Stock Market Co-Integration Evidence from Indonesia, Malaysia, South Korea, Hong Kong, and The US Stock Market

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ABSTRAK

Liberalisasi keuangan yang dilakukan oleh banyak Negara Asia telah memprakarsai pertumbuhan yang signifikan dalam transaksi keuangan dan aliran dana di pasar keuangan internasional sehingga meningkatkan hubungan antara pasar saham berkembang dengan pasar saham maju. 'Kecelakaan' 2008 di pasar saham AS telah menjadi penyebab kemerosotan di banyak pasar saham di Asia bersama dengan di luar Asia. Namun, hubungan ini menunjukkan bahwa diversifikasi internasional tidak dapat diterapkan di antara negara-negara ini. Penelitian ini bertujuan untuk menyelidiki hubungan dinamis pasar saham di Indonesia, Malaysia, Korea Selatan, Hong Kong, dan Amerika Serikat dengan menerapkan pendekatan ko-integrasi selama periode krisis dan setelah krisis ekonomi global tahun 2008. Hasil empiris menunjukkan bahwa Indonesia, Malaysia, Korea Selatan, Hong Kong, dan pasar saham AS saling terintegrasi selama dan setelah krisis. Temuan empiris ini memiliki implikasi penting bagi pengelolaan portofolio internasional dalam pembentukan portofolio saham di pasar saham Indonesia, Malaysia, Korea Selatan, Hong Kong, dan AS. Hasil penelitian ini menunjukkan bahwa investor tidak dapat memperoleh manfaat jika melakukan diversifikasi internasional di antara lima bursa efek. Namun, dalam jangka pendek dimungkinkan untuk mendapatkan pengembalian yang berlebih.

Kata Kunci: Integrasi Pasar Saham, Johansen Co-Integration Test, Krisis Ekonomi Global, Pasar Saham Asia

ABSTRACT

Financial liberalization conducted by many Asian countries has initiated significant growth in financial transactions and flow of funds in International financial markets hence increases the linkage between emerging stock markets with developed stock markets. The 2008 crash in the US stock markets has been the cause of the downslide in many stock markets in Asia along with outside Asia. However, this linkage indicates that international diversification cannot be implemented among these countries. This research aims to investigate the dynamic linkage of stock markets in Indonesia, Malaysia, South Korea, Hong Kong, and The US by applying the co-integration approach during the period of crisis and after the global economy crisis of 2008. Empirical result shows that Indonesia, Malaysia, South Korea, Hong Kong, and the US stock markets are co-integrated during and after the crisis. This empirical finding has important implications for the management of an international portfolio in the establishment of a stock portfolio in the Indonesian, Malaysian, South Korean, Hong Kong and the US stock markets. The result of this study shows that investors cannot get benefit if doing international diversification among the five stock exchanges. However, in the short term it is possible to obtain an excess return.

***Key words**: Stock Market Integration, Johansen Co-Integration Test, Global Economic Crisis, Asian Stock Market*

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I. INTRODUCTION

In late decade governments and business organizations are understanding the significance of capital markets in monetary development of a country. Long term debt and equity securities are traded in a stock market. In addition, in stock market Governments and individual raise funds against long term investment. The capital market is proven to contribute as much as 12% on Indonesia's economic growth in 2016. With the globalization and financial liberalization encouraging the number of foreign investors, whom also invest in Indonesian capital market and vice versa, investors also invest in a large amount. Not only in domestic market, but Investors also invest in various market of other countries, aiming to combine risks and return, commonly known as international diversification. However, financial liberalization also brings some negative impacts by integrating the financial system, resulting the domestic financial disturbance in one country which leads to a domino effect by disrupting other economics, that will inevitably cause a global catastrophe.

One of the crises that remains a highlight in the history of the global economy is the global economic crisis in 2008. During the time, the development of the crisis instantly spread to other continents, producing a global crisis as a result of the contagion effect in the midst of globally integrated financial system and rapid information distribution. The crisis preceded by the subprime mortgage crisis caused global stock markets to fall to the very bottom since September 2001 as experienced by some stock markets in Asia such as Indonesia, Malaysia, South Korea, and Hong Kong contributing to negative returns in times of crisis. Indonesia, saw a significant decrease in return presentation from 73.1% (2007) to -56.2% (2008) and rose again to 127.6% (2009), as did Malaysia with a shrinking percentage from 46.1 % (2007) to -41.2% and rose again to 52.1%, South Korea declining from 32.6% (2007) to -55.1% (2008) and rose again to 72.1% (2009), while Hong Kong 41.2% (2007) to -51.2% and rose again to 60.2%. So it can be concluded that there are correlations between one country and another.

