MALAYSIAN EQUITY MARKET AND ITS TRADING BLOCS: A STUDY ON THE LONG-RUN RELATIONSHIPS

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DECLARATION

We hereby declare that:

(1) This UBFZ3026 Research Project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

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DEDICATION

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We also dedicate a message to those who are reading our thesis. "Be the Best, Beat the Best". We must try our best to produce the finest work as possible. Besides that, we must always improve ourselves by beating the Best. Time management and well organized planning are important to produce a good quality thesis. There is always a way to solve a problem as nothing is impossible.

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List of Abbreviations

ASEAN	The Association of Southeast Asian Nations
NYSE	New York Stock Exchange
U.S.	United States
KLSE	Kuala Lumpur Stock Exchange
KLCI	Kuala Lumpur Composite Index
IMF	International Monetary Fund
FTSE	Financial Times Stock Exchange
U.K.	United Kingdom
S&P 500	Standard & Poor 500
VECM	Vector Error Correction Model
ALLORDS	All Ordinaries
DJIA	Dow Jones Industrial Average
VAR	Vector Auto Regression
VDC	Variance Decomposition
IRF	Impulse Response Function
ECM	Error Correction Model
MSCI	Morgan Stanley Capital International
DCC GARCH	Dynamic Conditional Correlation GARCH
ADF	Augmented Dickey Fuller
PP	Philips-perron
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
HSCI	Hang Seng Composite Index
KOSPI	Korea Composite Stock Price Index
GDP	Gross Domestic Product
HDI	Human Development Index
UNDP	United Nations Development Program
AIC	Akaike's Information Criteria
BIC	Bayesian Information Criterion

CUSUM	Cumulative Sum Control Chart
GIRF	Generalized Impulse Response Function
OLS	Ordinary Least Squares

PREFACE

Stock market is a public entity in which shares of corporations are traded. Investors often seek for the opportunity to earn more income through the stock market. In fact, they can gain huge profit if they are able to predict the flow of the stock market volatility. It is believed that investing in the international stock markets instead of only in the local market will provide investors with a more diversified portfolio with reduced risk and enhanced returns.

It is therefore a need for investors to have knowledge of the equity market integration level of different countries to enable the prediction on the movement of stock markets. Besides, it is also important to know which market is the leading stock market within the region as changes in the economic condition of the leading stock market will affect the others.

A research in the linkages on five trading blocs which includes Developed markets, Tiger market, Asia Pacific market, Association of Southeast Asian Nations (ASEAN) market, and Emerging market will indeed be interesting especially after the financial crisis period where there are changes of policies and economic conditions. The focus of the study is to test the long term relationship and granger causality between the Malaysian stock market with the five trading blocs.

ABSTRACT

Many previous studies have indicated that international stock markets have become more integrated in recent years. This evidence is unquestionable as most of the recent studies have found equity markets to be inter-linked. This research attempts to re-investigate the whole markets' relationship after the 1997 Asian financial crisis where several changes in policies and economic condition have taken place. Five trading blocs are used to represent the market as a whole in order to provide a better understanding on the market linkages. The tests used in this study include Unit Root Test, Cointegration Test, General Impulse Response Function, Variance Decomposition and Granger Causality Test. The results indicated that, there is a long run relationship between Malaysian market and the five trading blocs. Malaysia is found to be affecting Japan, Hong Kong, South Korea, Australia, New Zealand, Thailand, and China and being affected by United States, Japan, Canada, South Korea, and Thailand. Developed markets seem to have the greatest impact on Malaysia equity market.

CHAPTER ONE
INTRODUCTION

1.1 Background of the study

Some researchers in the past have proven the existence of financial market linkages between certain countries around the world. It is widely believed that the shock to one economy will be transmitted to other economies which are highly correlated. From few past researches, it is found that the correlations of some of the capital markets are fundamentally different after crisis. The evidence on stock market integration is mixed and conflicting, with many of the studies not directly comparable as they were conducted on different stock market indices over various sample period, and using different frequencies of return which include daily, weekly, and monthly return. Some study has suggested that the markets are getting more and more integrated after crisis (Chandra, 2006; Ali & Wan Mahmood, 2007; Royfaizal, Lee, & Azali, 2009). However, the study by Chan (2002) has found small lead effect after the crisis.

The crisis of October 1987 (also known as the Black Monday) has led to the interest of study on the linkages and direction of information flow among the different capital markets around the world. In 1987, the drastic drop of 22.61 percent on the New York Stock Exchange (NYSE) did not only affect the United States (U.S.) market, but has also impacted other financial markets around the world. For example, on the next day of the crisis, the Asian financial markets faced the adverse effects. Besides that, stock markets in Hong Kong and Australia had also fallen by 40 to 45 percent by the end of the month (Wasiuzzaman & Lim, 2009).

Some studies previously conducted have shown signs of strengthening correlation across the international markets during crash times. The reason is that the investors at that time viewed events happening in the U.S. to have a great impact on the countries they have been investing in. This happening seems to designate that the world economy is being led by the U.S.. As quoted by Chan (2002), “The financial market in the U.S. has long been seen as the leader of the global financial market.” The shocks and crisis generated in U.S. can be transmitted to other countries easily.

Ten years later, Asian countries faced another wave of financial crisis. Countries in the region such as Malaysia, Indonesia, Thailand, and Philippines, were also affected. In July 1997, the Kuala Lumpur Stock Exchange (KLSE) Composite Index (KLCI) has dropped by more than 50 percent from 1,200 points. The Philippines stock market also fell by two-thirds from 3,000 points to 1,000 points within the same year. Not only did the countries in the South-East Asia were deeply affected, the crisis has also generated significant effect on the U.S. and Japanese stocks as well (Sundaram, 2006).

In 2008, another global financial crisis originated by a liquidity shortfall in the U.S. banking system has caused the collapse of few large financial institutions, the “bail out” of banks by national governments and downturns in stock markets around the world. As a result of the collapse of the U.S. housing bubble, the values of securities tied to real estate prices dropped drastically and thereafter damaged financial institutions globally. Questions regarding bank solvency, declines in credit availability, and damaged investor confidence had greatly impacted the global stock markets, where securities suffered large losses during the late 2008 and early 2009 [International Monetary Fund (IMF), 2009].

International market cointegration can be investigated in various ways. One method is to test a hypothesis that asset returns are the same in different markets on a risk-adjusted basis. Perfectly integrated world capital markets would imply identical risk-adjusted asset returns. This presumes an international asset pricing model, or whether and how such distinct international risks, such as currency risk and political risk, are incorporated in asset pricing models.

Another popular method of testing international market linkages is correlation. However, apart from the criticism made by Forbes and Rigobon (2002) that the popular correlation measures contain heteroskedasticity bias, there is only a limited sense in which correlations can be regarded as a measure of market integration. Another method is cointegration test which reveals that there is a long run relationship between the markets. Finally, Granger Causality test is used to show that one market is affecting another market.

1.1.1 Background of Bursa Malaysia and the FTSE Bursa Malaysia KLCI

The first formal securities business organisation in Malaysia was established in 1930, known as The Singapore Stockbrokers' Association. It was then re-registered as the Malayan Stockbrokers' Association in 1937. The commencement of public trading of shares in 1960 has resulted from the establishment of the Malayan Stock Exchange where the board system had trading rooms in Singapore and Kuala Lumpur, linked by direct telephone lines. (Bursa Malaysia, 2011a)

In 1964, the Stock Exchange of Malaysia was established. On the following year, the same exchange subsequently became known as the Stock Exchange of Malaysia and Singapore with the secession of Singapore from Malaysia. In 1973, after the currency interchangeability between Malaysia and

Singapore come to an end, the exchange was being divided into the Kuala Lumpur Stock Exchange Berhad and the Stock Exchange of Singapore. The operations of Kuala Lumpur Stock Exchange Berhad were taken over in 1976 by the KLSE which was incorporated on December 14, 1976.

On April 14, 2004, KLSE was changed to Bursa Malaysia Berhad following its demutualization exercise with the purpose of enhancing its competitive position and responding to global trends in the exchange sector by becoming more customer-driven and market-oriented. Bursa Malaysia was then listed on the Main Board of Bursa Malaysia Securities Berhad on 18 March 2005. Presently, 842 companies was listed on the Main Market of Bursa Malaysia while 113 in the ACE market, contributing to a total of 955 companies. (Bursa Malaysia, 2011a)

The Industrial Index, launched in 2 January 1970 was the first barometer of the Malaysian stock market. It was comprised of 30 industrial stocks with the base year of 1970. By 1985, the Industrial Index was no longer able to reflect the Malaysian stock market. The KLCI which was reflective of the stock market performance, sensitive to investors' expectation, indicative of Government policy changes, and responsive to structural changes in the economy was introduced in 4 April 1986. The KLCI was launched as an open ended index with a total of 83 companies and was calculated three times a day with the trading volume criteria of 250 lots per annum. On 30 January 1990, the calculation frequency was improved to every 15 minutes. Trading volume criteria was increased to 1,000 lots per annum on 29 May 1992. The number of constituents was increased and fixed at 100 on 18 April 1995 to accommodate the listing of stock index futures and computation frequency increased to every 60 seconds.

On 6 July 2009, the KLCI became known as Financial Times Stock Exchange (FTSE) Bursa Malaysia KLCI, an effect on the adoption of the FTSE's global index standards in ensuring that it remains robust in the measurement of the national economy with growing connection to the global economy. The FTSE Bursa Malaysia KLCI was enhanced by adopting the internationally accepted index calculation methodology with the intention of providing a more investable, tradable and transparently managed index. Despite the introduction of the FTSE Bursa Malaysia KLCI, the FTSE Bursa Malaysia Top 100 Index and FTSE Bursa Malaysia EMAS Index was also available to existing users of the KLCI who prefer a broader coverage of companies.

One of the improvements was the number of constituents has been changed from 100 to 30 largest companies by full market capitalisation on the Bursa Malaysia's Main Market so that it could be managed more easily and become more appealing for the creation of Index Linked products to promote market liquidity. There are two main eligibility requirements to be fulfilled in order to be selected as a FTSE Bursa Malaysia KLCI constituent. Each company is required to have a minimum free float of 15% and a liquidity screen is to be applied to ensure that the company's stocks are liquid enough to be traded.

The calculation of the FTSE Bursa Malaysia KLCI was performed using the real time and closing prices sourced from Bursa Malaysia based on a value weighted formula and adjusted by a free float factor. The frequency of index calculation was also changed from every 60 seconds to 15 seconds to track the market pulse closely and efficiently. (Bursa Malaysia, 2011b)

In preserving the continuity of the KLCI, the historical index values of KLCI was retained for the new FTSE Bursa Malaysia KLCI up to 3 July 2009. The closing value of the KLCI on 3 July 2009 was made the opening value of the FTSE Bursa Malaysia KLCI on 6 July 2009 (FTSE, 2009).

1.2 Theoretical Framework

There are many findings regarding cointegration between the Malaysian stock market and various stock markets, with most of the studies focusing on ASEAN stock markets. Choudhry & Peng (2007) has found that there are significant linkages between the Malaysian stock market and the Asian markets which include Thailand, Indonesia, Hong Kong, Singapore, Philippines, South Korea and Taiwan during the crisis period (1988 to 2003). Another study has shown that the Malaysian stock market was closely linked to the Singaporean stock market in the beginning but has grown slowly out of the trend over the period (Ng, 2002). Other than that, Azman-Saini, Azali, Habibullah, & Matthews (2002) has proven that only the Philippines stock market affects the Singapore stock market in the long-run while other stock markets such as Malaysia, Indonesia, and Thailand do not. Another study has proven that the U.S. market has significant influence on the Malaysian stock market (Lim, 2008). Roca, Selvanathan and Shepherd (1998) have found that there are bi-directional causality between Malaysia with Singapore, and Malaysia with Thailand. Furthermore, Malaysia is the most influential among The Association of Southeast Asian Nations (ASEAN) markets.

In addition, there are also studies of linkages conducted among Developed markets. The Japanese stock market is found to be significantly moving the Malaysian stock market compared to the U.S. stock market for the post-crisis period (Yusof and Majid, 2006). There is long term relationship between the U.S., Japanese, and Malaysian stock market after crisis, proven by Wasiuzzaman and Lim (2009), with the existence of a bi-directional causality between the Malaysian and Japanese stock market. The Malaysian market is also influenced by all countries undertaken but has influence only over the Japanese market. Malaysian stock market is more integrated with the Japanese stock market compared with U.S. stock market during the post-1997 financial crisis period, studied by Yusof and Majid (2006).

Investigation of linkages between the Malaysian stock market and Tiger Market has also been conducted. The Malaysian stock market is influenced by the Hong Kong, South Korea, and Taiwan stock market while the Singaporean market is influenced by the Malaysian stock market across the crisis period of 1997 to 2007 (Marimuthu and Ng, 2010).

Some researchers have also investigated the linkages among Asia-Pacific stock markets. Sheng and Tu (2000) examine the linkages among 11 major Asia-Pacific stock markets including Malaysia before and during the crisis. The result shows that the relationship between the Southeast Asian countries is stronger than the Northeast Asian countries. According to Ghosh, Saidi, & Johnson (1999), the U.S. stock market is found to have a long-run relationship with Hong Kong, India, Korea, and Malaysia, while the Japanese stock market is linked to Indonesia, Philippines and Singapore. Chandran and Rao (2009) has also investigated the relationship between the Malaysian stock market with Emerging East Asian countries which include South Korea, Taiwan, Hong Kong, and Japan. The result shows that the Malaysian stock market is influenced by all the markets tested except Japan.

In our study, we would like to see a clear picture of the linkages between the Malaysian stock market and other stock markets as a whole and also in detail with the latest information. Referring to the studies done above, we decided to divide the stock markets into five trading blocs which are Developed Markets which include U.S., United Kingdom (U.K.), Canada and Japan, Tiger Markets which include South Korea, Taiwan, Singapore and Hong Kong, Asia-Pacific Markets which include Australia and New Zealand, ASEAN Markets which include Singapore, Indonesia, Thailand, Philippines and Vietnam, and Emerging Markets, which include China and India. From the result of our study, we are able to know the co-movement between the Malaysian stock market with various trading blocs. We are able to observe which stock market has the most influence on the Malaysian stock market. In detail, we are also able to know how each individual stock market affects each other within each bloc by using the granger causality test.

The time frame we have used in our study is from Jan 2000 to October 2010. We are more concerned about the linkages which exist after the crisis period. The Asian Financial crisis was ended on 2000, according to Sundaram (2006). Since then, we are interested to find out whether there are still significant relationships between the Malaysian stock market and all markets in the five trading blocs after the changes of policy due to crisis. Our study will also provide the latest information about the linkages between various stock markets.

1.3 Problem Statement

Malaysia has experienced uproar in the stock market when the 1997 Asian financial crisis hit Malaysia. The impact of the crisis on Malaysia was traumatic. The Malaysian stock market nearly collapsed and the overall economy of Malaysia was affected. The Malaysian stock market, which was already experiencing a downward trend before crisis, declined dramatically due to the crisis. The KLCI has fallen from 1271 points in February 1997 to 897.25 points in August 1997, and reached a historical low price of 262 points on 1 September 1998. The drop in Malaysian stock market has directly and indirectly affected the Malaysian economy and also its political system (Lee & Tham, 2010).

