer can be seen not only from income, but also from dividend payments. Guarantee that the issuer will make a dividend payment can increase the value of the issuer (Yulianto, *et al.*, 2014). Economic slowdown that has the potential to affect stock prices, gives a signal to investors to be more careful in investing, by looking for information on returns, risks and dividends to be received.

The phenomenon of the response of the same stock price movements at the time of economic slowdown in the People's Republic of Tiongkok raises the suspicion that a Contagion Effect has occurred. Shock the economic slowdown of the People's Republic of Tiongkok is transmitted to the average changes in the CSPI of the People's Republic of Tiongkok and transmitted to 7 ASEAN member countries, this is in accordance with the Broad Definition Contagion Effect according to the World Bank. Contagion Effect describes when a country experiences a crisis, other countries will be hit by another crisis as a result (Sofa, 2015). According to Eichengreen et al., (1996), one of the causes of Contagion Effect is the existence of trade relations. As is known, that Tiongkok and ASEAN have agreed with the ACFTA agreement (ASEAN-Cina Free Trade Agreement) (Santosa, 2017).

Several studies have been conducted by researchers, the results vary due to differences in case studies and the time of the study used. The results of research on integration, Kenourgios et al. (2011) show that during the crisis period the correlation between stock price indexes increased and contagion effects occurred both when stable or crisis, Yunus (2013) showed international financial markets (North America, Asia Europe and America Latin) mutual integration in the long run. This result is inversely proportional to that, Yang and Lim (2004) shows that there is no cointegration in the stock market in East Asia and Moldovan and Medrega (2011) shows that before the third crisis the high stock exchange correlation crisis occurred. However, in the event of a correlation crisis the three exchanges experienced a decline. Then, the results of research on contagion effects, Horta (2013) showed that the contagion effect only occurred in the Portuguese stock market, Harjito (2010) showed that there was a contagion effect in all ASEAN shares. This result is inversely proportional to that, Horta (2013) which shows that the Dutch, Belgian, French and Greek stock markets have no contagion effect and Sofa (2015) shows that all Asian IHS in the short term have no potential for contagion effects to Japan and Tiongkok CSPI.

The results of the research gap indicate that the integration and occurrence of contagion effects on the capital market in one region is still different. Based on the phenomenon and

research gap that occurs, the researcher will test Co-Integration and Contagion Effect on the average CSPI of the People's Republic of Tiongkok and 7 ASEAN member countries when there is economic slowdown in the People's Republic of Tiongkok.

Hypotheses Development
Economic Slowdown in the People's Republic of Tiongkok affects the CSPI average of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam

The results of the study by Federova *et al.* (2014) state that GDP can influence the reaction in the stock market, then the results of Simbolon & Purwanto's research (2018) prove that GDP has a positive effect on stock prices. Referring to the contagion effect theory, the impact of the economic slowdown shocks depicted in the decline in GDP will affect the Composite Stock Price Index in the People's Republic of Tiongkok, then the effect will be transmitted to the 7 ASEAN member countries' Composite Stock Price Index. This statement is supported by the results of research (Kenourgios et al., 2011; Kizys & Pierdzioch, 2011; Moldovan & Medrega, 2011)

H1: Economic Slowdown of the People's Republic of Tiongkok influences the CSPI average of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam

There is a cointegration relationship on the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam when economic slowdown occurs in the People's Republic of Tiongkok

Harjito's research (2010) states that events that occur in a country will affect the events of other countries, especially countries in one region. Wondabio's (2006) research states that a strong state economy will affect weak countries' economies and countries with strong capital will excel in transactions, so that the CSPI which acts as one of the macroeconomic variables, concludes that the country's strong CSPI will affect the weak CSPI. The People's Republic of Tiongkok and 7 ASEAN member countries which are in one region, namely

the Asia Pacific will mutually integrate if one country experiences a good event in the form of an event that has a positive or negative impact on its country. This statement is supported by the results of the study (Kizys & Pierdzioch, 2011; Nurhayati, 2012; Puspitasari et al., 2015; Santosa, 2012; Sofa, 2015).

H2: There is a cointegration relationship on the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam when there is economic slowdown in the People's Republic of Tiongkok.

The average CSPI in Indonesia is affected by the CSPI average of the People's Republic of Tiongkok, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam during economic slowdown in the People's Republic of Tiongkok.