In October 2008, the economic crisis caused by housing mortgage in US dropping the stock price in some major index in US. Industrial Average Dow Jones Index was closed down to 800 point in the same day. In Indonesia, the disturbance of capital and money markets had confirmed that the financial crisis had affected the Indonesian economy. As a result, in December IHSG was closed at 1335.4, declining from 2627.3 in 2008 along with the fall of market capitalization and a serious decline in market trading volume. Outflows of foreign shares, government securities, and SBI are still ongoing until December 2008. By the end of December 2008, foreign government securities listed in RP. 87,4 Billion. The downfall of IHSG, the price of government securities, and SBI have put pressure on domestic financial stability marked by the financial stability index that exceeded the maximum indicative threshold. In conclusion, the global economic crisis in 2008 was triggered by the crisis in America, and was very influential on the economy of Indonesia.

The above facts describe the relationship between stock markets in the world, that is the stock market in America with stock markets in Asia, especially in Indonesia. Supported by the development of Information Technology, the world's financial system has strengthened the financial integrity which also caused an effortless and rapid spread of financial crisis, followed by the destruction of economy. Therefore, this study would like to see whether there is a long-term relationship between the Indonesian stock market with the US stock market and the other three Asian markets such as Malaysia, South Korea and Hong

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Kong stock markets. These four countries are known to have economic cooperation with Indonesia.

This study uses time series data analysis that is, daily closing price on the composite index in each stock market. Although some recent papers have studied the dynamic relationships among Asian stock markets (see, for instance, Gilmore & McManus,2002 & Click and Plummer,2005) the main difference between them and ours is in the length of data. Using and collecting data from 2007 to 2017, this research reflects more factual situation, whilst some previous research might not use long term existing data.

The rest of paper is organized as follows. The next session provides a brief discussion of the relevant literature on co-integration studies and on linkage of market. Section 3 provides a description of the data used and methodology adopted in this study. Section 4 discusses the results, while section 5 concludes the paper and provides suggestions for future study.

II. THEORETICAL BASIS

Academicians, practitioners and decisions makers search for a model that can show linkages among stock markets specifically in emerging and developed market. Using the model, they were given better perspective on market movement. It allows them to maintain their investment properly. In addition, to diversify the group portfolio risks. In developing such a connected exemplary, the academicians and stock market researchers use the most popular method, namely co-integration analysis. The level of stock market integration influence the investors to get some opportunities to diversify the international portfolio. By doing an integration, investors were given chances to apportion capital sufficiently. As for the policymakers, regional integration benefits in expanding the investors base and range of financial products, in such a way to strengthen domestic capital markets in competing globally (Narayan et al.,2011). To limit the probability of asymetrics shocks, an integrated financial market also is useful to maintain the financial stability (Umutlu et al.,2010).

Introduced by Granger (1981), Engle & Granger (1987), and Granger & Hallman (1991), Co-integration Analysis shows regular stochastic tendencies in stock price time series data and is helpful to analyze long – run investment. Moreover, the analysis considers the integrated I (1) – I (0) (Christensen &Nielsen, 2003). In The bivariate case, If yt and xt are I (1) and hence nonstationary (unit root) processes, but there exists process et which is I (0) and fixed ß such that; yt = ß'xt + et, then xt and yt are defined as co-integrated. In such a way, nonstationary series shift together as a result of linear permutation of them is stationary and for this reason a regular speculative trend is shared. (See Herwany & Febrian, 2013).

To get a higher asset return, portfolio optimization based on integration is preferably used in application of co-integration analysis rather than using the correlation. (Johnson & Soenen, 2002; Narayan etal., 2014). Moreover, others investigate the kind of economic and financial conditions that can create the correlations between stock market without using the correlation technique. Meanwhile, volatility study – a study focusing on a lot of literature in volatility linkages – limits equity markets (Baele,2005; Hardouvelis et al, 2006; Chakrabarti, 2011).