In this new millennium, years after the 1997 Asian financial crisis, various policies and regulations have been employed over the years by each country to solve their economic problems in order to recover their economies. For example, Malaysia adopted mildly expansionary monetary and fiscal policies, by pegging the currency at RM3.80 per dollar and severely tightened its capital account controls. Whereas Indonesia and Thailand abandoned their long standing policies of pegging their currencies to baskets that were overwhelmingly dominated by the dollar and announced the adoption of floating exchange rate regimes and restrictive monetary policies based on targets for restraining the rate of growth of base money (M0). From the previous study, it was proved that the market linkages did exist between the certain countries in the world before the 1997 Asian financial crisis. However, with the changes of policies implemented in individual country after 1997 Asian financial crisis, are we going to get the same results as previous studies?

This study makes an attempt to find out whether linkages exist among the stock markets of several selected trading blocs after 1997 Asian financial crisis. It is important to find out the linkages between the Malaysian stock market and the other five trading blocs which are the Emerging markets, Asia Pacific markets, ASEAN markets, Tiger markets, and Developed markets. Investigating on these five blocs consisting of major markets in the world, we would like to see an overall clear picture of how each of the individual markets selected cointegrates with the Malaysian market and also how the co-movement of every individual stock market affects each other in each bloc in detail. Since past researchers did not study much on the market linkages as a whole, there is a need for us to examine the overall view of the whole market's co-movement. It is insufficient to have a clear picture on the co-movement of the whole world markets from existing studies since all the past researches are only focusing on the relationship among some specific markets. Therefore, we would like to conduct this research to investigate the whole markets' relationship where we use the five trading blocs to represent the market as a whole in order to provide us a better understanding on the market linkages. Besides that, our research can also provide investors with the most up-to-date information regarding the relationship between the stock markets of several selected trading blocs for the purpose of portfolio diversification.

1.4 Research Questions

Based on the problem statement highlighted above, we further clarify the following research question.

(1) Does long term relationship exist among the equity markets of different trading blocs?

(2) Do the trading blocs significantly affect the Malaysian market?

(3) Are there any unilateral or bilateral relationships among the Malaysian market and various trading blocs?

(4) Which markets among the various trading blocs have significant impact on the Malaysian market?

(5) Which markets in each of the trading blocs has the greatest impact on the Malaysian market?

(6) To what extent do economic shocks affect the Malaysian market?

1.5 Research Objectives

Several objectives have been identified in our study. The first objective is to investigate the existence of inter-linkages among international equity markets. We would like to discover whether there is equity market integration after the economy crisis of 1997. Specifically, we would like to examine the relationship between the Malaysian equity market and five trading blocs: Developed markets, Tiger markets, Asia Pacific markets, ASEAN markets and Emerging markets.

The second objective is to investigate if the markets selected have unilateral or bilateral causality between the Malaysian market and each of the trading blocs. In other words, we would like to determine which market is useful in forecasting another market. Therefore, Granger Causality test will be carried out to identify the causal linkages between the stock markets and to have a clear picture of which markets exert influence over the others after the 1997 Asian financial crisis.

The third objective is to measure short term shocks impulsed by other markets to the Malaysian market after the 1997 Asian financial crisis using trading blocs. We would like to discover which equity market inside each trading bloc impacts the Malaysian market the most. We are also interested to examine whether the leaders of the global financial market such as U.S. or Japan equity market has more impact on the Malaysian equity market.

1.6 Outline of the Study

The first chapter of this study provides some background information, theoretical framework, problem statement, research questions and research objectives of the study. The remainder of this research is organized as follow: Chapter Two discussed the review of literature of market linkages between the Malaysian stock market and Developed markets, Tiger markets, Asia Pacific markets, ASEAN markets, Emerging markets and other markets. Chapter Three gives a comprehensive description of the methods and the tests applied in the study, while results are analyzed and reported in Chapter Four and Chapter Five summarises this study and implication suggested.

CHAPTER TWO
LITERATURE REVIEWS

2.1 Developed Market

Three mature stock indices from the U.S., Japan and U.K. have been chosen by Floros (2005) as the most prominent representatives of the international financial markets. This study has examined the short-term and long-term relationships among stock prices in the U.S., Japan and U.K.. The data employed in this study comprises of the daily observations on the Standard & Poor (S&P 500), Nikkei 225 and FTSE-100 stock indices from 1988 to 2003. The Vector error correction model (VECM) is used to investigate short- and long-run fluctuations and movements in stock markets. The results showed that FTSE-100 and Nikkei 225 have both short-and long-term information effects on the S&P 500 index. Besides that, by using cointegration techniques (Johansen method) and Granger causality tests, it is proven that U.S., Japan and U.K. markets are cointegrated. Thus, there is strong evidence of a long-run relationship between the matured stock markets. Furthermore, Granger causality tests shows a bi-directional causality between Nikkei 225—FTSE-100, and unidirectional causalities between S&P 500—FTSE-100 and S&P 500 – Nikkei 225.

Kazi (2008) has studied whether the Australian stock market was integrated to the equity markets of its major trading partners under the influence of globalization. The cointegration technique of Johansen (1996, 2000) was used to verify if the selected overseas stock markets (U.K., U.S., the Canadian, German, French and the Japanese stock markets) were linked to the Australian market. Essentially, the long-run relationship among selected markets is investigated using 1945 to 2002 yearly index value of the All ordinaries (ALLORDS), Dow Jones Industrial Average (DJIA), FTA, SBF250, DAX, TSX300, and NIKKEI for Australia, U.S., U.K., Canada, Germany, France, and Japan respectively. The results showed that all Australian stock market has a long-run relationship with all the selected markets. Out of these significant markets, the most influential market for Australia is the U.K. In other words, U.K was dominating the Australian market.

Another study reinvestigates international stock market linkages, based on a theory proposed for the possible link between financial market integration and nonlinear cointegration, by performing both conventional linear cointegration tests and newly developed rank tests for nonlinear cointegration. The stock price indexes of Australia, Japan, New Zealand, the U.K. and the U.S. are used, with daily data spanning from 29 May 1992 to 10 April 2001. It is found that there is much more evidence of market integration emerging from nonlinear than linear cointegration analysis, suggesting that comovements among various national stock markets may well take nonlinear forms, which challenges the conclusion of market segmentation reached in some previous studies that only conduct linear cointegration analysis. (Li, 2006)

Wong, Penm, Terell, and Lim (2004) have conducted a study about stock market linkages between developed market and Asian emerging market after the 1997 Asian Financial Crisis. Malaysia, Thailand, Korea, Taiwan, Singapore, and Hong Kong represented Asian emerging market while U.S., U.K., and Japan represented developed market. Time frame in the study covered the period from January 1, 1981 to December 31, 2002 covering both crisis period of 1987 and 1997. Co-integration test is used in the study with the result that Singapore and Taiwan co-integrate with Japan while Hong Kong co-integrates with the U.S. and UK. Malaysia, Thailand, and Korea have no long run relationship with U.S., U.K. and Japan. However, there was an increase in interdependence between most of the developed and emerging market after the crisis of 1987 and also 1997.

Another research examines the linkages among the stock market in New Zealand with Australia and G-7(Seven of the world's leading countries that meet periodically to achieve a cooperative effort on international economic and monetary issues.) stock markets which include Canada, France, Germany, Italy, Japan, U.K. and U.S.. Tests used are unit root test and Co-integration Johansen test. The research concludes that there are long run relationships among all the markets undertaken. (Narayan and Smyth, 2005)

Using cointegration tests, Maneschiöld (2006) has analyzed the existence of long-run relationships among Baltic stock markets and major international stock markets, including the U.S., Japan, Germany, the U.K., and France. The bivariate and multivariate cointegration tests conducted indicate a long-run integration between Latvia and the European markets, with the German market dominating. In general, short-term Granger causality indicates causality running from the European markets to the Baltic markets, as well as among the Baltic states, excepting Latvian and Lithuanian short-term effects on the Estonian market. Overall, the results suggest that international investors can obtain diversification benefits given a long-term investment horizon because of the low degree of integration between the Baltic and international stock markets.

A study examining the long run co-movements between Malaysian stock market and the two largest stock markets in the world, i.e. the U.S. and Japan has been conducted by Yusof and Majid (2006). By employing cointegration, Granger Causality, Vector Autoregression (VAR), Variance Decompositions (VDC), and Impulse Response Functions (IRF) covering the period of 1 June 1996 to 30 September 2000, the paper investigates which market actually leads the Malaysian stock market movement before, during, and after the 1997 Asian financial crisis periods. The results indicate that there is a co-movement of these markets only in the post crisis period. The Japanese stock market is found to significantly move the Malaysian stock market compared to U.S. stock market for the post-crisis period. This finding implies that the opportunities of gaining abnormal profits through investment diversification during the post-crisis period in the Malaysian and Japanese stock markets are diminishing as the markets move towards a greater integration, which further implies that any development in the Japanese economy has to be take into consideration by the Malaysian government in designing policies pertaining to the Malaysian stock market.

Wasiuzzaman and Lim (2009) have also carried out a study to determine whether there are financial market linkages or co-movements between Malaysia, Singapore, Japan and the U.S. stock markets. The methods used in this study are correlation analysis, cointegration analysis, and Granger Causality test. The period of investigation is from January 2000 to December 2006, focusing only on the post-crisis period and the data is obtained from Yahoo! Finance website. The results indicate that the correlation between the four countries is weak, while the Johansen and Juselius Test show that there is a long run relationship between the four countries. For Granger Causality test, the result implies that the Japanese market is significantly influenced by all other countries undertaken in this study while all the countries undertaken are also influenced by Japan. The Malaysian market is also influenced by all countries undertaken but only has influence over the Japanese market. The Singaporean and U.S. market are influenced by all other countries undertaken except Malaysia and have influence over all other countries undertaken. In overall, the four stock markets seem to have financial market linkages or co-movements.

2.2 Tiger Market

Marimuthu and Ng (2010) has re-examined the dynamic relationship and dependency among the Malaysian, and the Tiger markets (Hong Kong, South Korea, Singapore and Taiwan by adopting the Johansen multivariate cointegration test and VECM by using a five-variable model, followed by the Granger causality test. The results indicate that there is a long run relationship among the five markets. Hong Kong, South Korea and Taiwan markets influence the Malaysian stock market. Conversely, the Malaysian market affects the Singaporean market.

Roca and Selvanathan (2001) examined specifically on Australia's equity market interaction with those of Hong Kong, Singapore and Taiwan in the long-run and short-run. These three countries are popularly referred to as the "three little dragons" by the world. As a group, they represented the third largest trading partner of Australia (DFAT, 1992). Price interdependence is investigated by using cointegration, error correction (ECM), Granger-causality, VDC and IRF analyses based on Morgan Stanley Capital International (MSCI) database covering the period 1975-1995. The study finds no significant linkage, both in the short term and in the long-term, between the equity market prices of Australia and these three countries. The lack of cointegration and the absence of Granger-causality between the Australian market and those of the three little dragons imply that market efficiency as in the prices of the three little dragons market cannot be predicted using past prices in Australia, and vice versa.

The unit root, cointegration, causality techniques have been conducted by Cheung, Cheung and Ng (2007) to the daily equity returns in order to examine the interactions between the U.S. market (U.S. Dow Jones Industrial Average Index) and the four East Asian markets of Hong Kong, Singapore, Taiwan and Korea (Hong Kong Hang Seng Index, Singapore Strait Times Index, Taiwan Weighted Index and Korea Composite) before (from January 1995 to June 1997), during (from July 1997 to June 2000) and after (from July 2000 to July 2002) the Asian crisis and confirmed the dominant role of the U.S. market in all the three sub-periods. There was interesting finding they have obtained which is the U.S. market does affect these four East Asian markets before, during and after the crisis however the influence of these four East Asian markets on U.S. is mainly found during the crisis. Specifically, in the post-crisis sample these markets do not affect the U.S. market.

2.3 Asia-Pacific Market

Kim (2005) found that the correlation of daily market returns was significantly higher in the post period, implying that the market linkages appeared to be enhanced after the crisis period. This study verified whether U.S. stock markets and the information leadership of U.S. and Japan in region had a stock market linkages in the advanced Asia-Pacific stock markets of Australia, Japan, Hong Kong and Singapore. This study conducted the Granger Causality Test to determine whether the U.S. and Japanese market returns and trading volume Granger caused the market returns of the other markets and also whether the U.S. and Japan volatilities and trading volume Granger caused volatilities in other markets. The U.S. returns Granger caused returns of each of the stock markets in the region in both pre- and post-crisis period. However, the Japanese return had appeared to have less significant effect on certain stock markets. It must be noted that the Japanese returns did Granger cause returns of the U.S. markets in both the periods. Volatility of market Granger caused volatilities in all the stock markets under investigation for both periods, with the exception of Hong Kong in the post-crisis. As for Japan, again, its volatility did not exert a high amount of influence in most of the markets.

Another study focused on investigation on the co-movement between the Asia-Pacific markets (Australia, Hong Kong, Japan, Korea, Singapore, and Thailand) and the markets of the U.S., the U.K. and Europe. The daily stock market index data from 1992 to 2003 were obtained from Datastream. The Dynamic Conditional Correlation GARCH model (DCC-GARCH) and Bivariate Conditional Correlation model was used to estimate the 36 pairwise pre- and post-crisis correlation series for the nine Asia Pacific markets used in this study. The outcomes of the study showed that the correlation decreased after the 1997 financial crisis was Hong Kong and Malaysia, Indonesia and Malaysia, Indonesia and the Philippines, Indonesia and Singapore, Malaysia and the Philippines, Malaysia and Singapore, Malaysia and Thailand, and the Philippines and Singapore whereas the correlation between Australia and Korea, Korea and Singapore, and Hong Kong and Korea were significantly increased after the crisis. Besides that, there was an interesting finding which is the markets of Japan and Korea have become more correlated with a majority of the other markets in this region. (Chandra, 2006)

This paper examines the short-run and long-run price linkages among Asian Pacific equity markets in the period surrounding the Asian economic, financial and currency crises. The daily data from January 1997 to December 2000 composed of value weighted equity market indices for Malaysian, Japan, Hong Kong and Australia are used. The unit root test, co-integration test, ECM and the causality tests are conducted to study the relationship among these markets. Results show that there is a stationary long-run relationship and a significant short-run causal linkage for certain cases among Asian Pacific equity markets. Furthermore, the long-run interdependence has strengthened since the beginning of the crises. (Ali & Wan Mahmood, 2007)

2.4 ASEAN Market

Park (2010) had studied the linkages of 11 Asian Stock Markets including Thailand, Malaysia, Indonesia, Singapore, the Philippines, Korea, Japan, China, Hong Kong, Taiwan, and India and U.S by using correlation analysis and the extended GARCH model. Data period were divided into two parts, i.e. period 1 (January, 2005 - December, 2006) and period 2 (January, 2006 - December, 2008). High correlation was found between the Asian markets and U.S. market. The results also exhibited that mean spillover effect has risen significantly from the first period (2005-2006) to the second period (2007-2008). In most Asian countries, with the exception of Thailand, Indonesia, Philippines, and Taiwan, the U.S. market influence is slightly reduced. A comparison of the results between the first (2005-2006) and second (2007-2008) sub-periods reveals a recent strengthening of the Asian markets.