Wondabio's (2006) research states that a strong state economy will affect weak countries' economies and countries with strong capital will excel in transactions, so that the CSPI which acts as one of the macroeconomic variables, concludes that the country's strong JCI will affect the weak CSPI. Based on the Decree of the Minister of Finance of the Republic of Indonesia No.179 / KMK.010 / 2003 concerning Stock Ownership and Capital Securities Companies quoted from (www.ojk.go.id, 2019) stipulates that Securities Company Shares can be owned by Foreign Legal Entities engaged in finance other than securities with a maximum of 85% of paid-up capital whereas if it has obtained a permit under the supervision of the Capital Market the country of origin is a maximum of 99% of paid-up capital (Section 2). The decision of the Minister of Finance of the Republic of Indonesia, allows foreign investors to dare to invest in Indonesia. The CSPI in Indonesia indirectly has the potential to be influenced by the CSPI from other countries' exchanges, one of them is from one region in Asia. This statement is supported by the results of the study (Argamaya & Habsari, 2013; Andiyasa et al., 2014; Santosa, 2017 Pamungkas & Darmawan, 2018; Sakul, 2018;)

H3: The average Indonesian CSPI is affected by the CSPI average of the People's Republic of Tiongkok, Laos, Malaysia, the Philip-

pines, Singapore, Thailand and Vietnam during economic slowdown in the People's Republic of Tiongkok

There is a potential contagion effect on the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam in the event of economic slowdown in the People's Republic of Tiongkok.

The World Bank defines contagion effect as a process of shock that is transmitted between countries either in a crisis or stable (Lee, 2012). This means that in this study the effects of the economic slowdown shock of the People's Republic of Tiongkok will be transmitted not only to the sense of the People's Republic of Tiongkok, but also other countries, including ASEAN member countries that have a stock price index. The existence of their country in one region increasingly gives the suspicion of the potential for contagion effects to occur in their country's Capital Market. Research from Harjito (2010) states that events that occur in a country will affect the events of other countries, especially countries in one region. The results of the study (Kenourgios et al., 2011; Trihadmini, 2011; Lee, 2012; Sofa, 2015; Ikrima & Muharam, 2015) support that a country affected by a shock, contagion effects will occur to other countries, both countries in one regions and countries that are not in one area.

H4: There is a potential contagion effect on the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam during economic slowdown in the People's Republic of Tiongkok.

METHOD

This research is in the form of quantitative research using average secondary data monthly Composite Stock Price Index (CSPI) obtained from Weekly data from 2015-2017 which is accessed from the web www.bloomberg.com. Data collection has done through documentation, namely paying attention to CSPI per week.

The population in this study is the stock market in the People's Republic of Tiongkok

and ASEAN. The sample in this study was the stock market in the People's Republic of Tiongkok and 7 ASEAN member countries which were selected through a stratified random sampling technique. Based on the stratified random sampling technique, obtained samples of ASEAN member countries to be used in this study were Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. Thus, the sample used in this study is 8 stock indices from 8 countries, namely the People's Republic of Tiongkok (SSEC), Indonesia (JCI), Laos (LSXC), Malaysia (KLCI / KLCI), Philippines (PSEi), Singapore (STI), Thailand (SET) and Vietnam (VNI), with observations for 3 years starting from 2015-2017. The number of observations in this study was 288 observations.

The data used in this study is real data obtained from www.bloomberg.com which is then processed by calculating the average size. The proxies used in this study are as follows:

$$\text{Index} = \frac{\Sigma \text{Market Value}}{\Sigma \text{Basic Value}} \times 100\%$$

(Anoraga & Pakarti, 2008; Ary, 2011). Then, from the Index results per week obtained, the Index per month is calculated with the proxy as follows:

$$\text{CSPI Average} = \frac{\Sigma \text{Weekly Stock Price}}{n}$$

The data analysis method used in this study is the Vector Autoregression (VAR) analysis method to test hypotheses using software E-Views version 6.

RESULTS AND DISCUSSION

The stages of analysis in this study are descriptive statistical test, data stationarity test, optimal lag length test, VAR stability test, cointegration test, granger causality test, classic assumption test, VAR regression model test, Impulse Response Function analysis and Variance Decomposition (Basuki & Prawoto, 2016).

Table 1 will show the results of the descriptive statistical test. Descriptive statistical tests will describe the values of Mean, Median, Maximum, Minimum and Standard Deviation (Ghozali, 2016).