Another important line of the empirical literature applies co-integration techniques for assessing the degree of long – run co movements between international equity markets, but

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the result are mixed and uncertain. (Gilmore & McManus,2002 ; Sharma &Thaker ,2015) obtain limited evidence of long run co–movements. While the above literature is incapable to find meaningful evidence to support the existence of long run co movements between International stock markets other studies have obtained paradoxical results Schahmurove (2006) examine the stock market co-integration between America and four emerging markets namely China, Brazil, Russia, and India showing the long dynamic relation between these countries.

Meanwhile, Click and Plummer (2005) find only one co-integrating vector among the ASEAN-5 stock markets, implying that even though the integration is incomplete, they are integrated in the economic sense. To validate the low integration between American and Asian markets , Aityan et al (2010), Harvey (1993), Sigh and Loh (2010) have revealed that Asian markets usually have low exposure to global factors and little integration with western economies.

The literature on the Southeast Asia stock markets linkages present mixed and unclear results. Several research studies have focused on the dynamic relationship of The US and four Asian Markets such as Indonesia, Malaysia, South Korea, and Hong Kong despite there are some studies that have examined the dynamic evolution of capital market integration in Asian Countries.

In addition to the developments between US and Asian Markets in trade and finance, it expected that the interpendence of their stock markets will show economic integration in the form of trade linkages and investment flows. However, In the context of crisis Herwany and Febrian (2013) reveals that there are only limited long – run advantages from cross – country portfolio diversification as stock prices adapt very slowly to the common trends despite the continuation of co-integration.

Especially around the high volatility period, economic policy makers must comprehend every knowledge on transmission of price movements in regional equity markets. To lessen the degree of financial crisis, appropriate policy may be created. Hence, a research on co-integration regional stock market is important. Complemented by co-integration approach, the correlation analysis is appropriate in making short term investment decisions, while co-integrating based strategies are required for long - term investment.

III. RESEARCH METHOD

This study uses daily closing price data of each composite index namely Indonesia - Jakarta Composite Index (JCI), Malaysia - FTSE Bursa Malaysia Kuala Lumpur Composite Index (FBMKLCI), South Korea - Korea SE Composite Index (KOSPI), Hong Kong - Hang Seng Composite Index (HSCI), and The US - Dow Jones Industrial Index (DJIA). This study divided into two sub - periods namely during - crisis period from 1 July 2007 to 31 December 2008 and post - crisis period from 1 January 2009 to 30 November 2017. The stock price index of each country is transformed into returns and expressed in domestic currency in order to reflect the actual domestic market reaction (Choudry,1994).

The research method was conducted by using Johansen method in two stages. The first stage is co-integration testing for five stock markets namely Indonesia, Malaysia, South Korea, Hong Kong, and US period during crisis and post crisis together with multivariate co-

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integration test technique. This technique is used to see whether in groups of index variables stock markets between countries have a long-term relationship between each other.

In the second phase of testing, the pairing of five Indonesian, Malaysian, South Korean, Hong Kong and US pre-crisis counterparts in the pre-crisis and post crisis period has a long-term relationship with the results of the bivariate test. It can also be seen which countries are the most dominant among the stock exchanges. The Johansen co-integration Test is used to estimate and test a number of co-integration relationships and the common stochastic trend between the vector components X t of the non-stationary variables including short-term and long-term dynamic differences. The Johansen procedure begins by stochastic variable in a vector (nx1), X t as the unstrict vector auto regression (VAR). The VAR model used in this research are:

$$X_t = A_1 X_{t-1} + A_2 X_{t-2} \ldots + A_p X_{t-p} + c + \varepsilon_t \ldots (1)$$

Where, $X_t = (X_{it} + X_{2t} + X_{3t} + X_{4t} + X_{5t})$

Is vector (5x1) stock market indices of Indonesia, Malaysia, South Korea, Hong Kong, and US. A1 is a matrix parameter (5x5), c is a constant vector (5x1), εt is a constant vector (5x1) random error terms with zero mean and constant variant, and p is the lag-length. Furthermore, Johansen (1988), Johansen and Juselius (1990), system equations (1) can be rewritten in the first form of difference:

$$\Delta Xt = \Gamma i \Delta xt - i + \Gamma 2 \Delta xt - 2 + \cdots + \Gamma_{p-1} \Delta xt_{-p-1} + \Pi x_{t-p} + \varepsilon_t$$