This study has conducted the analysis of co-integration between the countries of South East Asia region based on the historical stock price from year 1992 to year 2006. Few stock markets such as Malaysia, Singapore, Philippines, Thailand, and Indonesia were selected to represent the whole South East Asia region. Several tests were used such as Unit root test, Cointegration test, and Granger Causality test. The results suggested that there is long run integration between the South East Asian markets and it appears to be stronger after the 1997 Financial Crisis. Besides that, the results also showed that Indonesia tend to be the leading stock market in the region while Malaysia tend to be a follower in the region market. (Yeoh, Chin, & Ng, 2008)

Another study done by Mohd Nawawi, Khairol Azmi and Ramli (2010) showed that the markets investigated do not share a long run equilibrium relationship and there is a tendency that these markets do not move together in the long run. Furthermore, the research showed that the correlation coefficients among ASEAN countries (with the exception of Singapore and Malaysia) were found to be low. Analysis revealed that during the Asian financial crisis, the percentage of significant positive correlation is higher than the pre-crisis and post-crisis periods. These results suggested that there is contagion effect on Asian (or ASEAN) and U.S. markets during the crisis that make the markets move together. The data consist of daily prices of the major indices on the exchanges located in Asia; namely, Japan, South Korea, China, and ASEAN countries Singapore, Malaysia, Indonesia, Philippines and Thailand). In addition, U.S. stock market indices were used for comparison purposes. The stock market indices were obtained from Thompson database for the period between January 1988 and December 2007. The data was divided into three sub-periods namely pre-crisis period (January 1988 to May 1997), crisis period (June 1997 to January 1988) and post-crisis period (February 1998 to December 2007). Correlation analysis, unit root tests and co-integration analysis were used in this study.

Nor and Heaney (2007) examined the short-run and long-run linkages that exist between the ASEAN5 equity markets over the period from 1990 to 2006. The stock market indices were collected for each of the ASEAN5 countries, the U.S., Japan and Australia on a weekly basis. The study period employed for this study is from January 1990 to March 2006 and in accordance with the literature, the sample is divided into pre- and post-1997 crisis periods. While descriptive statistics such as the mean, median, standard deviation, minimum, maximum, skewness, kurtosis, and Pearson correlations were used in describing the data, the Augmented Dickey Fuller (ADF) test, the Phillips-Perron (PP) test, and the Kwiatkowski-Philips-Schmidt-Shin (KPSS) test were employed to test for the existence of a unit root in the series. The Johansen was used in testing for cointegration in the ASEAN5 equity markets. The results from Pearson correlation coefficients suggested that ASEAN5 markets correlation increased after the 1997 crisis, except for Malaysia. Furthermore, the results from cointegration analysis showed that these five equity markets share a long-term equilibrium relationship with each other. This relationship remained with the inclusion of the U.S., Japanese and Australian equity markets in the analysis while the returns of the Japanese and Australian equity markets was found to provide limited influence on the ASEAN5 equity markets.

A study examining long-run relationships and short-run dynamic causal linkages among the U.S., Japanese, and ten Asian emerging stock markets, with the particular attention to the 1997-1998 Asian financial crises has been conducted by Yang, Kolari, and Min (2002). The study focuses on the evaluation how the stock market integration is affected by financial crisis. Analysis of pre-crisis, crisis, and also post-crisis periods are conducted. The empirical framework used to examine long-run and short-run relationships between emerging Asian and the U.S. and Japanese stock markets in this study is cointegrated VAR framework. The results of the study suggest that both the long run and short run cointegration relationship strengthened in the crisis and post-crisis periods rather than pre-crisis period and the researchers infer that the Asian financial crisis altered the degree of market integration over time. It implies that the degree of integration among countries tends to change over time, especially around periods marked by financial crises.

Lim (2008) has also investigated the correlations and long-run relationship between the stock markets of ASEAN's five original member countries, namely Indonesia, Malaysia, the Philippines, Singapore and Thailand over the period 1990-2008 besides investigating whether there is an increase in cross-market integration after the financial crisis using daily total market-return indices from 2nd April 1990 to 30 June 2008. This study uses Granger Causality, Unit Root tests and cointegration analysis. Overall, there is some evidence of an increase in the level of integration and interdependence between the ASEAN-5 markets after the financial crisis. In addition, the U.S. market is found to have significant influence on all ASEAN-5 markets.

Another study examines whether the ASEAN-5 stock markets are integrated or segmented using the time series technique of cointegration to extract long-run relationships. Daily and weekly stock index quotes are used in local currencies data from July 1, 1998 to December 31, 2002. The empirical results suggest that the ASEAN-5 stock markets are cointegrated. However, there is only one significant cointegrating vector, leaving four common trends among the five variables. It is concluded that the ASEAN-5 stock markets are integrated in the economic sense, but that integration is far from complete. (Click & Plummer, 2003)

The study of Roca, Selvanathan and Shepherd (1998) has investigated the price linkages among five ASEAN markets such as Malaysia, Singapore, Philippines, Indonesia and Thailand, both in the long run and in the short. The study uses weekly data covering the period 1988-95 and the MSCI indices for different markets were computed using the same formula which is value weighted and therefore comparable. The study applies the techniques of cointegration analysis (Engle and Granger 1987) using the Johansen (1988) procedure, combined with Granger Causality, impulse analyses and forecast variance analyses. As a result, there is no cointegration found among the markets as a group. Thus, there is no significant long-term price linkage among the ASEAN equity markets. In the short term, the results of the Granger Causality test reveal that, with the exception of Indonesia, all the ASEAN markets has significant linkages with each other. There is a bi-directional causality between Malaysia and Singapore, Singapore and Thailand, and Malaysia and Thailand. Malaysia is the most influential among ASEAN markets. On the contrary, Indonesia is not linked at all with any other ASEAN market.

Another study focuses on the investigation of relationship between stock interaction and informative transmission among of nine stock markets in

Asian and three stock markets in U.S.. The weekly data are collected from Informed Winners Plus 2000 and the study period is from first week of January in 1990 to fourth week of June in 2007. The study uses Unit Root, cointegration test, ECM, and Granger Causality. Additionally, the study has also used IRF to detect the change in co-movement relationship between nine Asian markets and American stock markets as exogenous variable change. As a result, the study indicates that the U.S., Japan, and Hong Kong stock exert a powerful influence over the world and in particular Asian markets. (Chen & Wang, 2009)

Herwany and Febrian (2008) have assessed the cointegration and causal relations among seven developed Asian markets, i.e., Japan, Hong Kong, Korea, Taiwan, Shanghai, Singapore, and Malaysia using more frequent time series data. The study employs the recently developed techniques for investigating Unit Roots, cointegration, time-varying volatility, and causality in variance. The observations are conducted in three periods: longer period (1/3/2000 - 12/31/2007), first shorter period (1/3/2000 - 12/31/2003), and second shorter period (1/2/2004 - 12/31/2007). It is found that a linear combination of the seven indices which forces these indices to have a long-term equilibrium relationship exists. This implies that the indices are perfectly correlated in the long-run, thus diversification among these seven equity markets cannot benefit international portfolio investors. However, there can be excess returns in the short-run.

A study on three East Asian stock markets, namely, those of China, Japan and South Korea has been conducted by Sohel Azad (2009) to examine whether the markets are individually and/or jointly efficient, and whether contagion exists between the cointegrated markets. The individual market efficiency is examined through testing for the random walk hypothesis, while the joint market efficiency is examined through testing for cointegration and contagion. It is found that the hypothesis of individual market efficiency is strongly rejected for the Chinese stock market but not for the Japanese and South Korean stock markets. However, even though the Japanese and South Korean stock markets are individually efficient, these three markets are not jointly efficient under the system of cointegration due to the inefficiency of the Chinese stock market. A simple case of contagion is taken and it is found that although there is a long-term relationship among the three markets, the contagion effect exists only between the Japanese and South Korean stock markets, indicating short-run portfolio diversification benefits from these two markets.

Royfaizal , Lee and Azali (2009) studied the co-movement between the Asian stock markets namely, Malaysia, Singapore, the Philippines, Thailand, Indonesia, China, Japan, Korea, and the U.S. stock markets. Weekly stock indexes from January 1990 to February 2009 were utilized to run the test. The total samples were separated into three sub periods. First period is pre-crisis period spanning from January 1990 to June 1997. Second period is during-crisis period spanning from July 1997 to June 1998. Third period is post-crisis period spanning from July 1998 to February 2009. The results showed that the number of significant cointegrating vector is higher during the crisis periods compared to other periods. Granger-causality based on VECM showed that stock markets of Thailand, Japan and China are exogenous before, during and after the crisis respectively. It was concluded that the linkages between the Asian and the U.S. stock markets are stronger in the post-crisis period.

2.5 Emerging Market

A study has been conducted by Elfakhani, Arayssi and Smahta (2008) to determine if international diversification is still possible despite growing globalization and the consequent integration among various stock market using a sample of Arab, U.S., and emerging stock markets from 1997 to 2002. It is found that within the Arab markets, Kuwait cointegrates individually with Jordan, Tunisia, and Saudi Arabia, and between Tunisia and Jordan, offering investors possible continued diversification opportunities. On the other hand, it is found that Jordan, Kuwait, and Morocco are cointegrated with the U.S. general market index, therefore implying that these markets offer a probable substitute for those investing in the U.S. markets.

Awokuse, Chopra, and Bessler (2008) investigate the evolving pattern of the interdependence among selected Asian emerging markets and three major stock markets (Japan, U.K. and U.S.). The daily closing index prices of twelve stock markets - three largest developed markets and nine Asian emerging markets are used. Specifically, the indexes include Hang Seng, India BSE National, Indonesia Jakarta SE Composite, Japan Nikkei 225 Stock Average, Korea SE Composite, Malaysia Kuala Lumpur Composite, Philippines SE Composite, Singapore Strait Times, Thailand Bangkok S.E.T., Taiwan SE weighted, the FTSE 100 Share Index, and U.S. S&P 500 composite. By using rolling cointegration methods and the recently developed algorithms of inductive causation, it is found that time-varying cointegration relationships exist among these stock markets. Furthermore, the results show that Japan and the U.S. have the greatest influence on the emerging markets while the influence of Singapore and Thailand has increased since the Asian financial crisis.

Furthermore, the relationships between stock indices of Malaysia and the emerging East Asian countries, namely South Korea, Taiwan, Hong Kong and Japan are also examined. Daily stock indices from January 2001 to December 2006 are obtained from Datastream. The stock indices are: KLCI for Malaysia, Nikkei 500 for Japan, TACI for Taiwan, Hang Seng Composite Index (HSCI) for Hong Kong and Korea Composite Stock Price Index (KOSPI) for South Korea. By using Unit root test, Cointegration test, Granger Causality test confirmed that there is no long-run equilibrium relationship between the stock indices of Japan, Taiwan and Hong Kong and that of Malaysia, except for South Korea. Besides that, the results also showed that there is unidirectional causality running from KOSPI and HSCI to KLCI, and bidirectional causality between TACI and KLCI. It is found that stock indices of the East Asian countries except Japan, do have some influence over the movement of stock indices in Malaysia. (Chandran and Rao, 2009)

2.6 Other Developments

Another study analyzes the co-movements among three stock markets in Central and Eastern Europe, and interdependence which may exist between Western European (DAX, CAC, UKX) and Central and Eastern European (BUX, PX-50, WIG-20) stock markets. 5-mintick intraday price data from-2003 to early 2005 for stock indices is used. There is no robust cointegration relationship for any of the stock index pairs or for any of the extended specifications. Besides that, Granger causality tests show the presence of bidirectional causality for returns as well as volatility series. The results based on a VAR framework indicate a more limited number of short-term relationships among the stock markets. (Egert and Kocenda, 2007)

Another study using VAR has been investigated by Bahng and Shin (2003) on whether asymmetric responses exist among the stock price indices of China, Japan, and South Korea. The main concern of this study is to determine whether the upturns or downturns of a specific index caused asymmetric responses in other indices. The data covers a period of 10 years from the beginning of January 1991 to the end of December 2000. The results indicate that magnitude asymmetry existed between the indices of Japan and South Korea and the pattern asymmetry existed in the responses of all indices. In general, the stock market of South Korea is most heavily influenced by the unexpected innovations of Japan's and China's markets while the China's stock market is least influenced by the South Korea's and Japan's stock markets.

Mukherjee and Bose (2008) has examined the co-movement between the Indian stock market with other Asia-Pacific markets and also Developed markets where Asian-Pacific markets include Hong Kong, Korea, Malaysia, Singapore, and Taiwan and Developed market include U.S. and Japan. The time frame of the study was from January 1, 1999 to June 30, 2005 and the methods used were cointergration, VAR, VECM, and Granger causality tests. The results show that there are existences of linkages between Indian stock market with the Asia-Pacific market and also Developed market during the crisis period which lead to an increased integration after the crisis period. However, the researchers find that the U.S. market do not exert unique influence in the co-integration of Asian markets and is also influenced by most major Asian markets such as Japan, Korea, Hong Kong, Singapore, and India. Meanwhile, Japan has been found to play a unique role in the integration of Asian market since Japanese stock market significantly influences Asia Pacific and U.S. stock market. The recent Indian stock returns have been led by major stock index returns in the U.S., Japan and other Asian markets, such as Hong Kong, South Korea, and Singapore. On the other hand, the returns on the Indian market are also observed to exert considerable influence on stock returns in major Asian markets, such as Japan and South Korea, along with Taiwan and Malaysia to some extent, giving evidence that India plays a certain role in integrating these markets.

There is also a study of stock market linkages investigated on Shanghai, Shenzhen, Hong Kong, Taiwan, and Singapore which covered the period from October 5, 1992 to March 20, 2006. By using the Johansen's co-integration test, the long run relationships exist among all the markets undertaken in the study. Bootstrapped Toda-Yamamoto non-causality test is used. The result shows that U.S. market influenced Taiwan, Hong Kong, and Singapore. Before the Asian crisis, Singapore was influenced by Hong Kong while Taiwan was influenced by Singapore. For both markets in China, they are no causality with other markets undertaken. However, after the Asian crisis, there are more causal effects among the China market and other market that both the China stock markets are influenced by other stock markets undertaken. (Tian, 2008)

Narayan, Smyth, and Nandha (2004) have examined the linkages among the stock markets of Bangladesh, India, Pakistan and Sri Lanka. The tests used are Granger causality test and response functions. The findings of the study include there was long run relationship between all the markets undertaken where the stock market of Bangladesh, India and Sri Lanka influenced Pakistan's stock market and Bangladesh was the most exogenous among the other markets.

