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The Relationship between the Movements of Capital Markets in Developed Economies and Their Emerging Market Counterparts in The Asian Pacific Region

Noor Azlinna Azizan* and Zamri Ahmad

This research revisits at the relationship between the movements of capital markets in developed economies and their emerging market counterparts in the Asian Pacific region using market indices of the American, British, Malaysian, Singaporean, Mainland Chinese, Hong Kong Special Administrative Region (SAR), Indian, Japanese and Australian markets for the periods 1997 to 2007. The Johansen's Cointegration Test, and Vector Correction Model Test were used to determine the long term relationship between the markets. This study finds that the Asian markets are very much influenced by the events in the United States rather than other developed markets. Of all the markets being surveyed, The South East Asian markets are the most sensitive towards events in their own region and regions outside themselves. Mainland China in the long run is not affected by events outside themselves.

Keywords: *capital markets, Asian Pacific, cointegrations, vector error correction, long term relationship.*

Introduction

The relationship between the movements of capital markets in developed economies and their emerging market counterparts has been studied by many scholars especially in the West. Many studies center on the wisdom of market cointegration investments into emerging markets for example studies made by Platt (1998) and Glenn and Pinto (1994). Although this issue of market cointegration has been investigated by many researchers, the ever changing and connected world economy has resulted in researchers needing to revisit this topic from time to time. The ease of investing in another market through the internet, international fund managers opening their branches in new markets and the ease of getting information about investing in a foreign market are new developments to the science of investment thus prompting a revisit to the topic of market cointegration.

Cointegration as defined by Engle and Granger (1987) is *"a long run equilibrium relationship between variables."* In simple terms in this study, cointegration is the

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relationship between one market and another market. The phenomenon of the cointegration of markets came about due to cross listings of companies in different bourses. Sony of Japan for example is listed in the Tokyo Stock Exchange as well as in the New York Stock Exchange as an American Depository Receipt. Lang et al. (2002) noted that firms that cross-list on a more transparent bourse are valued more highly due to important changes that occur in the information environment of firms around cross-listing and that these changes are rewarded with higher valuations by the market. Investor protection and agency problems have been argued to be important to the cross-listing decision.

The main objectives of this study are to find out:

a. Whether there is a relationship between the movements of the capital market in developed economies and their emerging counterparts especially those in the Asia Pacific region.
b. Whether there is a relationship between the movement of markets in one sub region and with another in a different sub region
c. Whether there is a relationship between the movement of one established market in one sub region and another market in the same sub region

By understanding the relationship between the local market and the international market, investors avert risk on their current portfolio. The first tenet of the portfolio theory is that investors avoid risk when investing. Movements in a foreign bourse become a signal for the local investor to relook their current investments and protect their portfolio from losses.

Literature Review

Among the researchers interested to study market interactions in Asia are, Abdul Ghani (1994) investigated the effects of macroeconomic variables on stock prices in the USA, United Kingdom, Germany (that time West Germany), France, Norway, Japan, Singapore, Malaysia, Australia and South Africa. The macro-economic variables used in this study represent the major economic activities in each of the countries surveyed.

In his study, market returns and economic variables were divided into two sub periods i.e. January 1980 to December 1983 and January 1984 to December 1987. Different economic variable factors and market return factors were placed in the different periods surveyed, economic variables were included as part of the analysis to look at the cointegration of markets. Other study by Hung and Tong (1994) looks at the short-run and long-run movements of stock prices, capital flows and real interest rates in pre-handover Hong Kong. They noted that stock prices, capital flows and real interest rates move together in the long run thus making capital flows and interest rates a good long term predictor of the capital market in Hong Kong

Phylaktis (1997) used the approach of studying the movements of real interest rate when looking at the co-integration of the Asia Pacific capital markets between the periods 1980 to 1993. She used the cointegration and the error correction models and drew inferences on the degree of capital market integration by looking at the speed of adjustment of real interest rates following a shock. She found that there had been an increase in capital market integration with both the United States and Japan during the 1980s. Except for Malaysia, Japan has not overtaken the United States in dominating the financial markets of these countries. Capital market integration is found to be greater in Singapore, Hong Kong and the Republic

of China. Surprisingly the researcher found that Japan has the lowest level of cointegration with the United States.