$$= \sum_{i-1}^{p-1} \Gamma_i \Delta x_{i-1} + \Pi x_{t-p} + \varepsilon_t (2)$$

Where:

$$\Delta x_t = X_{i-} X_{t-i,} II_i = [1 - \sum_{i-t}^{p-1} A_i] , [1 - \sum_{i-1}^{p} Ai]$$

is the identity matrix (5x5), ΠXt-p contains information relating to the balance of long-term relationships among variables Xt. The existence of long-term relationships between the composite stock price indexes of Indonesia, Malaysia, South Korea, Hong Kong, and America is represented by the rank matrix, r, where r is 0 <r <n. Two α and β matrices with dimensions (nxr) such that αβ '=.

The β matrix contains the co-integration vector r and has the property that β 'Xt is stationary. Á is the matrix of the error correction presentation which measures the speed of adjustment in Xt. As a model evaluation, two statistic tests can be used to hypothesis the presence or absence of co integration vector r. First, the statistical test of the likelihood ratio (LR) or trace test for the hypothesis that there are at most different co-integration vectors with a common alternative, with the following formulation:

$$\lambda - trace\ (r) = T \sum_{i=r+1}^{n} \ln(1 - \lambda i) (3)$$

Where λi's is the smallest n-r canonical correlation between residual Xt-p and Δ Xt series, corrected for the lagged differences effect of X process, and T is the number of observations. Alternatively, the maximum eigenvalue test can be used to compare the co-integration-null vector hypothesis (r + 1). The LR statistic test for the hypothesis is given by:

$$\lambda - trace\ (r, r+1) = -T \ln(1 + \lambda i)$$

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The test for linear restriction on β discloses information relating to the economic structure relationships underlying the long-term model. We use the LR test developed by Johansen (1991) to test this economic restriction. The LR statistic test is as follows:

$$\text{LR: } T\Sigma[\ln(1-\lambda t) - \ln(1-\lambda)] \sim \chi^2(df)$$

df = r (n-s) is the number of degrees of freedom λ is the eigen value based eigenvectors
the restriction and λt are eigenvalue based on unrestricted eigenvectors.

IV. DISCUSSION

Table 4.1 shows the correlation matrix between the composite stock indices in the stock markets to five countries during the period during crisis. The correlation coefficient among the five stock exchanges gives a positive majority result. there are only three correlations that show negative results that are correlation between South Korean stock exchange with Indonesia stock exchange, the US stock exchange with Indonesia stock exchange and Malaysia stock exchange and South Korea stock exchange. The highest correlation is shown between The US stock exchange and South Korea stock exchange which is 0,197 and the lowest correlation shown between US stock exchange and Hong Kong stock exchange is 0,010.

Table 4.1. Correlation Matrix of Returns on The Five Indices During Crisis (1 July 2007 – 31 December 2008)

	Indonesia - Crisis	**Malaysia - Crisis**	**Hong Kong - Crisis**	**South Korea - Crisis**	**The US - Crisis**
Indonesia - Crisis	**1.000**	0.067	0.137	-0.072	-0.050
Malaysia - Crisis	0.067	**1.000**	0.015	-0.107	0.036
Hong Kong - Crisis	0.137	0.016	**1.000**	0.016	0.010
South Korea - Crisis	-0.072	-0.107	0.016	**1.000**	0.197
The US - Crisis	-0.049	0.036	**0.010**	**0.199**	**1.000**

Source: Processed Data

Table 4.2 shows the correlation matrix among the five stock exchanges in the post-crisis period gives a positive majority result, there are only two correlation showing negative results that are correlation between South Korea stock exchange with Indonesia stock market and South Korea stock exchange with Malaysia stock exchange. The highest correlation shown between the Hong Kong stock exchange with Malaysia stock exchange which is 0.140 and the lowest correlation is shown The US stock exchange with Malaysia stock exchange which is 0,013.