A study examined the stock market integration among Malaysia and its major trading partners such as the U.S., Japan, Singapore and China. The Johansen (1988) and Johansen and Juselius (1990) cointegration tests and VECM approach was employed in investing the dynamic linkages between markets. The data captured from the www.econstats.com database was weekly indexes from July 1998 to July 2007. In general, the empirical results revealed that, Malaysia market is significantly influenced by its major trading partners namely the U.S., Japan, Singapore and China. However, there are two long-run bidirectional relationships running from the Japanese and Malaysian stock market and the China and Malaysian stock market. (Karim & Karim, 2008)

The long-run relationship among U.S., Japan, China, and ASEAN-4 stock markets using monthly data from year 2000 to year 2006 was examined in this study. The unit root and Johansen-Juselius Cointegration test is applied in this study. As a result, U.S., Japan and China showed cointegrating relationship with ASEAN-4 countries. (Tan, Chooi, Teo, & Pek, 2008)

Rahim and Nor (2007) investigated the impact of the 1997 financial crisis on stock market lingkages in the ASEAN-5 plus 3 countries using monthly stock index data. The data period divide into two periods—pre-crisis from January 1986 to December 1996 and post-crisis from January 1997 to December 2006 by using VAR. The test result indicated that the degree of interdependence of stock markets has increases after the crisis. Besides that, Japan and Thailand become important of influencing other markets after crisis.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter seeks to explain the method of data collection and the methodologies used in order to conduct the current ongoing research. The objective of this research is to determine the existence of inter-linkages among the stock markets of Malaysia and several trading blocs. In this study, unit root test (ADF, PP and KPSS), Johansen and Juselius cointegration test, Granger Causality test, IRF and VDC will be used to determine whether the trading blocs selected shown in Table 3.1 are interlinked with the Malaysian market. The discussion of the research methodology is divided into few sections; data collection, sampling, methodology and hypothesis testing in order to complete this research study.

3.2 Data Collection

In order to investigate the inter-linkages among the stock market of Malaysia and several trading blocs (shown in Table 3.1), historical daily closing price of stock indexes from different countries were obtained for analyses. The secondary data obtained from Bloomberg (Bursa Malaysia) was employed in this research which covers a period of January 2000 to October 2010. Malaysia (KLCI) is the dependent variable, while the other countries' stock indexes in each of the five blocs are the independent variables in the five different models. The independent variables of Developed markets bloc are U.S. (DJIA), U.K. (FTSE), Japan (N225) and Canada (SPTSX). The independent variables of Tiger markets bloc are South Korea (KOSPI), Taiwan (TWSE), Singapore (FSSTI) and Hong Kong (HIS). The independant variables of Asia Pacific markets bloc are Australia (AORD) and New Zealand (NZ50). The ASEAN market bloc consists of Indonesia (JKSE), Thailand (SET), Philippines (PSEi), Singapore (FSSTI) and Vietnam (VNINDEX) whereas Emerging markets bloc consists of China (SSEC) and India (BSESN).

3.3 Sampling

The period covered for our study is from January 2000 to October 2010 and the secondary data is employed from Bloomberg at Bursa Malaysia. The reason we choose to use data from Bloomberg is because it is publicly known as a reliable sources. Besides that, previous studies analyse mostly on the correlation of markets in the world before and during the 1997 Asian Financial Crisis. Our study therefore focuses on the co-movements of 17 stock markets after the 1997 Asian financial crisis covering the period of around ten years and ten months. Malaysia (KLCI) is the dependent variable and the other countries inside the five blocs are the independent variables. The independent variables of developed markets are United State (DJIA), U.K. (FTSE), Japan (N225) and Canada (SPTSX). The variables of Tiger markets are South Korea (KOSPI), Taiwan (TWSE), Singapore (FSSTI) and Hong Kong (HIS). The variables of Asia Pacific markets are Australia (AORD) and New Zealand (NZ50). The ASEAN markets consist of Indonesia (JKSE), Thailand (SET), Philippines (PSEi), Singapore (FSSTI) and Vietnam (VNINDEX) whereas emerging markets consists of China (SSEC) and India (BSESN). These indices were chosen to represent the selected stock markets, because they are the ones generally quoted, watched and analyzed by professional and instructional investors as well as academicians. However, it should be pointed out that the results might be different if another set of stock index (e.g. Dow Jones Composite Average instead of DJIA) was used to represent a particular stock market.

For the developed markets bloc, U.S., U.K., Japan and Canada are selected into the bloc based on few criteria which are the Gross Domestic Product (GDP) and Human Development Index (HDI). These two criteria are used to describe countries with a high level of development. U.S., U.K., Japan and Canada have trends of increasing GDP growth over the years. Referring to the 2009 GDP List by the World Bank (2010) and 2010 GDP List by the IMF (2011), the GDP for U.S., U.K., Japan and Canada appears to be in the top 10. Additionally, the HDI criteria takes into account how income is turned "into education and health opportunities and therefore into higher levels of human development". This criterion would define developed countries with very high HDI rating. The rank for U.S. is 4, Canada is 8, Japan is 11 and U.K. is 26. The ranks for four countries are in the high level [United Nations Development Program (UNDP), 2011]. Therefore, the four countries are categorized into the developed markets bloc.

Tiger Markets are highly developed economies of Hong Kong, Singapore, South Korea and Taiwan. These regions were the first newly industrialized countries, which have maintained exceptionally high growth rates and rapid industrialization between the early 1960s and 1990s. All four regions have graduated into advanced and high-income level economies in the 21st century (Wikipedia, 2004).

Emerging markets are nations with social or business activity in the process of rapid growth and industrialization . At 2010, there are more than 40 emerging markets in the world, with the economies of China and India considered to be the largest (Jain, 2006). Hence, China and India have been taken to represent the whole emerging markets in our study.

The ASEAN market bloc consisted of Indonesia, Thailand, Philippines, Singapore and Vietnam which are also known as the ASEAN six major including Malaysia (Wikipedia, 2010). ASEAN six majors refer to the six largest economies in the area with economies many times larger than the remaining ASEAN countries, whereas Asia Pacific markets bloc consisted of Australia and New Zealand which is in line with the study of Mustafa and Nishat (2006).

In our study, Singapore is categorized under two blocs, i.e. the ASEAN markets bloc and Tiger markets bloc. This is because Singapore plays a very important role and has puissance in both markets. With the inclusion of Singapore in the ASEAN markets bloc and Tiger markets bloc, more accurate results can be carried out.

3.4 Methodology

3.4.1 Descriptive Statistics

Descriptive statistics are used to describe the basic features of the data in a study which provide simple summaries about the sample and the measures. The measures like mean are used to describe the center of distribution, standard deviation to measure the variation of distribution, Kurtosis to measure “peakedness” of the distribution, skewness to measure the deviation of the distribution from symmetry and Jacque Bera test to determine the probability based on the sample came from a normally distributed population of observations (Gujarati, 2003)

The data used in E-views were daily closing price from the stock indices of the chosen countries. The observations consist of daily returns of each stock market. Daily returns are used, instead of weekly or monthly returns, because daily returns are more capable of capturing all possible interactions. The series are transformed into natural logs in order to eliminate any extreme values which may cause the results to be biased. Daily return is calculated as given below:

***Daily Rate of Return = log(Pt/Pt*-1)*100**

where *Pt* is the closing price of today, and

Pt-1 is the closing price of yesterday.

Some journals related to this study were also downloaded from the internet in order to have a deeper understanding about the inter-linkages among stock markets to get an empirical result on testing the hypothesis.

3.4.2 Unit Root Test

There are many unit roots test in testing the data series on the stationary process. In this study, the ADF test (Dickey and Fuller, 1976), PP test (Phillips and Perron, 1988) and the KPSS test (Kwiatkowski-Phillips-Schmidt-Shin, 1992) are used in testing the unit root. The lag lengths of the ADF test are determined by the Akaike's Information Criteria (AIC) (Akaike, 1973). AIC which determines the optimal choice of lag length such that the autocorrelations in the error term may be removed. For the PP test, the lag length is determined by the Newey-West's (Newey and West, 1987). This lag length is to ensure serially uncorrelated residuals.

Model of ADF Test

$$\Delta Y_t = \alpha + \phi Y_{t-1} + \delta T + \sum_{i=2}^{p} \beta_i \Delta y_{t-i-1} + \varepsilon_i$$

$$\Delta Y_t = \alpha + \phi Y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta y_{t-i-1} + \varepsilon_i$$

Where Y_t = variable in period t, t= time trend, ω_t =i.i.d. disturbance with mean 0 and variance σ^2; that is, [ω_t – NI (0, σ^2)].

Model of PP Test

$$\frac{1}{N}\sum_{t=1}^{N}\hat{\varepsilon}_t^2 + \frac{2}{N}\sum_{t=1}^{N}\varpi(s,l)\sum_{t=s+1}^{N}\hat{\varepsilon}_t\hat{\varepsilon}_{t-s}$$

: KHUH LV WUXQFDWLRQ ODJ SDUDPHWHU DQG Z V LV D ZLQGRZ WKDW LV HTXDO WR
1-s/(?+ 1).

Model of KPSS Test

$$X_t = \beta_0 + \beta_1 Y_t + \varepsilon_{x,t}$$

$$Y_t = \beta_0 + \beta_1 Y_t + \varepsilon_{y,t}$$

Unit root test is the most popular way to test whether the data series are stationary. If the data series have unit root, then the data series are non-stationary. The existence of stationary in a time series data indicate that the series have constant variance, constant mean and constant covariance, so the results obtained implied that the existence of a meaningful economic relationship in the regression model. A non-stationary time series does not have long run equilibrium mean value due to each value of observation is go far away from mean; the variance may become larger and larger over the time because the variance is dependent upon time and goes to infinity as the sample period approaches infinity.

There are some problems when using the non-stationary data series in the regression model. If we use the non-stationary data to run the regression, the regression may be a spurious regression problem which is against the assumption of the classical regression model. However, it depends on the residual of the regression. If the residual is stationary, that means the data series are cointegrated. If the residual is non-stationary, it implies that the regression is a spurious problem. Although the outcome is better, it is bias if the spurious regression problem happens. Granger and Newbold (1974) indicated that such estimated 'spurious regression' result: high R2 values and high t-ratios but low Durbin Watson value, means that the results are significant but have no economic meaning.

All the three tests, ADF, PP and KPSS are used in this study in order to ascertain more robust results. For ADF and PP, the null hypothesis is that there is a unit root in the series.

H_0: There is a unit root (Non-stationary).
H_1: There is no unit root (Stationary).

As for KPSS, the null hypothesis is the other way round, i.e., the series are stationary. The ADF and PP tests indicate that the series has a unit root at the log level and using the KPSS test, again the series is shown to be stationary.

3.4.3 Johansen and Juselius test

Having established the same order of integration, the cointegration test was then initiated. A multivariate cointegration technique proposed by Johansen (1988) and Johansen and Juselius (1990) as a system-based reduced-rank regression approach was used to investigate whether there is an existence of any long-run equilibrium relationship(s) among the Malaysia and other trading blocs. The cointegration test was performed first because the results from that test would be used for the following cointegrating vector analysis.

This Johansen and Juselius (1990) test fully captures the underlying time-series of the date. There are some advantages compared to others cointegration test such as Engle and Granger (1987) conintegration test. Firstly, Johansen method tests for all numbers of cointegrating vectors between 2 and more variables based on trace test and maximum eigenvalue test. Secondly, these methods avoid an arbitrary choice of dependent and treat all variables as endogenous variables. Thirdly, it provides a unified framework as an estimate and it tests the cointegration relations within the framework of VECM.

Model of VECM

$$\Delta \mathbf{y}_t = \delta + \Pi \mathbf{y}_{t-1} + \sum_{i=1}^{p-1} \Phi_i^* \Delta \mathbf{y}_{t-i} + \epsilon_t$$

Where Δ is the differencing operator, such that $\Delta Y_t = Y_t - Y_{t-1}$

For this cointegration test, the endogenous variable is Malaysia (KLCI). The result provides essential information about the relationships between Malaysia and other trading blocs. The name of the equity markets and the symbol used for each country are shown in Table 1 below:

Models:

1) **$KLCI = ß0 + ß_1 DJIA_t + ß_2 FTSE_t + ß_3 N225_t + ß_4 SPTSX_t + U_t$**
2) **$KLCI = ß0 + ß_1 KOSPI_t + ß_2 TWSE_t + ß_3 FSSTI_t + ß_4 HSI_t + U_t$**
3) **$KLCI = ß0 + ß_1 AORD_t + ß_2 NZ50_t + U_t$**
4) **$KLCI = ß0 + ß_1 JKSE_t + ß_2 SET_t + ß_3 PSEi_t + ß_4 VNINDEX_t + ß_5 FSSTI_t + U_t$**
5) **$KLCI = ß0 + ß_1 SSEC_t + ß_2 BSESN_t + U_t$**

Where:

KLCI = Daily stock return of KLCI

U_t = Random error term

Daily stock returns for:

1) Developed markets: U.S., U.K., Japan, Canada
2) Tiger markets: South Korea, Taiwan, Singapore, Hong Kong
3) Asia Pacific markets: Australia, New Zealand
4) ASEAN markets: Indonesia, Thailand, Philippines, Vietnam, Singapore
5) Emerging markets: China, India

Table 3.1: Stock indexes

Country	**Name of Equity Indices**	**Symbol**
Malaysia	FTSE Bursa Malaysia KLCI	KLCI
	Model 1 - Developed markets	
U.S.	Dow Jones Industrial Average	DJIA
U.K.	FTSE 100 Index	FTSE
Japan	Nikkei 225	N225
Canada	S&P TSX Composite Index	SPTSX
	Model 2 - Tiger markets	
South Korea	KOSPI Composite Index	KOSPI
Taiwan	Taiwan Taiex Index	TWSE
Singapore	FTSE Straits Times Index	FSSTI
Hong Kong	Hang Seng Index	HSI
	Model 3- Asia Pacific markets	
Australia	All Ordinaries Index	AORD
New Zealand	NZX 50 Gross Index	NZ50
	Model 4 – ASEAN markets	
Indonesia	Jakarta Composite Index	JKSE
Thailand	Stock Exchange of Thai Index	SET
Philippines	Philippine SE Index	PSEi
Vietnam	Ho Chi Minh Stock Index	VNINDEX
Singapore	FTSE Straits Times Index	FSSTI
	Model 5 - Emerging market	
China	SSE Composite	SSEC
India	BSE SENSEX 30	BSESN

3.4.4 Granger-causality test

A cointegration test is conducted first since the results from cointegration serve as inputs to the conduct of the Granger-causality test. The cointegration test, therefore, also serves as a diagnostic test for the Granger-causality test. If cointegration is found, the Granger-causality, VDC and impulse response analyses must be done based on ECM. If no cointegration is found, then the analyses will be based on the regression of the first differences of the variables using a standard VAR model.

Granger causality is part of the VAR model. Granger (1969) defines causality as the degree to which the variable X can explain the behavior of variable Y, and reduce variable Y's conditional variance. It is possible to have causality running from variable X to Y, but not Y to X; from Y to X, but not X to Y and from both Y to X and X to Y. The 'Granger causality' test can also be used as a test for whether a variable is exogenous, i.e. If no variables in a model affect a particular variable it can be viewed as exogenous. In this study, Granger Causality is used to identify the causal linkages between the stock markets that showed in Table 1.