Leong and Felmingham (2003) studied the degree of interdependence among the share markets of the five more developed economies in the East Asian region mainly Japan, Singapore, Hong Kong, South Korea and the Republic of China. They chose those markets as the five developed economy share markets provide a significant channel for Foreign Direct Investment and portfolio investment to the emerging countries of the Asia Pacific region. The combination of the Hong Kong, Republic of China, Japan and Singapore accounted for 83% of Mainland China's inward Foreign Direct Investment between 1979 and 1993.

Bachman et. at. (1996) examined the cointegration properties of the stock prices of the G-7 countries i.e. Canada, France, West Germany, Italy, Japan, the United Kingdom and the United States to determine the common trend in stock prices for the periods January 1970 to February 1989. The hypotheses tested included technological change, trade liberalization, and financial deregulation. They found that none of the three macroeconomic hypotheses mentioned are consistent with all tests.

Where as, Caporale et. al. (2002) noted that there is a connection between interest rates and the stock market. Pre-Asian Crisis stock prices lead positively interest rates in Indonesia and Thailand while behaving the opposite manner in Japan and South Korea. Manning (2002) tried to proof that gradual cointegration existed between the different Asian bourses through time. Manning analyzed samples comprising of weekly and quarterly information on equity indices and US dollar series i.e. the stock index of the country in question multiplied by the spot US dollar exchange rate, for the US, Hong Kong, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Republic Of China and Thailand bourses over the period January 1988 to February 1999. Manning found very little dynamics of convergence between the bourses signaling the interdependence of these markets.

Other study by Durand et.al. (2001) looked at the market indices, interest rates and spot cross exchange rates and their relationship between Asian Pacific countries i.e. Australia Hong Kong, South Korea, Malaysia, Singapore, Taiwan and Thailand with the markets in the US and Japan. The researchers noted that the American markets influenced all the markets surveyed but Japan only influenced Hong Kong, Malaysia, Singapore and Thailand.

The interaction between markets is studied by Roope, and Zurbreugg (2002), They looked at the connection between the intra-day price discovery process between the Singapore Exchange and the Taiwan Futures Exchange. The dynamic flow of information and price discovery between these exchanges show that futures prices interact considerably with each other. However, the more established Singapore Exchange dominates price discovery for Taiwan futures.

Finally, Tuluca et. al. (2003) found that the greater volatility between the Asian markets and world markets after the Asian Financial Crisis due to informational effects of the markets. News about earnings creates volatility between different correlated markets. However with this greater cointegration of markets the benefits of international portfolio diversification is lessened.

As a summary we found that various researchers have shown the evolution of the Asian and the developed capital markets from having no or lack of cointegration in the 1980s to having some level of cointegration in the era during or after the Asian Financial Crisis. However the levels

of cointegration vary from country to country and from region to region.

Methodology

Data

The data set consists of daily stock indices between 1 July 1997 and 31 December 2003 for the following markets:

a. *Developed markets* (Australia and Japan will be known as Developed Asia Pacific markets in this study.)
   United States of America¸ Dow Jones Industrial Average (DJIA), Australia ¸All Ordinaries Index), Japan ¸Nikkei 225), United Kingdom¸ Financial Times 100 (FTSE).
b. *Asian Pacific* (Dragon) markets and India (excluding Japan)
   Representing markets in North Asia
   China (Shenzhen B Shares Index), Hong Kong (Hang Seng Index)
   Representing markets in South Asia
   India SENSEX (BSE))
   Representing markets in South East Asia-Malaysia (KLCI) and Singapore (STI)

Data collected from this survey will be analyzed using E-Views. As this survey looks at the cointegration between the various indices over time, time series analysis is most suited for this purpose. We shall follow the method of dividing data similar with the one used earlier by Ong et. al. (2003).

For the short term analysis, the data will be divided as follows:

a) Set 1: 1 July 1997 to 31 December 1999
   This is the period just after the currency crisis.
b) Set 2:1 January 2000 to 31 December 2002
   This is the period where the technology bubble and the events of September 11 occurred.
c) Set 3:1 January 2003 to 31 December 2007
   This is the period where the corrective action against the problems of the currency crisis and the technology bubble were made. For the long term analysis, the data will range from 1 July 1997 to 31 December 2007.

Four tests will be used in this study

a) The Augmented Dickey Fuller Test
b) Johansen's Cointegration Test
c) Vector Error Correction Model Test
d) Granger Causality Test

Augmented Dickey Fuller Test (ADF)

The Augmented Dickey Fuller test is to identify whether the time series is stationary or not. Stationary data means the mean of the time series is stationary throughout the series and vice-versa. Our data shows that for all the periods the t-statistics are significant at 5% level. This means our data is non-stationary and need to be differentiated once to make it stationary. The results are summarized below in Table 1. This result is expected since stock indices are usually non-stationary.