Table 1. Descriptive Statistics Test Results

Varible	*Mean*	Median	Maximum	Minimum	St Deviasi
SSEC	3312.785	3212.185	4715.170	2796.910	413.4262
JCI	5227.574	5270.505	6135.840	4341.390	492.9441
LSXC	1157.617	1114.950	1506.970	994.7700	155.6479
KLCI	1710.935	1705.905	1846.820	1616.720	61.32012
PSEi	7525.990	7525.990	8371.450	6574.540	472.2356
STI	3098.111	3119.185	3491.080	2617.350	252.9157
SET	1503.981	1517.275	1723.930	1269.410	111.6860
VNI	660.6908	639.0300	954.4400	549.9200	100.9976

Table 2 will show the results of the data questionnaire test. The data stationarity test is used to test whether the sequential data time used in this study has been stationary / not. The results of Table 2 show that the probability value of research data in each variable has a value of <0.05 on the second difference level. That is, that the data has been stationary at the second difference level. Then it can be continued in the next step, namely the optimal lag length test.

Table 3 will show the optimal lag length test results. Lag testing is used so that the models used in the study can be explained dynamically and efficiently. The optimal lag will be selected by E-Views which is indicated by the number of stars next to the numbers. The results from Table 3 show that the highest stars are at Lag 0, so Lag can be selected with the lowest AIC value (Gujarati, 2012 in www.diassatria.com, 2018), between Lag 1 or 2, Lag 1 is selected. In conclusion, the average JCI all countries in the 2015-2017 period

Table 2. Data Stationarity Test Results

Variable	Level		First Difference		Second Difference	
	Prob	Information	Prob	Information	Prob	Information
SSEC	0.0692	not stationary	0.2591	not stationary	0.0000	stationary
JCI	0.9719	not stationary	0.0154	not stationary	0.0000	stationary
LSXC	0.6193	not stationary	0.0002	stationary	0.0000	stationary
KLCI	0.3771	not stationary	0.0017	stationary	0.0001	stationary
PSEi	0.4333	not stationary	0.0023	stationary	0.0000	stationary
STI	0.6067	not stationary	0.0000	stationary	0.0000	stationary
SET	0.9338	not stationary	0.0049	stationary	0.0001	stationary
VNI	1.0000	not stationary	0.0159	stationary	0.0000	stationary

Table 3. Optimal Lag Length Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1531.917	NA	4.70e+30	93.32830	93.69109*	93.45037
1	-1427.841	151.3826*	4.64e+29*	90.89948	94.16459	91.99809*
2	-1352.894	72.67590	5.11e+29	90.23602*	96.40345	92.31118

are in lag 1.

Table 4 will show the results of the VAR stability test. The VAR stability test is used to check whether the VAR is stable or not. The results from Table 4 show that the VAR is stable in the modulus range <1.

Table 4. VAR Stability Test Results

Root	Modulus
0.373099 - 0.742881i	0.831309
0.373099 + 0.742881i	0.831309
-0.408130 - 0.676596i	0.790160
-0.408130 + 0.676596i	0.790160
0.533394 - 0.556154i	0.770595
0.533394 + 0.556154i	0.770595
0.001726 - 0.612488i	0.612491
0.001726 + 0.612488i	0.612491
-0.552729	0.552729
-0.445130 - 0.244007i	0.507622
-0.445130 + 0.244007i	0.507622
0.477777 - 0.154671i	0.502189
0.477777 + 0.154671i	0.502189
0.022119 - 0.376553i	0.377202
0.022119 + 0.376553i	0.377202
0.161185	0.161185

Table 5 and Table 6 will show the results of the cointegration test. Cointegration test is used to test whether there is a balance relationship in the long run indicated by the same movement and the stability of the relationship between variables. The cointegration test used in this study was Johansen's Cointegration Test. The results from Tables 5 and 6 show that there is cointegration between the average variables of the CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. This is shown

in r = 0 Trace Statistic and Max Eigen Statistic which has a value greater than the Critical value with a significance of 5%. Meanwhile, to see short-term relationships, using VECM ana-

lysis (see Attachment 1) shows that the average CSPI SSEC, LSXC, KLCI, PSEi, STI, SET and VNI have a short-term relationship when economic slowdown occurs in the People's Republic of Tiongkok, except for variables average CSPI JCI. This is indicated by the t-statistical value, if the statistical value is> 1.650162, a short-term relationship occurs.