The model of Granger Causality Test

$$Y_t = a_0 + a_1 Y_{t-1} + ... + a_k Y_{t-k} + \beta_1 X_{t-1} + ... + \beta_k X_{t-k}$$

$$X_t = a_0 + a_1 X_{t-1} + ... + a_k X_{t-k} + \beta_1 Y_{t-1} + ... + \beta_k Y_{t-k}$$

3.4.5 Impulses Responses Functions

The IRFs can be used to produce the time path of the dependent variables in the VAR, to shocks from all the explanatory variables. More generally, an impulse response refers to the reaction of any dynamic system in response to some external change. IRF display graphically the expected response of each market to shocks in that market and shocks in the other markets. This function enables characterization of the dynamic interactions among variables and allows us to observe the speed of adjustment of variables in the system.If the system of equations is stable any shock should decline to zero, an unstable system would produce an explosive time path.

3.4.6 Variance Decomposition

This is an alternative method to the IRF for examining the effects of shocks to the dependent variables. This technique determines how much of the forecast error variance for any variable in a system, is explained by innovations to each explanatory variable, over a series of time horizons. Usually own series shocks explain most of the error variance, although the shock will also affect other variables in the system. It is also important to consider the ordering of the variables when conducting these tests, as in practise the error terms of the equations in the VAR will be correlated, so the result will be dependent on the order in which the equations are estimated in the model.

3.5 Conclusion

The study investigates the presence of relationship between the Malaysian market and other trading blocs. This study can provide investors with an analysis that can earn abnormal profit from the stock market. In other words, it might enable the investors to take advantage of relatively regular shift in the market by designing the trading strategies. The investors can create and hold diversified portfolios by investing their funds into the different markets where market cointegration does not exist.

CHAPTER 4
EMPIRICAL RESULTS & DISCUSSIONS

4.1 Introduction

This chapter represents descriptive statistics followed by Unit Root test, cointegration test, Granger Causality, Cumulative Sum Control Chart (CUSUM) test, daily logarithmic returns, IRF and VDC.

4.2 Descriptive Statistics

Descriptive statistics are used to describe basis features, general pattern and trend of the data set. The important function of the descriptive statistic is used for summary of collection of data in a clear way include mean, median, maximum, minimum, standard deviation, skewness, kurtosis, Jarque-Bera and probability. As for the descriptive statistics, the details are given in table 4.1 and 4.2.

4.2.1 Developed Markets

Table 4.1 displays the descriptive statistic for the five investigated trading blocs over the period of January 2000 to October 2010. Japan registered the highest mean of 12789.400 compared to other markets, followed by the U.S. with an average of 10525.290, while Malaysia obtained the lowest mean of 903.226 in the Developed Markets bloc. Japan and the U.S. were higher in mean because they were two of the largest markets in the world, judging by their high volume and level of market efficiency. The volatility of the markets, measured by the standard deviation, had shown the same pattern as the mean, with the largest being Japan, followed by U.S., Canada, U.K. and Malaysia. Skewness is a measure of asymmetry of the distribution of the series around its mean. All the markets indices, with an exception of U.K, stated positive skewness, indicating that the deviations from the mean were going to be positive. Kurtosis measures the peakness or flatness of the distribution of the series. The series are considered normally distributed if kurtosis equals to three. If kurtosis is more than three, the distribution is known as leptokurtic distribution, while for kurtosis of less than three, the distribution is known as platykurtic distribution. In this case, all markets in the Developed Markets bloc exhibited values of less than three, meaning that the distribution is flatter with a wider peak relative to the normal with the indication that the probability for extreme values is less than the one of normal distribution, and the values of indices are wider spread around the mean. Jarque-Bera is a test statistic for testing whether the series is normally distributed. The test statistic measures the difference of the skewness and kurtosis of the series with those from the normal distribution. Under the null hypothesis of a normal distribution, the Jarque-Bera statistic is distributed as with 2 degrees of freedom. The reported Probability was the probability that a Jarque-Bera statistic exceeds the observed value under the null hypothesis, where a small probability value leads to the rejection of the null hypothesis of a normal distribution. The small P-values from table 4.1 indicated that the null hypothesis of normal distribution was rejected.

4.2.2 Tiger Markets

In the Tiger Markets bloc, Hong Kong recorded the highest mean value of 15329.990, followed by Taiwan (6374.046), while Malaysia registered the lowest average of 90.226. These results were also the same in terms of median, maximum, and minimum. Standard deviation measures volatility of the stock markets. A low standard deviation indicates that the data points tend to be very close to the mean, while high standard deviation indicates the date is spread out from the mean or value. The volatility of Malaysia was the lowest, while Hong Kong exhibited the highest volatility. There seems to be positive skewness among the tiger markets, therefore they tend to have right side tails. The kurtosis for all countries had not exceeds three, signifying that the distribution was flatter with thinner tails relative to the normal, which demonstrates that the there is a higher probability that the values are near the mean and lower probability of extreme values compared to a normally distributed one.

4.2.3 Asia Pacific Markets

As table 4.2 below, Australia obtained the highest average of 4068.827, followed by New Zealand (2887.467), while the lowest mean of 903.226 was obtained by Malaysia. This is because the Malaysian market is smaller compared to Australia and New Zealand in terms of volume and market capitalisation. Standard deviation is a measure of dispersion or spread in the series where similar to the mean, Australia recorded the highest, followed by New Zealand and Malaysia being the lowest. Positive skewness for all countries indicated that the tail on the right side is longer than the left side and the bulk of the values lie to the left side of the mean. In the Kurtosis test, all the countries had not exceed three, meaning the distribution is flatter with thinner tails (platykurtic) relative to the normal, which means compared to normal distribution, there is a higher probability of values near the mean and lower probability of extreme values.

4.2.4 ASEAN Markets

In table 4.2, Singapore obtained the highest average of 2131.882 followed by 1939.741 of Philippines, while Vietnam registered the lowest mean of 406.794 followed by Thailand of 555.7433. In terms of volatility, Philippines caught the highest standard deviation of 726.215, followed by Indonesia (711.128) while

Thailand recorded the lowest volatility of 184.041. All the countries were positively skewed except for the Thailand; therefore the distribution tends to be tailed to the right. In the kurtosis test, if normally distribution, the figure will be equivalent to three. In this bloc, Vietnam is the only country where the value of kurtosis exceeds three, while other countries remained below three. Vietnam having a leptokurtic distribution, with a higher peak and heavier tail, had a lower probability of values near the mean and higher probability of extreme values compared to normal distribution. The other countries which have platykurtic distribution with wider peak and thinner tails will more probably have wider spread of values around the mean and less extreme values.

4.2.5 Emerging Markets

Based on the descriptive statistic table 4.2 of the Emerging Markets, India exhibited the highest mean compared to China, while Malaysia caught the lowest mean of 903.2257. All in all, Malaysia seemed to have the lowest volatility among the four blocs of market except for the ASEAN markets while India had the highest volatility among emerging markets. Positive values for all the countries indicate that all three countries have positive skewness with a tail skewed to the right. In the kurtosis test, China had exceeded three (6.243), having a leptokurtic distribution indicating lower probability of values near the mean and higher probability of extreme values in China's index, while Malaysia (2.895) and India (2.469) having platykurtic distribution, signifies wider spread of values around the mean and lesser probability for extreme values compared to normal distribution.

Table 4.1: Descriptive Statistics

		Developed Markets				Tiger Markets			
Details	MALAYSIA	US	UK	JAPAN	CANADA	SOUTH KOREA	TAIWAN	SINGAPORE	HONG KONG
Mean	903.226	10525.290	5274.078	12789.400	9790.659	1047.100	6374.046	2131.882	15329.990
Median	884.180	10522.330	5314.800	11891.610	9211.800	907.430	6060.460	2003.660	14408.940
Maximum	1516.220	14164.530	6798.100	20833.210	15073.130	2064.850	10202.200	3831.190	31638.220
Minimum	553.340	6547.050	3287.000	7054.980	5695.330	468.760	3446.260	1170.850	8409.010
Std. Dev.	217.904	1466.532	883.972	3160.475	2399.638	406.790	1475.521	615.673	4592.111
Skewness	0.777	0.157	-0.146	0.351	0.453	0.603	0.543	0.822	0.969
Kurtosis	2.895	2.861	1.737	2.090	2.009	2.263	2.521	2.855	3.597
Jarque-Bera	240.147	11.708	166.286	130.778	178.393	197.795	139.544	269.564	406.976
Probability	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 4.2: Descriptive Statistics

	Asia Pacific Markets		ASEAN Markets					Emerging Markets	
Details	AUSTRALIA	NEW ZEALAND	INDONESIA	THAILAND	PHILIPPINES	VIETNAM	SINGAPORE	INDIA	CHINA
Mean	4068.827	2887.467	1114.677	555.743	1939.741	406.794	2131.882	7898.566	2043.692
Median	3495.600	2952.020	939.151	621.950	1807.490	311.720	2003.660	5880.350	1670.670
Maximum	6853.600	4333.240	2830.263	915.030	3873.500	1170.670	3831.190	20873.330	6092.060
Minimum	2673.280	1665.040	337.475	250.600	979.340	100.000	1170.850	2600.120	1011.500
Std. Dev.	1095.854	741.782	711.128	184.041	726.215	255.486	615.673	4758.927	1043.254
Skewness	0.871	0.128	0.752	-0.108	0.847	1.279	0.822	0.821	1.976
Kurtosis	2.448	1.909	2.296	1.561	2.810	3.884	2.855	2.469	6.243
Jarque-Bera	330.744	124.362	272.981	209.434	287.286	725.164	269.564	294.447	2586.455
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Figure 4.1: Developed Markets

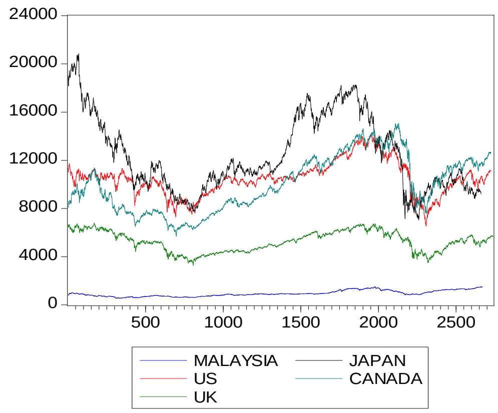


Figure 4.2: Tiger Markets

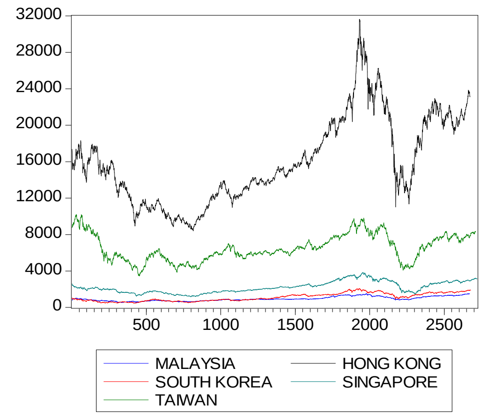


Figure 4.3: Asia Pacific Markets

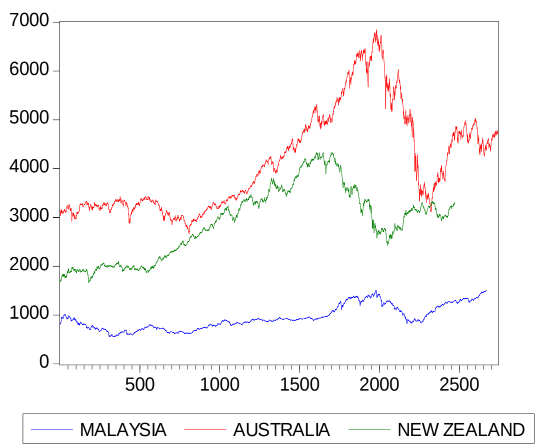


Figure 4.4: ASEAN Markets

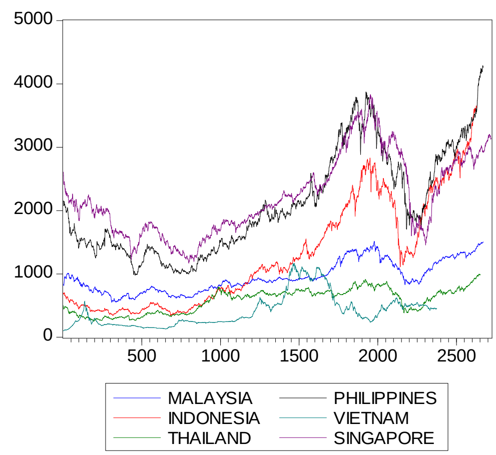
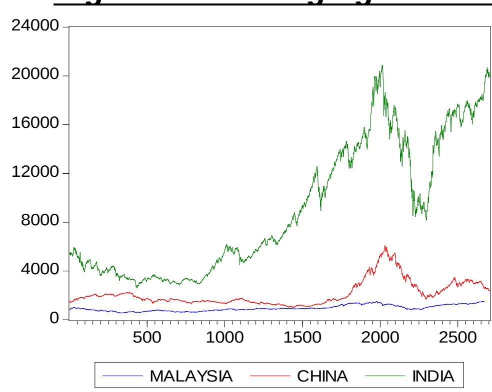


Figure 4.5: Emerging Markets



4.3 Unit Root Test

Three types of stationarity test were used; ADF, PP and KPSS. The results of the tests are shown in the tables below. In the case of ADF and PP, we failed to reject the null hypothesis of non-stationarity at level including intercept and intercept and trend. KPSS test showed consistent results as we rejected the null hypothesis of stationarity at level under intercept and intercept and trend. Besides that, the stationarity test on residual will be another important step in moving forward for cointegration testing. The results were very consistent between ADF and PP, thus, the residual was stationary or I(0) as given in the Table 4.3, 4.4, 4.5, 4.6 and 4.7 below. This allowed us to proceed for cointegration test.