Johansen's Cointegration Test (1991,1995)

To determine whether two non-stationary series are cointegrated or not and if they are, in identifying the long-run

Table 1. T Test for Augmented Dickey Fuller Test

DJIA	-2.304413
FTSE	-1.263519
ASX	-1.962631
NIK225	-1.592758
HANGSENG	-1.997054
SZSB	-1.147466
KLSE	-2.916045
STI	-1.998385
BSE	-0.963063

equilibrium, the Johansen's Cointegration test is applied to test the restrictions on the unrestricted Vector Autoregression (VAR) involving the series. The 95% confidence level is used as a benchmark in this study. The pairs are cointegrated if the likelihood ratio is above the critical value.

The hypotheses are as follows:

H0 : r =0, i.e. zero cointegration
H1 : r ≥ 1 i.e. pairs showing at least one cointegration

r representing cointegration

In this test the likelihood ratio must be more than the critical value i.e. rejecting the null hypothesis showing in that pair there is a least one cointegrating factor. Pairs marked CO are pairs that are cointegrated i.e. the pairs below shown a higher likelihood ratio as compared to the critical value.

Developed Market and Asian Pacific Market

All the pairs surveyed in the following categories are cointegrated i.e. all the pairs below shown a higher likelihood ratio (LR) as compared to the critical value (CV).

a) DJIA – ASX
(LR=24.67993,CV= 15.4100 at lag 3)
b) Hang Seng – DJIA
(LR=17.3698,CV= 15.4100 at lag 1)
c) KLSE – DJIA
(LR=26.1753,CV= 15.4100 at lag 1)
d) Nikkei-FTSE
(LR= 17.3713,CV=15.4100 at lag 1)

Relationship between Different Sub Regions in the Asia Pacific Region

All the pairs surveyed in the following categories are cointegrated i.e. all the pairs below show a higher likelihood ratio as compared to the critical value.

a) Australasia-South East Asia
(e.g. KLSE-ASX, LR=22.7826 ,CV= 15.4100 at lag 1)
b) North Asia-South East Asia
(e.g. KLSE-Hang Seng, LR=17.9658 ,CV=15.4100 at lag 1)

Relationship between Markets in the Same Sub Region

Only the South East Asia market is cointegrated when testing for the long run cointegration of members in the same sub region in the Asia Pacific region i.e. Malaysia and Singapore is one pair showing a higher likelihood ratio as compared to the critical value.

The Issue of Proximity

We classified the relationship between the movement of one capital market in a developed economy and one emerging market counterpart in the Asia Pacific Region as "far", the movements of one market in one Asia Pacific sub region with one other emerging market in another Asia Pacific sub region as "medium" and the relationship between the movements of one capital market in an Asia Pacific sub region with another in the same sub region as "near" and connected the issue of proximity with the issue of market cointegration.

From the results in Tables 3 to 4 (on page 109 and 110) we will note the level of cointegration rises with the level of proximity. At lag 1, all pairs which are "near" i.e. in the same sub region as cointegrated. Only 81% of the pairs which are "medium" i.e. one market in one Asia Pacific sub region with one other emerging market in another Asia Pacific sub region are cointegrated. Only pairs with the United States which are in the "far" category i.e. one capital market in a developed economy outside the Asia Pacific region and one emerging market counterpart in the Asia Pacific Region cointegrate.

Table 2. Long Run Cointegration of Developed and Developing Markets

1997 to 2003	Lag 1	Lag 2	Lag 3	Lag 4	Lag 5	Lag 6
	Critical Value	Critical Value	Critical Value	Critical Value	Critical Value	Critical Value
Developed -Asian Pacific	Variance	Variance	Variance	Variance	Variance	Variance
DJIA - ASX		CO	CO	CO	CO	CO
DJIA - ASX	CO	CO	CO	CO	CO	CO
HANGSENG - DJIA	CO	CO	CO	CO	CO	CO
KLSE - DJIA	CO	CO	CO	CO	CO	CO
KLSE - DJIA	CO	CO	CO	CO	CO	CO
STI - DJIA	CO	CO	CO	CO	CO	CO
NIK225 - FTSE	CO	CO	CO	CO	CO	CO
NIK225 - DJIA	CO	CO	CO	CO	CO	CO

* CO = Pair is cointegrated.