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Table 4.2. Correlation Matrix of Returns on The Five Indices Post Crisis (1 Juli 2007 – 31 December 2008)

	Indonesia – Post Crisis	Malaysia – Post Crisis	Hong Kong – Post Crisis	South Korea – Post Crisis	The US – Post Crisis
Indonesia – Post Crisis	**1.000**	0.031	0.054	-0.027	0.058
Malaysia – Post Crisis	0.031	**1.000**	0.139	-0.022	0.013
Hong Kong – Post Crisis	0.054	**0.140**	**1.000**	0.052	0.072
South Korea – Post Crisis	-0.027	-0.022	0.053	**1.000**	0.062
The US – Post Crisis	0.058	**0.013**	0.072	0.061	**1.000**

Source: Processed Data

The very early phase in the estimation process is deciding the order of integration of the individual price index series in natural log levels. The log of the Indices denoted as JCI, FBMKLCI, KOSPI, HSCI, and DJIA are tested for unit roots using the augmented Dickey – Fuller (ADF) (1979) test. The result is indicated by AIC (Akaike Information Criterion). The p values used for the tests are the Mac Kinnon (1996) one – sided p values. The test results as can be seen on table 4.3 indicated that the null hypothesis, the price in log levels does not contains a unit root, can be rejected for each of five price series whether in the period of during crisis or post crisis. No further tests are performed, since each of the series is found to be stationary in log levels.

Table 4.3.
Results of Augmented Dickey Fuller (ADF) Unit Root Test on Price Indices

Index	Period	ADF Statistic Value	P. Value	MacKinnon's Critical Value			Conclusion
				1%	5%	10%	
^JCI	During crisis	-15.834	0.000	-3.450	-2.869	-2.571	Stationer
	Post	-29.321	0.000	-3.433	-2.863	-2.567	Stationer
^FBMKLCI	During	-17.932	0.000	-3.448	-2.869	-2.571	Stationer
	Post	-41.830	0.000	-3.433	-2.862	-2.567	Stationer
^KOSPI	During	-18.744	0.000	-3.448	-2.869	-2.571	Stationer
	Post	-46.553	0.000	-3.433	-2.863	-2.567	Stationer
^HSCI	During	-20.740	0.000	-3.448	-2.869	-2.571	Stationer
	Post	-45.758	0.000	-3.433	-2.863	-2.568	Stationer
^DJIA	During	-18.122	0.000	-3.447	-2.869	-2.570	Stationer
	Post	-50.760	0.000	-3.433	-2.863	-2.567	Stationer

Source: Processed Data

From the stationery test data in each level of each country during and after the crisis probability value is smaller than alpha 5% or 0,05. Thus, each data for each country is the stationer data.

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The second phase is a co-integration test in pairs (bivariate / pairwise test) between the fifth market of the stock market. Bivariate testing is intended to obtain a clearer picture of the relationship between stock markets of two countries before testing the co-integration relationship on a multivariate basis. Bivariate co-integration testing is conducted on ten possible pair of Asian stock market and The US stock market.

If two stock markets are co-integrated, then the stock price in one market can be estimated from other markets. Each stock market co-integration testing is based on the lag calculated using the Akaike Information Criterion (AIC). Co-integration test results paired (bivariate test) between the stock markets to five research object countries during the period of during crisis and post crisis obtained results in Table 4.4 (During Crisis & Post Crisis).

Table 4.4
Results of Bivariate Co-Integration Test Between Countries During Crisis and Post Crisis

	Period	Eigen Value	Trace Statistic	0.05 Critical Value
INDONESIA - MALAYSIA	During	0.375	277.467	15.495
	Post Crisis	0.326	1626.026	15.495
INDONESIA - HONGKONG	During Crisis	0.350	270.717	15.495
	Post Crisis	0.345	1753.564	15.495
INDONESIA - SOUTH KOREA	During Crisis	0.355	259.033	15.495
	Post Crisis	0.360	1793.868	15.495
INDONESIA - THE US	During Crisis	0.476	347.538	15.495
	Post Crisis	0.340	1747.341	15.495
MALAYSIA- HONGKONG	During Crisis	0.443	334.335	15.495
	Post Crisis	0.392	1774.625	15.495
MALAYSIA- SOUTH KOREA	During Crisis	0.413	306.0179	15.495
	Post Crisis	0.356	1712.721	15.495
MALAYSIA- THE US	During Crisis	0.497	393.340	15.495
	Post Crisis	0.347	1670.004	15.495
HONGKONG- SOUTH KOREA	During Crisis	0.513	379.949	15.495
	Post Crisis	0.350	1831.063	15.495
HONGKONG- THE US	During Crisis	0.485	386.139	15.495
	Post Crisis	0.348	1790.635	15.495
SOUTH KOREA- THE US	During Crisis	0.485	380.366	15.495
	Post Crisis	0.386	1864.536	15.495

Source: Processed Data

From table 4.4 above, the result of estimation of trace statistic and maximum eigen value is greater than critical at the 5% significance level, hence indicating that there is co-integration in ten pairs of stock exchanges both during crisis and post crisis at 5% significance level. There was one linear combination of the ten prices series that forced these markets to have long – term equilibrium relationship even though the markets might wander

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away from each other in the short run.) The message for long term international investors is that would not matter, in terms of portfolio returns, whether investors in the observed markets held a fully diversified portfolio of stocks contained in all of the ten stock markets.