Table 5. Cointegration Test Results Unrestricted Cointegration Rank Test (Trace)

Hypoth-esized		Trace	0.05	
No. of CE(s)	Eigen-value	Statistic	Critical Value	Prob.**
None *	0.836136	217.4862	159.5297	0.0000
At most 1 *	0.763886	157.7984	125.6154	0.0001
At most 2 *	0.663199	110.1648	95.75366	0.0035
At most 3 *	0.554656	74.25216	69.81889	0.0212
At most 4	0.467927	47.55821	47.85613	0.0533
At most 5	0.307741	26.73602	29.79707	0.1082
At most 6	0.205309	14.59877	15.49471	0.0679
At most 7 *	0.191508	7.015308	3.841466	0.0081

Table 6. Cointegration Test Results Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypoth-esized		Max-Eigen	0.05	
No. of CE(s)	Eigen-value	Statistic	Critical Value	Prob.**
None *	0.836136	59.68778	52.36261	0.0076
At most 1 *	0.763886	47.63359	46.23142	0.0352
At most 2	0.663199	35.91265	40.07757	0.1368
At most 3	0.554656	26.69395	33.87687	0.2801
At most 4	0.467927	20.82219	27.58434	0.2871
At most 5	0.307741	12.13725	21.13162	0.5342
At most 6	0.205309	7.583463	14.26460	0.4226
At most 7 *	0.191508	7.015308	3.841466	0.0081

Tables 7 and 8 show VAR estimates with t-table 1,650162 (n = 288). Results Tables 7 and 8 show that in 2015-2017, the average CSPI SSEC was influenced by the average CSPI LSXC; the average CSPI KLCI was influenced by the average CSPI JCI and the average CSPI KLCI; the average CSPI PSEi was influenced by the average CSPI LSXC and the average CSPI PSEi; the average CSPI STI was influenced by the average CSPI STI and the average CSPI VNI; The average CSPI SET was influenced by the average CSPI KLCI. In conclusion, the economic slowdown in the People's Republic of Tiongkok, did not affect the average CSPI in Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam, which were seen from the country's average CSPI which affected the average CSPI SSEC.

Table 7. VAR Estimation Results

D(X(-1))	D SSEC	D JCI	D LSXC	D KLCI
SSEC	0.23186	-0.20781	-1.12014	0.69983
JCI	0.05441	2.36091	-0.07365	2.20420
LSXC	1.87503	0.93639	0.36821	0.84057
KLCI	0.83177	-1.64455	0.66289	-1.85870
PSEi	-0.77500	0.01158	-1.34305	-0.41407
STI	-0.03448	0.77976	0.30259	0.09675
SET	-0.02131	-0.32886	0.39980	-0.94709

Table 8. VAR Estimation Results

D(X(-1))	D PSEi	D STI	D SET	D VNI
SSEC	-1.28240	1.12376	-0.74026	1.60801
JCI	0.38292	0.82619	0.86570	0.43611
LSXC	1.99408	0.56929	1.51459	-0.52823
KLCI	-1.29095	0.00649	-2.14196	-1.52233
PSEi	1.66966	-0.63592	0.63823	0.20013
STI	0.09860	-2.51421	1.48107	-0.15886
SET	0.45783	0.62560	0.43750	0.45097

Table 9 will show the results of the Granger's Causality Test. Granger Causality Test is used to determine the existence of causality relationships (two-way relationships) between two variables. The results from Table 9 show that only the average CSPI STI variable has a causality relationship (two-way relationship) with the average CSPI PSEi. This is indicated by the probability value <0.05.

Table 9. Causality Test Results Granger (Granger's Causality Test)

Null Hypothesis:	Obs	F-Statistic	Prob.
D(STI) does not Granger Cause D(PSEI)	34	4.21521	0.0486
D(PSEI) does not Granger Cause D(STI)		6.31435	0.0174

Furthermore, before testing the regression model, the classical assumption test must be done. This is because the regression model to be used is OLS (Ordinary Least Square). Classical Assumption Test is used to provide the expected statistical value (best estimator, linear and unbiased) (Gujarati & Porter, 2015: 402). The classic assumption test results provide information, that data is normally distributed with a Prob value> 0.05 (see Attachment 2); the residual does not contain autocorrelation with the Prob.Chi Square value> 0.05 (see Attachment 3); between X variables there is no multicollinearity with a Centered VIF value <10 (see Attachment 4) and the residual does not contain heterocedasticity with zero Prob.Chi Square> 0.05 (see Attachment 5).