Vector Error Correction

The vector error correction (VEC) model is a model designed for use with a non stationary series (which is determined earlier in the Augmented Dickey Fuller test) that are known to be cointegrated. In the Johansen's test, we identified the pairs of markets that cointegrate. In the VEC test from the pairs that cointegrate earlier, we identify the independent market that significantly affect (i.e. 95% confidence level) that particular dependent market. The detailed results for this test are shown in Table 5 (on page 111). The t values are collected from each independent market.. We next identify the markets having t values above 1.645. This means that the independent market is significantly affecting the dependent market.

We can see from the above table 5, big market like America and Hong Kong lead other small markets in the Asia Pacific regions with little feedback from these markets although they are significant. India and China markets are seem independent from other markets.

Result and Discussion

Long Term Cointegration between the Developed and Developing Markets

The first research question asks whether there is a relationship between the movement of capital markets in a developed economy and their counterparts in the Asia Pacific region. The developed economy having the strongest relationship with the Asia Pacific region is the United States. In the long run, the American bourse cointegrates with most Asian bourses but the influences from the Asian markets are not significant.

Chan (1992) noted that there is no evidence of cointegration among the stock prices of Hong Kong and a few Asian countries in the 1987 to 1993 period. We note that the premise presented by Chan (1992) has hardly changed in the 1997 to 2007 period. We agree with Chan (1992) the markets in Asia are weak form efficient.

In the long run, we observe that the American bourse cointegrates with most Asian bourses in the 1997 to 2003 period. This differs from Chan's (1992) observation of the 1987 to 1993 period. Major institutional investors such as California Public Employees' Retirement System (CalPERS) come from the United States and a have a lot of their overseas investments in Asia. Argentina, Brazil, Chile, Czech Republic, Hungary, Israel, Jordan, Malaysia, Mexico, Peru, Poland, South Africa, South Korea, Taiwan, and Turkey will are on CalPERS permissible markets investment list in 2004.

It is natural that events happening in the United States have a significant effect on the Asian bourses. As mentioned earlier, the events of September 11, 2001 affected

Table 3. Long Run Cointegration of Different Sub Regions in the Asia Pacific Region

1997 to 2003	Lag 1	Lag 2	Lag 3	Lag 4	Lag 5	Lag 6
	Critical Value	Critical Value	Critical Value	Critical Value	Critical Value	Critical Value
Different sub regions	Variance	Variance	Variance	Variance	Variance	Variance
Australiasia and South Asia						
BSE - ASX	CO	CO	CO	CO	CO	CO
BSE - ASX	CO	CO	CO	CO	CO	CO
Australiasia -North Asia						
HANGSENG - ASX	CO	CO	CO	CO	CO	CO
HANGSENG - ASX	CO	CO		CO	CO	CO
NIK225 - ASX	CO	CO	CO	CO	CO	CO
NIK225 - ASX	CO	CO	CO	CO	CO	CO
SZSB - ASX	CO	CO	CO	CO	CO	CO
SZSB - ASX	CO	CO	CO	CO	CO	CO
North Asia -South Asia						
HANGSENG -BSE	CO	CO	CO	CO	CO	CO
HANGSENG -BSE	CO	CO	CO	CO	CO	CO
NIK225 - BSE	CO	CO	CO	CO	CO	CO
NIK225 - BSE	CO	CO	CO	CO	CO	CO
SZSB - BSE	CO	CO	CO	CO	CO	CO
SZSB - BSE	CO	CO	CO	CO	CO	CO
South Asia - ASEAN						
KLSE - BSE	CO	CO	CO	CO	CO	CO
KLSE - BSE	CO	CO	CO	CO	CO	CO
STI - BSE	CO	CO	CO	CO	CO	CO
STI - BSE	CO	CO	CO	CO	CO	CO
Australiasia - ASEAN						
KLSE - ASX						
KLSE - ASX				CO		
STI - ASX	CO	CO	CO	CO	CO	CO
STI - ASX	CO	CO	CO	CO	CO	CO
North Asia - ASEAN						
KLSE - HANGSENG				CO		
KLSE - HANGSENG		CO		CO	CO	CO
STI - HANGSENG		CO		CO	CO	CO
STI - HANGSENG	CO	CO	CO	CO	CO	CO
NIK225 - KLSE	CO	CO	CO	CO	CO	CO
NIK225 - KLSE	CO	CO	CO	CO	CO	CO
SZSB - KLSE	CO	CO	CO	CO	CO	CO
SZSB - KLSE	CO	CO	CO	CO	CO	CO
STI - NIK225	CO	CO	CO	CO	CO	CO
STI - NIK225	CO	CO	CO	CO	CO	CO
SZSB - STI	CO	CO	CO	CO	CO	CO
SZSB - STI	CO	CO	CO	CO	CO	CO