Table 4.3: Stationary test on Indices at level for Developed Markets

Developed Markets		ADF	PP	KPSS
Malaysia	Intercept	0.00455	-0.03284	**4.57008****
	Intercept and trend	-1.85785	-1.89259	**0.34439****
U.S	Intercept	-2.04107	-2.13585	**0.88523****
	Intercept and trend	-2.15845	-2.26542	**0.50079****
U.K	Intercept	-1.99291	-2.26431	**0.63172****
	Intercept and trend	-1.97244	-2.19012	**0.64882****
Japan	Intercept	-2.09241	-2.04588	**0.64953****
	Intercept and trend	-2.02219	-1.96961	**0.65270****
Canada	Intercept	-1.30503	-1.17916	**3.66678****
	Intercept and trend	-1.92055	-1.77565	**0.57411****
Residual	None	**-3.18378****	**-3.18378****	-

Table 4.4: Stationary test on Indices at level for Tiger Markets

Tiger Markets		ADF	PP	KPSS
Malaysia	Intercept	0.00455	-0.03284	**4.57008****
	Intercept and trend	-1.85785	-1.89259	**0.34439****

South Korea	Intercept	-0.42957	-0.40357	**5.32113****
	Intercept and trend	-3.05833	-3.04685	**0.39784****
Taiwan	Intercept	-1.93989	-2.02104	**1.34578****
	Intercept and trend	-2.51067	-2.56630	**0.41024****
Hong Kong	Intercept	-1.11246	-1.14703	**3.53944****
	Intercept and trend	-2.17490	-2.41414	**0.54555****
Singapore	Intercept	-0.88060	-0.90039	**3.52784****
	Intercept and trend	-2.45110	-2.46046	**0.46857****
Residual	None	**-4.45662****	**-4.45662****	-

Table 4.5: Stationary test on Indices at level for Asia Pacific Markets

Asia Pacific Markets		ADF	PP	KPSS
Malaysia	Intercept	0.00455	-0.03284	**4.57008****
	Intercept and trend	-1.85785	-1.89259	**0.34439****
Australia	Intercept	-1.28595	-1.24355	**3.79949****
	Intercept and trend	-1.47398	-1.40708	**0.65002****
New Zealand	Intercept	-1.54002	-1.58574	**3.76301****
	Intercept and trend	-1.04113	-1.10857	**1.09881****
Residual	None	**-1.99293***	**-1.99293***	-

Table 4.6: Stationary test on Indices at level for ASEAN Markets

ASEAN Markets		ADF	PP	KPSS
Malaysia	Intercept	0.00455	-0.03284	**4.57008****
	Intercept and trend	-1.85785	-1.89259	**0.34439****
Indonesia	Intercept	1.54136	1.62994	**5.46222****
	Intercept and trend	-1.25734	-1.23446	**0.48572****
Thailand	Intercept	-0.22638	-0.32738	**4.10336****
	Intercept and trend	-1.82557	-1.91367	**0.65069****
Philippines	Intercept	0.49002	0.61964	**4.65160****
	Intercept and trend	-2.03647	-1.93733	**0.44436****
Vietnam	Intercept	-1.52047	-1.62431	**2.51264****
	Intercept and trend	-1.37179	-1.51837	**0.50668****
Singapore	Intercept	-0.88060	-0.90039	**3.52784****
	Intercept and trend	-2.45110	-2.46046	**0.46857****
Residual	None	**-5.76822***	**-5.79891***	-

Table 4.7: Stationary test on Indices at level for Emerging Markets

Emerging Markets		ADF	PP	KPSS
Malaysia	Intercept	0.00455	-0.03284	**4.57008****
	Intercept and trend	-1.85785	-1.89259	**0.34439****
China	Intercept	-1.27250	-1.30945	**2.30459****
	Intercept and trend	-1.27759	-1.32492	**0.54197****
India	Intercept	0.01714	0.06746	**5.57960****
	Intercept and trend	-2.38407	-2.29495	**0.53879****
Residual	None	**-3.49748****	**-3.49748****	-

*(**) denotes rejection of the hypothesis at 5% (1%) significance level.

4.4 Cointegration Test

Two tests have been suggested in determining cointegration rank; λ_{max} and λ_{trace} (Johansen, 1988; Johansen and Juselius, 1990) for multivariate analysis. The details of the results are given in Table 4.8, 4.9, 4.10, 4.11 and 4.12 below.

Table 4.8: Johansen and Juselius Cointegration test for Developed Markets

Developed Market				
Null Hypothesis	λ Max	5%	λTrace	5%
Lag Length=1	AIC=56.78777		BIC=56.87631	
r=0	83.62232*	33.87687	142.32590*	69.81889
R<1	30.33724*	27.58434	58.70354*	47.85613
R<2	23.56315*	21.13162	28.36630	29.79707
R<3	4.75633	14.26460	4.80315	15.49471
R<4	0.04682	3.84147	0.04682	3.84147
Lag Length=2	AIC=56.77082		56.91474	
r=0	75.82627*	33.87687	127.02990*	69.81889
R<1	26.23531	27.58434	51.20367*	47.85613
R<2	20.49757	21.13162	24.96836	29.79707
R<3	4.45534	14.26460	4.47078	15.49471

R<4	0.01544	3.84147	0.01544	3.84147
Lag Length=3	AIC=56.69611		BIC=56.89545	
r=0	55.14252*	33.87687	102.70020*	69.81889
R<1	25.69193	27.58434	47.55769	47.85613
R<2	17.55794	21.13162	21.86575	29.79707
R<3	4.28803	14.26460	4.30781	15.49471
R<4	0.01978	3.84147	0.01978	3.84147
Lag Length=4	AIC=56.66582		BIC=56.92061	
r=0	54.40888*	33.87687	100.55170*	69.81889
R<1	26.00095	27.58434	46.14285	47.85613
R<2	15.49888	21.13162	20.14190	29.79707
R<3	4.63816	14.26460	4.64302	15.49471
R<4	0.00486	3.84147	0.00486	3.84147
Lag Length=5	AIC=56.66198		BIC=56.97226	
r=0	54.09234*	33.87687*	96.21216	69.81889
R<1	24.27778	27.58434	42.11983	47.85613
R<2	13.60147	21.13162	17.84205	29.79707
R<3	4.23906	14.26460	4.24058	15.49471
R<4	0.00152	3.84147	0.00152	3.84147
Lag Length=6	AIC=56.65130		BIC=57.01710	
r=0	52.69117*	33.87687	92.58507*	69.81889
R<1	22.50647	27.58434	39.89390	47.85613
R<2	13.15594	21.13162	17.38743	29.79707
R<3	4.22148	14.26460	4.23149	15.49471
R<4	0.01001	3.84147	0.01001	3.84147
Lag Length=7	AIC=56.64738		BIC=57.06874	
r=0	51.70817*	33.87687	87.80340*	69.81889
R<1	18.97193	27.58434	36.09523	47.85613
R<2	13.13989	21.13162	17.12330	29.79707
R<3	3.96197	14.26460	3.98341	15.49471
R<4	0.02144	3.84147	0.02144	3.84147
Lag Length=8	AIC=56.65244		BIC=57.12939	
r=0	54.17256*	33.87687	91.52802*	69.81889
R<1	19.30957	27.58434	37.35546	47.85613
R<2	13.70841	21.13162	18.04589	29.79707
R<3	4.31321	14.26460	4.33747	15.49471
R<4	0.02427	3.84147	0.02427	3.84147
Lag Length=9	**AIC=56.64628***		BIC=57.17885	
r=0	**52.26000***	**33.87687**	**86.98337***	**69.81889**
R<1	**17.62293**	**27.58434**	**34.72337**	**47.85613**
R<2	**12.76183**	**21.13162**	**17.10044**	**29.79707**
R<3	**4.28295**	**14.26460**	**4.33861**	**15.49471**
R<4	**0.05566**	**3.84147**	**0.05566**	**3.84147**

The results show that there is evidence that one cointegration exists among the indices (under both techniques) as the null hypothesis of no cointegration vector hypothesis (r=0) is rejected at 5 percent significance level using lag 9. Lag 9 is chosen because it has the lowest AIC compared to other lags.

Table 4.9: Johansen and Juselius Cointegration test for Tiger Markets

Tiger Market				
Null Hypothesis	λ Max	5%	λ Trace	5%
Lag Length=1	AIC=51.74605		**BIC=51.83434***	
r=0	**69.58613***	**33.87687**	**146.79380***	**69.81889**
R<1	**34.74072***	**27.58434**	**77.20772***	**47.85613**
R<2	**28.35424***	**21.13162**	**42.46700***	**29.79707**
R<3	**13.70947**	**14.26460**	**14.11276**	**15.49471**
R<4	**0.40329**	**3.84147**	**0.40329**	**3.84147**
Lag Length=2	AIC=51.70822		BIC=51.85174	
r=0	62.97334*	33.87687	133.07350*	69.81889
R<1	32.26813*	27.58434	70.10014*	47.85613
R<2	24.74901*	21.13162	37.83201*	29.79707
R<3	12.63424	14.26460	13.08300	15.49471
R<4	0.44877	3.84147	0.44877	3.84147
Lag Length=3	AIC=51.70327		BIC=51.90206	
r=0	64.14150*	33.87687	135.15400*	69.81889
R<1	34.63355*	27.58434	71.01253*	47.85613
R<2	22.66563*	21.13162	36.37898*	29.79707
R<3	13.26886	14.26460	13.71335	15.49471
R<4	0.44449	3.84147	0.44449	3.84147
Lag Length=4	AIC=51.67574		BIC=51.92982	
r=0	64.62986*	33.87687	133.51630*	69.81889
R<1	36.58074*	27.58434	68.88649*	47.85613
R<2	19.40686	21.13162	32.30575*	29.79707
R<3	12.42561	14.26460	12.89889	15.49471
R<4	0.47329	3.84147	0.47329	3.84147
Lag Length=5	AIC=51.65670		BIC=51.96611	
r=0	67.77820*	33.87687	131.78640*	69.81889
R<1	35.30023*	27.58434	64.00822*	47.85613
R<2	16.67305	21.13162	28.70800	29.79707
R<3	11.52230	14.26460	12.03495	15.49471
R<4	0.51265	3.84147	0.51265	3.84147
Lag Length=6	AIC=51.65498		BIC=52.01976	
r=0	62.92121*	33.87687	123.74450*	69.81889

R<1	33.69636*	27.58434	60.82326*	47.85613
R<2	15.33838	21.13162	27.12690	29.79707
R<3	11.33277	14.26460	11.78852	15.49471
R<4	0.45575	3.84147	0.45575	3.84147
Lag Length=7	AIC=51.64110		BIC=52.06127	
r=0	60.77852*	33.87687	123.06880*	69.81889
R<1	34.96296*	27.58434	62.29031*	47.85613
R<2	16.42399	21.13162	27.32736	29.79707
R<3	10.57203	14.26460	10.90337	15.49471
R<4	0.33135	3.84147	0.33135	3.84147
Lag Length=8	AIC=51.64211		BIC=52.11772	
r=0	57.90962*	33.87687	122.27180*	69.81889
R<1	36.93295*	27.58434	64.36221*	47.85613
R<2	16.26711	21.13162	27.42926	29.79707
R<3	10.88076	14.26460	11.16215	15.49471
R<4	0.28139	3.84147	0.28139	3.84147
Lag Length=9	AIC=51.64393		BIC=52.17501	
r=0	56.24563*	33.87687	119.55140*	69.81889
R<1	36.43419*	27.58434	63.30579*	47.85613
R<2	15.23438	21.13162	26.87160	29.79707
R<3	11.34212	14.26460	11.63722	15.49471
R<4	0.29510	3.84147	0.29510	3.84147

The results show that there is evidence that three cointegrations exist among the indices (under both techniques) as the null hypothesis of no cointegration vector hypothesis (r=0) is rejected at 5 percent significance level using lag 1. Lag 1 is chosen because it has the lowest BIC compared to other lags. In this case, BIC has been chosen instead of AIC because Bayesian information criterion (BIC) offers better stability based on CUSUM test.

Table 4.10: Johansen and Juselius Cointegration test for Asia Pacific Markets

Asia Pacific				
Null Hypothesis	λ Max	5%	λ Trace	5%
Lag Length=1	AIC=26.78253		BIC=26.82488	
r=0	25.22319*	21.13162	38.27901*	29.79707
r<1	8.18587	14.26460	13.05582	15.49471
r<2	4.23996*	3.84147	4.23996*	3.84147
Lag Length = 2	AIC=26.78223		BIC=26.84578	

r=0	28.39410*	21.13162	42.03314*	29.79707
r<1	9.60091	14.26460	13.63904	15.49471
r<2	4.03813*	3.84147	4.03813*	3.84147
Lag Length = 3	AIC=26.78145		BIC=26.86622	
r=0	27.10689*	21.13162	40.29034*	29.79707
r<1	9.01657	14.26460	13.18345	15.49471
r<2	4.16688*	3.84147	4.16688*	3.84147
Lag Length = 4	AIC=26.78114		BIC=26.88713	
r=0	25.36542*	21.13162	38.26521*	29.79707
r<1	8.51259	14.26460	12.89979	15.49471
r<2	4.38719*	3.84147	4.38719*	3.84147
Lag Length = 5	**AIC=26.78004***		BIC=26.90727	
r=0	**25.07893***	**21.13162**	**37.65415***	**29.79707**
r<1	**7.91783**	**14.26460**	**12.57522**	**15.49471**
r<2	**4.65739***	**3.84147**	**4.65739***	**3.84147**
Lag Length = 6	AIC=26.78327		BIC=26.93176	
r=0	25.64463*	21.13162	38.75641*	29.79707
r<1	8.29786	14.26460	13.11178	15.49471
r<2	4.81393*	3.84147	4.81393	3.84147

The results show that there is evidence that one cointegrations exist among the indices (under both techniques) as the null hypothesis of no cointegration vector hypothesis (r=0) is rejected at 5 percent significance level using lag 5. Lag 5 is chosen because it has the lowest AIC compared to other lags.

Table 4.11: Johansen and Juselius Cointegration test for ASEAN Markets

Asean Market				
Null Hypothesis	λ Max	5%	λ Trace	5%
Lag Length=1	AIC=49.96211		BIC=50.09346	
r=0	86.24002*	40.07757	190.33110*	95.75366
R<1	53.05889*	33.87687	104.09100*	69.81889
R<2	35.41067*	27.58434	51.03214*	47.85613
R<3	10.51218	21.13162	15.62147	29.79707
R<4	4.46784	14.26460	5.10929	15.49471
R<5	0.64146	3.84147	0.64146	3.84147
Lag Length=2	**AIC=49.94849**		BIC=50.16748	

r=0	**75.10599***	**40.07757**	**176.49560***	**95.75366**
R<1	**52.31276***	**33.87687**	**101.38960***	**69.81889**
R<2	**33.38933***	**27.58434**	**49.07687***	**47.85613**
R<3	**11.24175**	**21.13162**	**15.68754**	**29.79707**
R<4	**3.78264**	**14.26460**	**4.44578**	**15.49471**
R<5	**0.66314**	**3.84147**	**0.66314**	**3.84147**
Lag Length=3	AIC=49.95436		BIC=50.26105	
r=0	66.99963	40.07757	168.76530	95.75366
R<1	52.52988	33.87687	101.76560	69.81889
R<2	33.90118	27.58434	49.23575	47.85613
R<3	11.11610	21.13162	15.33457	29.79707
R<4	3.65322	14.26460	4.21847	15.49471
R<5	0.56525	3.84147	0.56525	3.84147
Lag Length=4	AIC=49.94894		BIC=50.34339	
r=0	62.35643	40.07757	167.12880	95.75366
R<1	56.63906	33.87687	104.77240	69.81889
R<2	33.17255	27.58434	48.13350	47.85613
R<3	10.46808	21.13162	14.96080	29.79707
R<4	4.09005	14.26460	4.49272	15.49471
R<5	0.40267	3.84147	0.42668	3.84147

The results show that there is evidence that three cointegrations exist among the indices (under both techniques) as the null hypothesis of no cointegration vector hypothesis (r=0) is rejected at 5 percent significance level using lag 2. Lag 2 is chosen because it has the lowest AIC compared to other lags.