Table 10 will show the estimation results of the VAR model at the level of difference at Lag 1. The estimation of the VAR model is used to determine the magnitude of the movement of the dependent variable in each change in the independent variable. In the VAR model estimation test, the average Indonesian CSPI variable is the dependent variable, while the average CSPI variable of the People's Republic of Tiongkok, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam becomes independent variables. Results Table 10 shows that the average CSPI of the SSEC, LSXC, PSEi, STI, SET and VNI did not significantly influence the average CSPI JCI. Only the average CSPI KLCI variable has a significant effect on the average CSPI JCI. The VAR regression model that can be compiled is as follows:

$$D(JCI(-1)) = 12.72419 + 0{,}019164 * D(SSEC(-1)) + 0{,}005268 * D(LSXC(-1)) + 1.944019 * D(KLCI(-1)) + 0{,}153087 * D(PSEi(-1)) - 0{,}080118 * D(STI(-1)) + 0{,}632867 * D(SET(-1)) + 0{,}632728 * D(VNI(-1))$$

Table 10. Estimated VAR Model Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.72419	18.59253	0.684371	0.4998
D(SSEC(-1))	0.019164	0.068835	0.278408	0.7829
D(LSXC(-1))	0.005268	0.460797	0.011432	0.9910
D(KLCI(-1))	1.944019	0.565782	3.435986	0.0020
D(PSEI(-1))	0.153087	0.098712	1.550837	0.1330
D(STI(-1))	-0.080118	0.126669	-0.632500	0.5326
D(SET(-1))	0.632867	0.544212	1.162906	0.2554
R-squared	0.655294	Mean dependent var		23.55412
Adjusted R-squared	0.562488	S.D. dependent var		140.3908
S.E. of regression	92.86103	Akaike info criterion		12.10241
Sum squared resid	224202.5	Schwarz criterion		12.46155
Log likelihood	-197.7410	Hannan-Quinn criter.		12.22489
F-statistic	7.060932	Durbin-Watson stat		1.285879
Prob(F-statistic)	0.000093			

Figure 2-9 (see Attachment 6) will show the results of the Impulse Response Function test. The Impulse Response Function test is used to check the response of a shock. Results Figure 2 shows that all the average CSPI variables of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam have not left a permanent influence from the shock of economic slowdown in the People's Republic of Tiongkok.

Table 11 will show the results of the Variance Decomposition test. The Variance Decomposition test is used to determine the movement proportion in each variable itself compared to other variables as a result of shock. Results Table 11 shows that the shock in the People's Republic of Tiongkok, in the first period will affect the average CSPI SSEC by 100%, then period 2 shock will affect the average CSPI SSEC by 83.78%, the average CSPI JCI by 1.36%, the average CSPI LSXC by 10.32%, the average CSPI KLCI by 1.77%, the average CSPI PSEi by 2.24%, the average CSPI STI by 0.03%, the average CSPI SET by 0.02 % and the average CSPI VNI by 0.48%.

Table 11. Variance Decomposition Test Results

VD of SSEC Period	D(SSEC)	D(JCI)	D(LSXC)	D(KLCI)	D(PSEi)	D(STI)	D(SET)	D(VNI)
1	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	83.78	1.36	10.32	1.77	2.24	0.03	0.02	0.48
3	71.19	5.34	9.95	1.69	1.95	1.43	0.27	8.17
4	63.47	5.52	10.36	1.60	2.98	1.32	0.99	13.77
5	62.85	5.34	9.97	1.73	3.78	2.18	0.95	13.19
6	57.87	5.52	10.23	1.71	5.07	2.37	1.09	16.14
7	54.95	5.41	11.47	2.03	5.09	2.69	1.05	17.31
8	54.23	5.24	11.44	2.21	5.34	3.60	1.15	16.77
9	52.89	5.09	11.35	2.15	6.56	3.60	1.30	17.05
10	51.71	4.98	11.82	2.30	6.94	3.72	1.28	17.26