* CO = Pair is cointegrated.

markets all over the world including major bourses such as Hong Kong, Tokyo and Sydney. The Staff of the International Monetary Fund (2001) reported a close cointegration between the developed and emerging economies as a result of the tragedy. The Malaysian bourse had to be closed the next day after the September 11, 2001 incident. The connection of the British bourse with other bourses is quite limited as only Japan cointegrates with this bourse and only in the 2000-2002 periods.

Table 4. Long Run Cointegration of the Same Sub Region in the Asia Pacific Region

1997 to 2003	Lag 1	Lag 2	Lag 3	Lag 4	Lag 5	Lag 6
	Critical Value	Critical Value	Critical Value	Critical Value	Critical Value	Critical Value
Same sub region	Variance	Variance	Variance	Variance	Variance	Variance
North Asia						
NIK225 - HANGSENG	CO	CO	CO	CO	CO	CO
NIK225 - HANGSENG	CO	CO	CO	CO	CO	CO
SZSB -HANGSENG	CO	CO	CO	CO	CO	CO
SZSB -HANGSENG	CO	CO	CO	CO	CO	CO
SZSB - NIK225	CO	CO	CO	CO	CO	CO
SZSB - NIK225	CO	CO	CO	CO	CO	CO
ASEAN						
STI - KLSE						
STI - KLSE	CO	CO	CO	CO	CO	CO

* CO = Pair is cointegrated.

Asia Pacific Region

The second research question asks whether there is a relationship between the movements of one established market in one sub region with one another emerging market in another sub region. Again the answer is yes, region specific. Malaysia is one market that in the long run cointegrates with other markets in the region especially with Hong Kong and Australia. However the effects of other Asian markets on the South East Asian markets are insignificant in the long run. Singapore in the long run is independent from the results other Asian markets.

Long Term Cointegration between the Markets in the Same Asia Pacific Sub Region

The final research question is whether there is a relationship between the movement of one emerging markets in the region with another in the same sub region. Again the answer is yes, but the relationship is region specific with South East Asia having the strongest relationship. Surprisingly in the long run, the North Asian markets do not cointegrate with each other. Malaysia and Singapore show a cointegration among each other in the smaller sub periods but not in the longer 1997 to 2007 period. To the Malaysia-Singapore investor, the long run lasts only between 1 to 2 years. The Vector Error Correction Model test shows that the Greater China markets do not cointegrate with each other in the long

Implications of the Study

The American market must be studied carefully and understood by investors as this is the most important bourse that influences their investments. This is because in the long term term this market has the greatest influence on most of the surveyed Asian markets. Cointegration market trends are region specific. Investors must understand which is markets influences or is influenced by in each region. Unlike the approach used by earlier researchers (i.e. Knif and Pynnonen (1999) who use many different international markets, we found that analysis based on sub regions show clearly the effects of one market on the other. We must not lump all the markets in Asia as one generic pool but to appreciate the different characteristics of each market. From the results we know that South East Asia is different from Greater

China or even India. As the different regional markets begin to mature, they begin to have their own characteristics. Any future studies must take to account the various characteristics of each sub region.

Although this topic is well researched, a continuous review process is needed to look at the latest trends judging from the literature review that the results of the studies change according to time. Japan in earlier literature was mentioned as a great influencing factor towards other