Table 4.12: Johansen and Juselius Cointegration test for Emerging Markets

Emerging Market				
Null Hypothesis	λ Max	5%	λ Trace	5%
Lag Length=1	AIC=30.99157		BIC=31.03130	
R=0	44.08719*	21.13162	62.38477*	29.79707
R<1	16.99656*	14.26460	18.29758*	15.49471
R<2	1.30102	3.84147	1.30102	3.84147
Lag Length=2	AIC=30.98979		BIC=31.04941	
R=0	46.37316*	21.13162	64.73168*	29.79707
R<1	17.00445*	14.26460	18.35852*	15.49471
R<2	1.35406	3.84147	1.35406	3.84147
Lag Length=3	AIC=30.98663		BIC=31.06614	
R=0	43.59823*	21.13162	61.47599*	29.79707

R<1	16.78465*	14.26460	17.87776*	15.49471
R<2	1.09311	3.84147	1.09311	3.84147
Lag Length=4	AIC=30.98427		BIC=31.08369	
R=0	42.06700*	21.13162	60.23504*	29.79707
R<1	17.18497*	14.26460	18.16805*	15.49471
R<2	0.98308	3.84147	0.98308	3.84147
Lag Length=5	AIC=30.97692		BIC=31.09626	
R=0	42.18906*	21.13162	60.11281*	29.79707
R<1	16.81542*	14.26460	17.92375*	15.49471
R<2	1.10833	3.84147	1.10833	3.84147
Lag Length=6	AIC=30.97494		BIC=31.11421	
R=0	45.64550*	21.13162	62.60890*	29.79707
R<1	15.93948*	14.26460	16.96339*	15.49471
R<2	1.02392	3.84147	1.02392	3.84147
Lag Length=7	AIC=30.97444		BIC=31.13367	
R=0	43.58614*	21.13162	61.53689*	29.79707
R<1	16.86236*	14.26460	17.95075*	15.49471
R<2	1.08839	3.84147	1.08839	3.84147
Lag Length=8	**AIC=30.97319***		BIC=31.15238	
R=0	**43.47210***	**21.13162**	**62.65913***	**29.79707**
R<1	**17.94848***	**14.26460**	**19.18703***	**15.49471**
R<2	**1.23855**	**3.84147**	**1.23855**	**3.84147**
Lag Length=9	AIC=30.07814		BIC=31.17729	
R=0	43.82539*	21.13162	63.40841*	29.79707
R<1	18.39073*	14.26460	19.58302*	15.49471
R<2	1.19230	3.84147	1.19230	3.84147

The results show that there is evidence that two cointegrations exist among the indices (under both techniques) as the null hypothesis of no cointegration vector hypothesis (r=0) is rejected at 5 percent significance level using lag 8. Lag 8 is chosen because it has the lowest AIC compared to other lags.

In summary, the results show that there are evidences that cointegrations exist among all the five blocs. This indicates that there is long run relationship between the Malaysian stock markets and the five trading blocs undertaken.

The cointegrating indices should have an error correction representation. We would be able to detect the direction of the Granger Causality relationship by furthering the analysis using the VECM approach. The adoption of the right

VECM is dependent on the AIC or BIC criteria in line with the number of lags being considered here.

4.5 Granger Causality

Granger causality is used to determine whether short-run relationships exist between each of the markets in the five selected trading blocs. Table 4.13 to Table 4.17 provides a clear picture of which market causes and is caused by the others. It is important to note that the null hypothesis of Granger Causality is that there is no granger causality and the rejection of null hypothesis means that relationship exists between the stock markets.

Table 4.13: Granger Causality test for Developed Markets

Developed Markets					
Causes → Caused by	Malaysia	U.S.	U.K.	Japan	Canada
Malaysia	-	8.997082	12.88621	**20.16476****	11.10936
U.S.	**15.92491***	-	**25.69390*****	5.956560	**366.7552*****
U.K.	7.407100	**22.24394*****	-	6.059153	**22.6647*****
Japan	**19.19842****	11.58335	7.413222	-	9.272782
Canada	**20.82867****	**19.23821****	**62.43420*****	**17.73323****	-
Note: * Rejection of Granger non-causality at 10% significant level. ** Rejection of Granger non-causality at 5% significant level. *** Rejection of Granger non-causality at 1% significant level.					

In the developed markets bloc, strong bidirectional causality was found between Malaysia and Japan. This result is supported by Yusof & Majid (2006) and Mukherjee and Bose (2008). Earlier studies also indicated that the Malaysian government had taken any development in the Japanese economy into consideration in designing policies pertaining to the Malaysian stock market. Notably, the U.S. and U.K. had two-way causality relationship at a one percent level of significance. Other than that, U.S which known as the lodestar of global equity markets, rejects the null hypothesis indicating that

U.S. have a causal effect on at a 10 percent level of significance, approximate to five percent level as p-value is close to 0.0685. Canada however, seems to have effect towards Malaysia and all the developed markets. The null hypothesis was rejected on Malaysia, U.S. and Japan at a five percent significance level and U.K. at a one percent significance level. While U.S. and U.K. had bidirectional causality due to the same economic background and close geographical links, it is interesting to note that Canada seems to have more effect on developed markets compared to the U.S. The claim made by Wong et al (2004) that Malaysia has no relationship with U.S. and U.K. was proven from the results.

Table 4.14: Granger Causality test for Tiger Markets

Tiger Markets					
Causes → Caused by	Malaysia	Hong Kong	South Korea	Singapore	Taiwan
Malaysia	-	**15.99350*** **	**45.46243*** **	0.441301	0.151619
Hong Kong	2.026040	-	**6.774703*** **	**2.767867***	0.005081
South Korea	**8.038597*** **	**23.47630*** **	-	**3.476919***	0.017497
Singapore	0.096124	1.004790	**3.634550***	-	0.004215
Taiwan	0.228543	0.353077	1.772941	1.491657	-

Note: * Rejection of Granger non-causality at 10% significant level.
** Rejection of Granger non-causality at 5% significant level.
*** Rejection of Granger non-causality at 1% significant level.

In the Tiger markets bloc, it can be seen that Malaysia had unilateral impact towards Hong Kong, a result obtained by a study conducted by Awokuse, Chopra, & Bessler (2008). This indicated that Hong Kong had become increasingly sensitive towards the market dynamics of Malaysia. One reason can be because Hong Kong has significant investments in Malaysia while Malaysia does not have the same in Hong Kong. Therefore, when Malaysia faces changes, Hong Kong will be directly affected but Malaysia will not be affected if there is any change in Hong Kong. Besides, Malaysia also has a causal effect on South Korea at one percent significance level. Hong Kong impacts South Korea and Singapore at one percent significance level and ten percent significance level respectively. Other than that, South Korea seems to have relationship with all the tiger markets except for Taiwan; it is significant at one percent for Malaysia and Hong Kong, while for Singapore, the null hypothesis is rejected at a ten percent significance level, approximately close to five percent level of significance as p-value is 0.0622. Singapore also affects South Korea at a ten percent significance level, approximately close to five percent with a p-value of 0.0566. There seems to be two-way causality between South Korea and Malaysia, and Hong Kong and Singapore. This may be due to the fact that South Korea has significant investments in Malaysia and the two tiger markets and vice versa. Any occurrence of special events in South Korea will have impact on Malaysia, Hong Kong and Singapore and South Korea will also be affected if there were any changes in the three countries. The result of Singapore not affecting Malaysia seems to contrast with many previous studies, which showed that Singapore has a great impact on Malaysia. However, it seems consistent with the result of the study conducted by Ng (2002), who found the Malaysian market to be slowly going out of its close linkage with Singapore. Taiwan, on the other hand, has no impact on or being affected by any of the markets in the trading bloc.

Table 4.15: Granger Causality test for Asia Pacific Markets

Asia Pacific Markets			
Causes → Caused by	Malaysia	Australia	New Zealand
Malaysia	-	**12.96114****	**10.03667***
Australia	2.348100	-	4.878017
New Zealand	6.695921	7.412188	-
Note: * Rejection of Granger non-causality at 10% significant level. ** Rejection of Granger non-causality at 5% significant level. *** Rejection of Granger non-causality at 1% significant level.			

In the Asia Pacific markets bloc, Malaysia has unilateral influence on Australia at a five percent significance level and on New Zealand at ten percent. This may be supported by the fact that Australia and New Zealand having invested significant fund through manufacturing and services sector in Malaysia and therefore making large contribution towards the Malaysian economy. As a result, if anything goes wrong in Malaysia, the Australian and New Zealand market will definitely be affected. There seems to be no causal relationship between Australia and New Zealand.

Table 4.16: Granger Causality test for ASEAN Markets

ASEAN Markets						
Causes → Caused by	Malaysia	Indonesia	Thailand	Philippines	Vietnam	Singapore
Malaysia	-	0.574339	**6.527609****	0.123768	2.759609	0.181879
Indonesia	2.724156	-	**4.656571***	**7.105344****	0.779418	**5.843159***
Thailand	**12.23802*****	0.393409	-	**8.773316****	1.037929	0.051872
Philippines	0.907696	**6.367600****	2.765098	-	2.587325	2.937301
Vietnam	0.696804	3.647082	9.506567	0.655342	-	0.890947
Singapore	1.540028	0.875645	0.903787	2.567434	3.425229	-

Note: * Rejection of Granger non-causality at 10% significant level.
** Rejection of Granger non-causality at 5% significant level.
*** Rejection of Granger non-causality at 1% significant level.

In the ASEAN markets bloc, there is a bilateral causal relationship between Malaysia and Thailand. Malaysia has a smaller influence on Thailand at a five percent significance level while Thailand has a more significant effect on Malaysia at a one percent level. A two-way cause-effect relationship also exists between Indonesia and Philippines, both at five percent significance level. Malaysia and Thailand, and Indonesia and Philippines, seems to have the same background and close geographical links, therefore their relationships are bidirectional. In addition, Thailand and Indonesia affects Philippines at a five percent significance level. Apart from that, Indonesia also has a causal relationship with Thailand at a ten percent level of significance. From the test conducted, Vietnam and Singapore do not have any causal effect on all the ASEAN markets.

Table 4.17: Granger Causality test for Emerging Markets

Emerging Markets			
Causes → Caused by	Malaysia	China	India
Malaysia	-	**19.79381****	6.519762
China	11.94909	-	**17.93257****
India	2.321836	12.22326	-
Note: * Rejection of Granger non-causality at 10% significant level; ** Rejection of Granger non-causality at 5% significant level; *** Rejection of Granger non-causality at 1% significant level.			

In the Emerging markets bloc, Malaysia has a strong influence on China at a five percent significance level. Besides that, China has a unilateral causal relationship with India at a five percent significance level. This is because India has significant investment in China. Overall, there is only one-way cause-effect relationship. As far as India was concerned, based on the earlier study of Mukherjee and Bose (2008), up to mid-2005, it was found that the Indian stock market certainly did not function in relative isolation from the rest of Asia after the Asian financial crisis.

4.6 CUSUM Test

As to further our analysis to Generalized Impulse Response Function (GIRF) and VDC, a stability test was considered to check on the best VECM sample based on the best lags using the CUSUM test which statistically supports the linear stability on transformed data as given in Figure 4.6 to Figure 4.10 below. This can be done by including Malaysia as dependant variable and other markets in each of the trading blocs as independent variables, together with the use of the Ordinary Least Squares (OLS) approach. As it enhances the robustness of the findings in VECM, we can conclude that our prediction via GIRF and VDC would offer more insights.

Figure 4.6: CUSUM test for Developed Markets

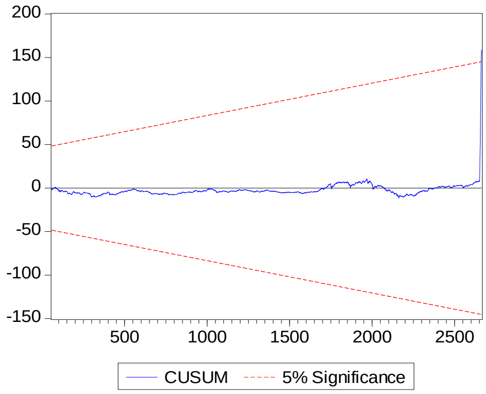


Figure 4.7: CUSUM test for Tiger Markets

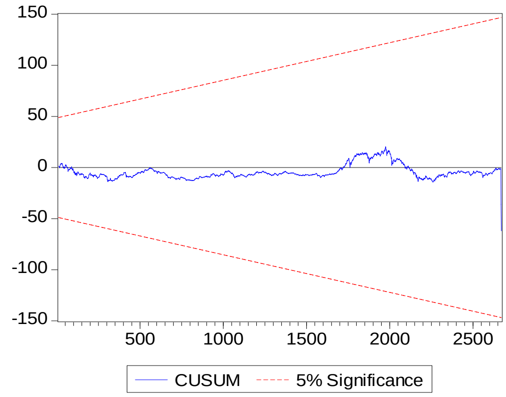


Figure 4.8: CUSUM test for ASEAN Markets

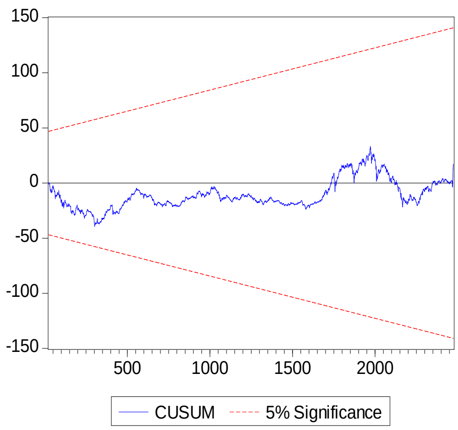


Figure 4.9: CUSUM test for Asia Pacific Markets

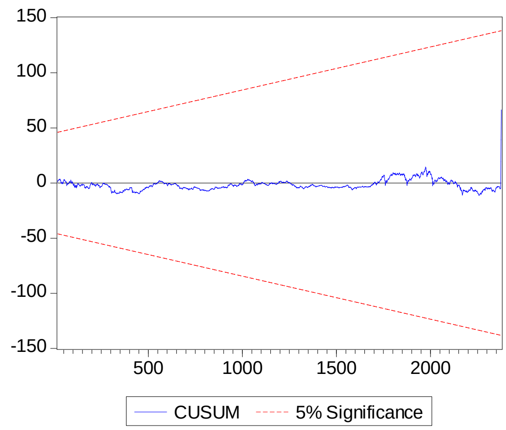
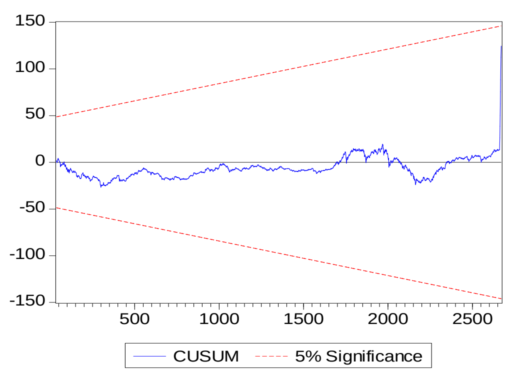


Figure 4.10: CUSUM test for Emerging Markets



4.7 Daily Log Return

The Figure 4.11 to Figure 4.17 below exhibits Daily Rate of Return (logarithmic returns) of Developed Markets, Tiger Markets, Asia Pacific Markets, ASEAN Markets and Emerging Markets.

4.7.1 Developed markets

Developed markets appeared to have the same trend with Malaysia starting from January, 2002 to December 2007. In January 2008 to January 2010, the log returns for U.K. and U.S. was found to be moving in an opposite direction, with U.S. reaching the highest log return of about 4.5 percent, and U.K., the lowest log return of -4 percent. This result was found to be interesting and therefore comparisons of the standard deviations and returns are made for both U.K. and U.S. to see whether they move in line with the concept of “high risk, high return”.