The final phase is the multivariate co-integration test. This test is to see whether or not balance between variables is done by comparing the estimated value of trace statistics and maximum eigen value with critical value with 5% of significance level. If the estimated trace statistics value and maximum eigen value are greater than the critical at the 5% significance level, then it shows that there is a co – integration vector at the 5% significance level. However, if the estimated value of trace statistic and maximum eigen value is smaller than its critical value it can be said there is no co-integration vector.

Table 4.5
Results of Multivariate Co- Integration Test Among Countries During Crisis

	Eigen Value	Trace Statistic	0.05 Critical Value
None *	0.517	927.245	69.819
At most 1 *	0.508	665.869	47.857
At most 2 *	0.433	411.134	29.797
At most 3 *	0.264	207.354	15.495
At most 4 *	0.238	97.501	3.841

Source: Processed Data

From table 4.5 above, the results of estimation of trace statistic and maximum eigen value is greater than critical at 5% significance level, hence indicating that there is co-integration vector during crisis at 5% significance level. This shows the long-term equilibrium in Indonesia, Malaysia, South Korea, Hong Kong and The US stock exchange during the period crisis of 2008. This means that there is indeed a long-term relationship between The US stock exchange and Asian stock exchange. From this test also can be concluded that the 2008 economic crisis in the US affect the stock market in Indonesia, Malaysia, South Korea and Hong Kong because of the long-term relationship.

Table 4.6
Results of Multivariate Co-Integration Test Among Countries Post Crisis

	Eigen Value	Trace Statistic	0.05 Critical Value
None *	0.398	4515.914	69.818
At most 1 *	0.385	3415.092	47.856
At most 2 *	0.333	2360.241	29.797
At most 3 *	0.312	1481.354	15.494
At most 4 *	0.265	669.071	3.841

Source : Processed Data

From table 4.6 above, the result of estimation of trace statistic and maximum eigen value is greater than critical at the 5% significance level, hence indicating that there is vector

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post crisis co-integration at 5% significance level. This is aimed at long-term equilibrium in Indonesian stock exchange, Malaysia, South Korea, Hong Kong and The US in the after crisis period 2008. These empirical findings give different results to the period when the global economic crisis in 2008 where there is an increase where the value of trace statistics in the period after the crisis is greater. This empirical finding is in line with Aityan et al (2010), Harvey (1993), Sigh and Loh (2010) which indicated that Asian markets have low exposure to global factors and little integration with western economies.

V. CONCLUSION

This study aims to investigate the dynamic linkage of stock markets in Asian countries such as Indonesia, Malaysia, South Korea, Hong Kong, and The US stock markets. This study applies a co-integration approach to detect and identify the dynamic relationship between Asian and The US stock markets during the period of crisis and after the global economic crisis of 2008.

Empirical results show that Indonesia, Malaysia, South Korea, Hong Kong and The US stock markets are based on good co-integration test bivariate and multivariate shows there is a long-term balance between the five stock markets. For testing bivariate to ten pairs of stock exchanges namely Indonesia - Malaysia, Indonesia - Hong Kong, Indonesia - US, Malaysia - Hong Kong, Malaysia - South Korea, Malaysia - US, Hong Kong - South Korea, Hong Kong - US and South Korea - US both in the period during crisis and after crisis has a relationship or co-integrated.

For multivariate co-integration testing the results show that the five stock exchanges have long-term relationships in both the crisis period and after the crisis. This co-integration analysis of the Asian and US stock markets has important implications for the management of an international portfolio in the establishment of a stock portfolio in the Indonesian, Malaysian, South Korean, Hong Kong and US stock markets. The result of this study shows that investors cannot get benefit if doing international diversification among the five stock exchanges. However, in the short term it is possible to obtain an excess return.

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