Table 5: Vector Error Correction Model

1997-2002	Independent variables								
DEPENDENT VARIABLE	ASX	BSE	DJIA	FTSE	HANGSENG	KLSE	NIK 225	STI	SZSB
ASX(-1)	1	0.23601	-7.23523*	-1.62852	6.14384*	0.09966	3.0483*	-5.45653*	-1.4626
BSE(-1)	0.23601	1	-0.23661	-0.23354	0.23592	0.08933	0.23705	-0.23625	-0.2315
DJIA(-1)	-7.23523*	-0.23661	1	1.54292	-10.1539*	-0.0997	-3.5417*	6.3059*	1.47013
FTSE(-1)	-1.62852	-0.23354	3.54292*	1	-1.65674	-0.09981	-2.56695*	1.59638	1.14416
HANGSENG(-1)	6.1438*	0.23592	-10.1539*	-1.65674	1	0.09967	3.4218*	-8.27999*	-1.4933
KLSE(-1)	0.09966	0.08933	0.0997	-0.09981	0.09967	1	0.09942	-0.10003	-0.1003
NIK225(-1)	3.0483*	0.23705	-3.54177	-1.56695	3.42181*	0.09942	1	-3.2524	-1.3563
STI(-1)	-5.45653	-0.23625	6.3059*	1.59638	-8.27999	-0.10003	-3.2524	1	1.43298
SZSB(-1)	-1.46259	-0.23149	1.47013	1.14416	-1.49331	-0.10031	-1.35633	1.43298	1
2003-2007	Independent variables								
DEPENDENT VARIABLE	ASX	BSE	DJIA	FTSE	HANGSENG	KLSE	NIK 225	STI	SZSB
ASX(-1)	1	-3.67135*	3.5157*	-5.29828*	4.83168*	-2.9663*	-3.35676*	-4.02913*	-2.2392*
BSE(-1)	-0.67135	1	-0.59958	0.62969	0.73676	1.73711	0.94924	1.58845	1.20514
DJIA(-1)	3.5157*	-1.59958	1	6.04757*	-4.1861*	-1.2183	-3.13467*	-4.1861*	-2.2183*
FTSE(-1)	-5.29828	4.6296*	-6.04757	1	-15.3433	3.4029*	3.5411*	5.4614*	2.4314*
HANGSENG(-1)	4.8316*	1.73676	5.4309*	-15.3433	1	-1.47093	-3.6908*	-6.2614*	-2.4612*
KLSE(-1)	-2.9663*	1.73711	-2.90544*	3.4029*	-3.47093*	1	2.4088*	2.7276*	1.8835*
NIK225(-1)	-3.35676*	2.9492*	-3.1346*	3.5411*	-3.69087*	2.4088*	1	3.0634*	2.0367*
STI(-1)	-4.02913	3.5884*	-4.186*	5.4614*	-6.26146	2.7276*	3.0634*	1	2.1984*
SZSB(-1)	-1.23922	1.2051	-1.2183	0.4314	-1.46122	0.8835	2.0367*	2.1984*	1

1997-2007	Independent variables								
DEPENDENT VARIABLE	ASX	BSE	DJIA	FTSE	HANGSENG	KLSE	NIK 225	STI	SZSB
ASX(-1)	1	1.15454	-5.4603*	3.4730*	3.15869	-2.5218	2.84814*	-2.44229	0.95676
BSE(-1)	1.15454	1	-1.18817	1.1330	1.10997	1.1075	1.16739	1.104	0.7853
DJIA(-1)	-5.460*	-1.18817	1	5.44746*	-4.16992*	2.85421*	-3.57504*	2.5141*	-0.9885
FTSE(-1)	3.47302*	1.1330*	-5.4474*	1	2.80726*	-2.5094*	2.77702	2.1372*	0.9884*
HANGSENG(-1)	3.15863*	1.10997	-4.16992*	2.80726*	1	-2.55841*	2.65795*	-2.9308*	0.94146
KLSE(-1)	-2.5218	-1.1075*	2.8542*	2.5094*	-2.55841	1	-2.39013	1.6664*	-0.965*
NIK225(-1)	2.8481*	1.16739	-3.57504*	2.77702*	2.65795*	-2.39013*	1	-2.0907*	0.96223
STI(-1)	-2.44229*	-1.10449	2.51413*	-2.1372*	-2.93084*	1.66643	-2.0907*	1	-0.974
SZSB(-1)	0.95676	0.7853	-0.98846	0.9884	0.94146	0.9652	0.96223	-0.97401	1

markets but again in this research, the Japanese market factor is waning. The level of cointegration rises with the level of proximity between markets. The further the dependent market is from the independent market the lower the level of market cointegration. Researcher should look at the latest periods rather than periods too far back in history as markets dynamics change very rapidly. By breaking up the tests in this research into little sub periods, it is noted that results from one sub period may even contradict another period. The academic tradition of looking of far off historical periods (i.e. concentrating of the Asian Financial Crisis or the 1980s) maybe suitable for academic discussion but is not useful at all to the general public for financial planning purposes.

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