Based on the results of the analysis carried out using the Vector Autoregression (VAR) method, the results obtained to answer four hypotheses. The first hypothesis was formulated to find empirical evidence when economic slowdown in the People's Republic of Tiongkok affects the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. Tables 7 and 8 show, when there is economic slowdown in the People's Republic of Tiongkok, the average CSPI SSEC was influenced by the average CSPI LSXC; the average CSPI KLCI was influenced by the average CSPI JCI and the average CSPI KLCI; the average CSPI PSEi was influenced by the average CSPI LSXC and the average CSPI PSEi; the average CSPI STI was influenced by the average CSPI STI and the average VNI; The average CSPI SET was influenced by the average CSPI KLCI. These results indicate that economic slowdown in the People's Republic of Tiongkok does not affect the CSPI average of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. This is because, only the average CSPI LSXC variable is influenced by the average CSPI SSEC. Thus, it can be concluded that Ha1 is rejected, which means that economic slowdown in the People's Republic of Tiongkok, does not affect the CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. These results support research from (Tandeilin, 1997; Thobarry, 2009; Ikrima & Muharam, 2015) which provides results of research that GDP news does not affect the CSPI.

The second hypothesis is formulated to find empirical evidence of cointegration relations in the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam during economic slowdown in the People's Republic of Tiongkok using the VAR cointegration test. Tables 5 and 6 show that at r = 0 Trace Statistic and Max Eigen Statistics which have values greater than Critical values with a significance of 5%. That is, in the event of economic slowdown in the People's Republic of Tiongkok, there is a long-term relationship to the CSPI average of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. So, it can be concluded that Ha2 is accepted, which means there is a cointegration relationship on the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam when there is economic slowdown in

the People's Republic of Tiongkok. These results support research from research (Kizys & Pierdzioch, 2011; Nurhayati, 2012; Puspitasari et al, 2015; Santosa, 2012; Sofa, 2015) that provide research results that some countries occur cointegration.

The third hypothesis was formulated to find empirical evidence that the average Indonesian CSPI was influenced by the average CSPI of the People's Republic of Tiongkok, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam during economic slowdown in the People's Republic of Tiongkok using analysis of the VAR regression model. Table 10 shows that each of the average CSPI SSEC, LSXC, PSEi, STI, SET and VNI does not have a significant effect on the average CSPI JCI, only the the average CSPI KLCI has a significant effect on the average CSPI JCI. So, it can be concluded that Ha3 is rejected, which means that the average CSPI Indonesian is not affected by the average CSPI of the People's Republic of Tiongkok, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam during economic slowdown in the People's Republic of Tiongkok. This statement is supported by the results of the research (Mansur, 2002; Christa & Pratomo, 2010; Tarigan et al., 2015 Kowanda et al., 2017; Safiroh et al., 2018;) which provide the results of research that not all influential Foreign Stock Price Indices against the Indonesian CSPI.

The fourth hypothesis is formulated to find empirical evidence that a country is affected by a shock, contagion effects will occur to other countries with the analysis of Variance Decomposition. Table 11 shows that when the average CSPI SSEC shock, the impact will spread to other countries with different proportions of influence. So, it can be concluded that Ha4 is accepted, which means that there is a potential contagion effect on the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam in the event of economic slowdown in the People's Republic of Tiongkok. These results support the research (Trihadmini, 2011; Kenourgios et al., 2011; Lee, 2012; Sofa, 2015; Ikrima & Muharam, 2015) which provide research results that contagion effects occur in several countries as a result of the shock caused by other countries .

CONCLUSIONS AND RECOMMENDATIONS

This study aims to find empirical evidence of the relationship of co-integration and contagion effect on the average CSPI of the People's

Republic of Tiongkok and ASEAN during economic slowdown in the People's Republic of Tiongkok in 2015-2017.

The results of this study found, first, economic slowdown in the People's Republic of Tiongkok had no effect on the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. Second, the economic slowdown in the People's Republic of Tiongkok has an impact on the occurrence of cointegration relations on the average CSPI in the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. Third, the average CSPI Indonesian is not affected by the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam at an economic slowdown in the People's Republic of Tiongkok. Fourth, there is a contagion effect on the average CSPI of the People's Republic of Tiongkok, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam.

The limitations of this study are using the monthly average JCI, so the test results do not answer all hypotheses as expected. In addition, the period used is only in the event of economic slowdown, namely in 2015-2017.

Suggestions for future researchers so that the data used for daily CSPI with a longer period.

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