4.7.1.1 Standard deviation for U.K.

Chiang and Doong (2001) provided a direct test of the relationship between excess returns and volatility. They found that market excess returns are positively related to the expected volatility of stock returns, but negatively related to the unexpected volatility of stock returns. They further investigated on whether the theory of high average returns appears to be associated with a higher level of volatility. However, our study seems to contrast with the previous study because standard deviation of U.K. was about 3 percent, but it caught the lowest return of around negative 4 percent. This was because the British government has tightened their criteria for mortgage lending and therefore interest rate is lower than before.

4.7.1.2 Standard deviation for U.S.

The theory of high risk, high return did exist for the case of U.S., where the standard deviation and rate of return of U.S. seems to obtain the highest approximately to 4 percent. It happens on the event of U.S. subprime crisis 2008.

4.7.2 Tiger markets

In the tiger markets bloc, South Korea seem to have the lowest return compared to the others in early 2000 at about -4 percent. However, it became the market with the highest return in January 2002. On the other hand, Taiwan, Singapore, Malaysia, Hong Kong and Taiwan seem to have near to zero returns from 2002 to 2010. In 2008, Singapore and Taiwan moved in an opposite direction with Singapore having the highest return and Taiwan with the lowest. This is the evidence of high volatility of risk resulting in high returns of investment.

4.7.3 Asia Pacific markets

For Asia pacific markets, all the countries seem to move quite consistently until December 2007. Starting from 2008, Australia starts to move in an opposite direction with Malaysia and New Zealand, showing the lowest return of about -2 percent. U.S. sub-prime loan crisis had greater impact on the Australian market, thus Australian central bank had tighten their criteria for borrowing the mortgage loan in response and therefore achieving the lowest rate of return.

4.7.4 ASEAN markets

Early study had shown that there were bidirectional (two-way linkage) between Thailand and Indonesia. This is consistent with the returns we found where both Thailand and Indonesia have lower return in the beginning of the period. The remaining of ASEAN markets seem to move together in the same direction with small volatility. However in 2009, Singapore caught the highest return while other markets were not much affected.

4.7.5 Emerging markets

There is not much fluctuation in the returns of Malaysia over the 10 years period. China seems to have the most fluctuation in returns compared to Malaysia and India.

Figure 4.11: Daily log returns for Developed Markets

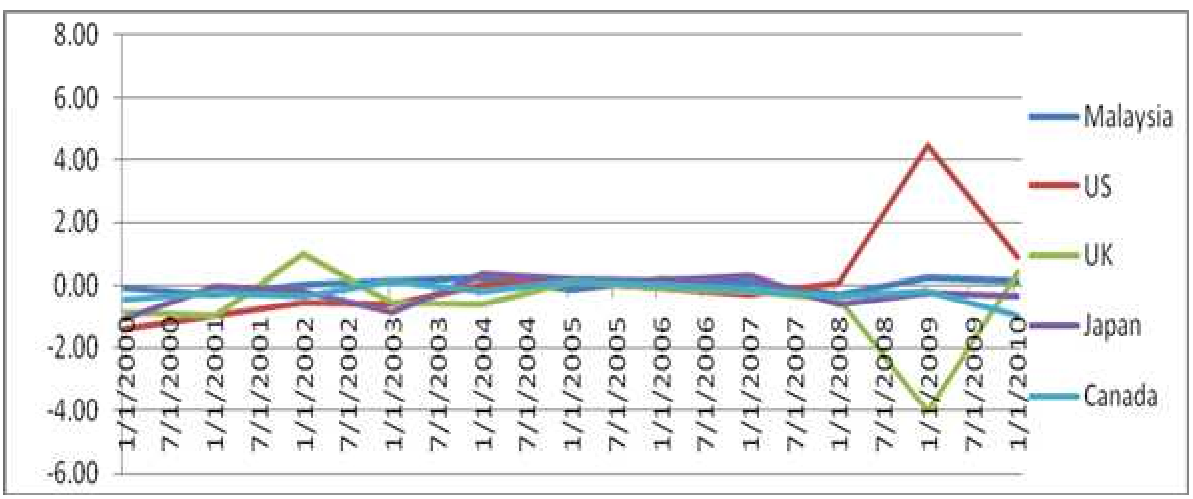


Figure 4.12: Standard Deviation for U.K.

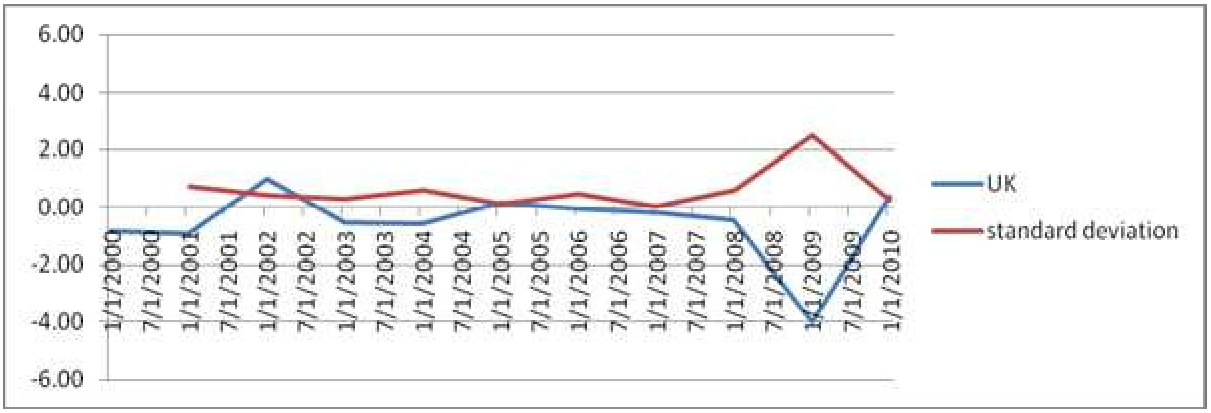


Figure 4.13: Standard Deviation for U.S.

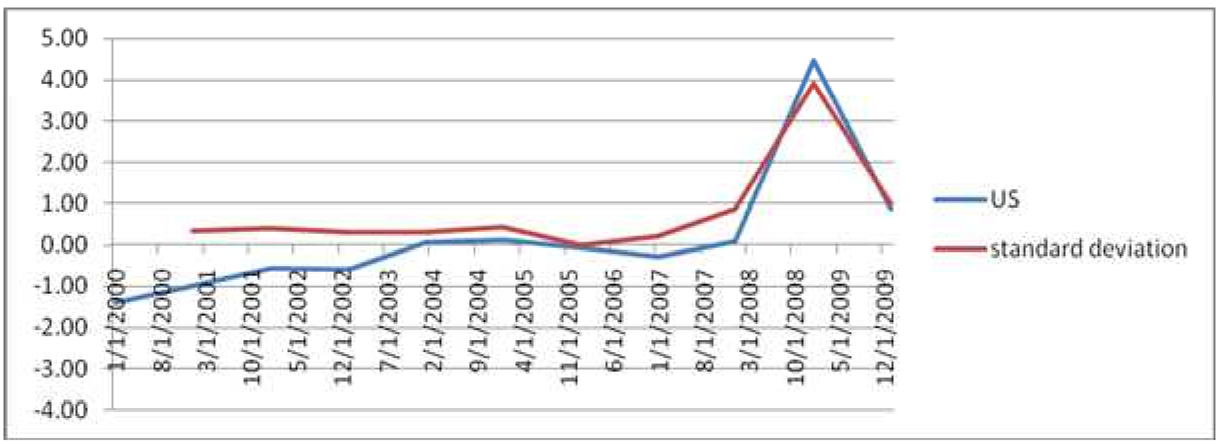


Figure 4.14: Daily log returns for Tiger markets

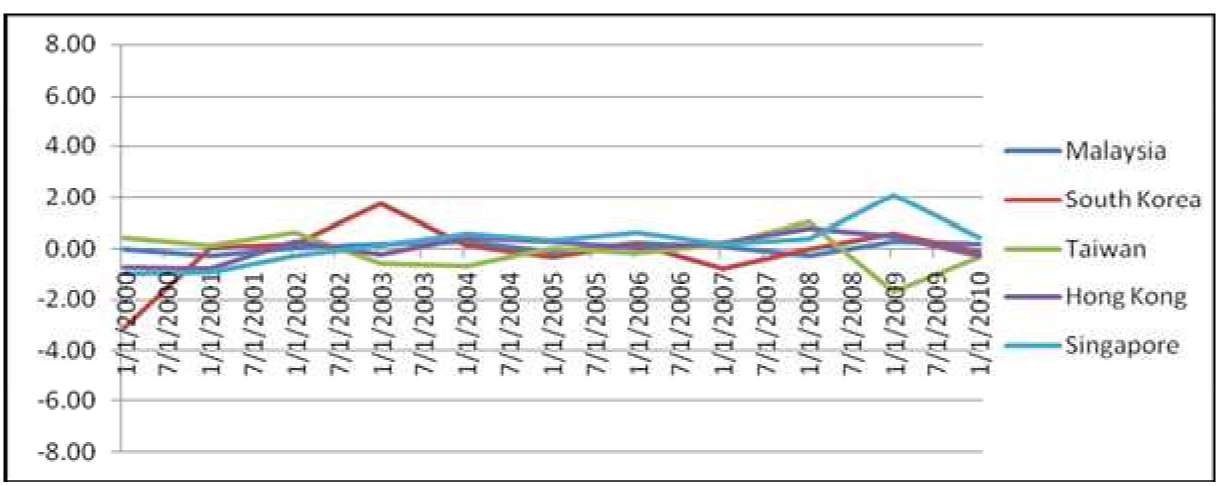


Figure 4.15: Daily log returns for Asia Pacific markets

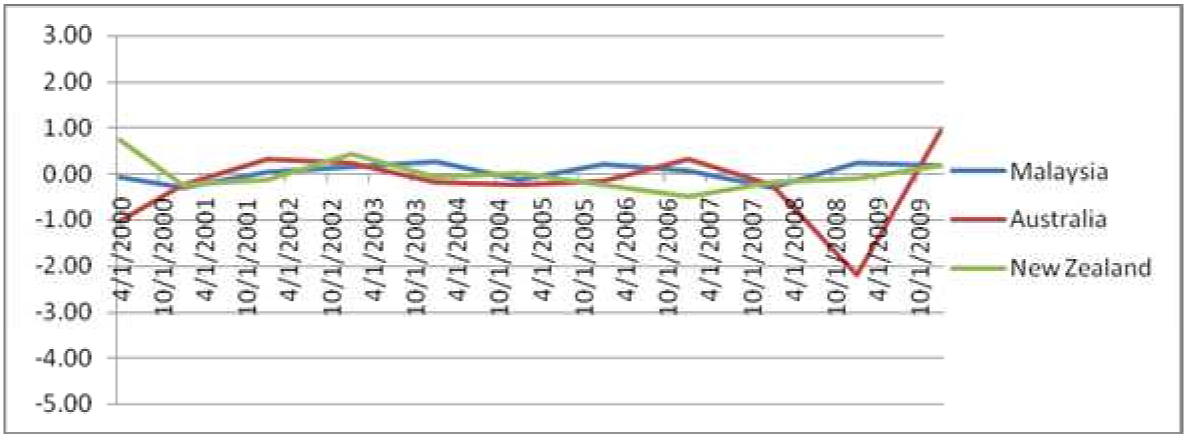


Figure 4.16: Daily log returns for ASEAN markets

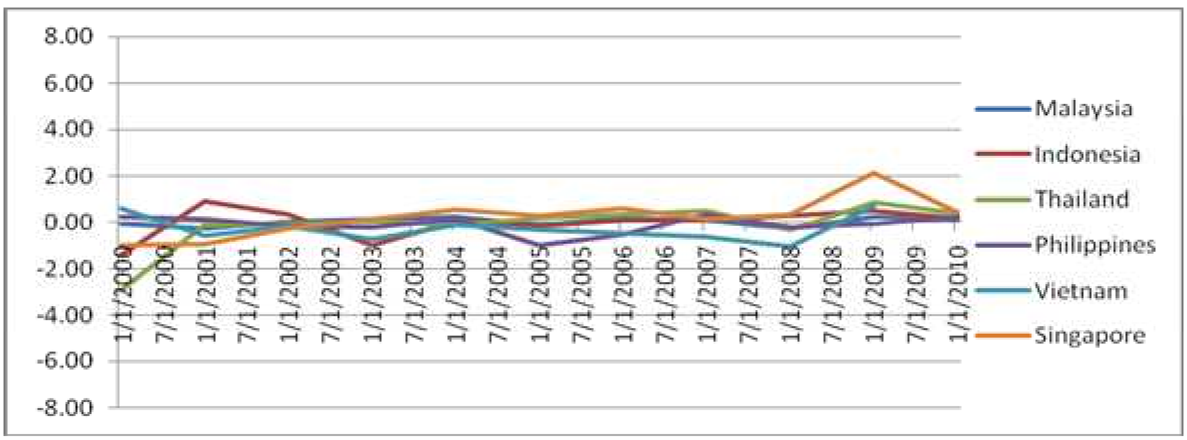
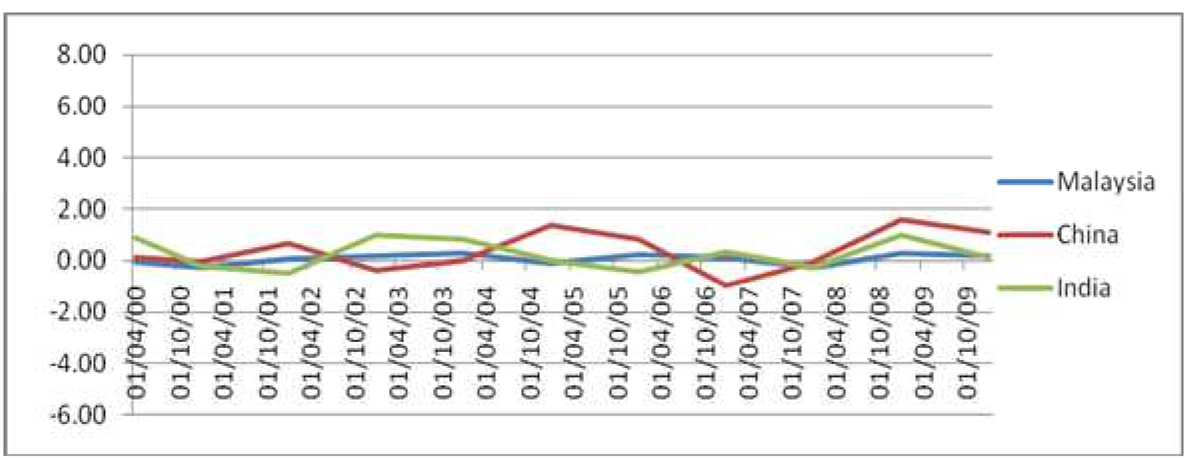


Figure 4.17: Daily log returns for Emerging markets



4.8 Impulse Response Function

An analysis of GIRF is presented in Figure 4.18 to Figure 4.22 below with a consideration of 150 days to check on the reaction of any dynamic system in response to shocks. If the system is stable, any shock should decline to zero. An unstable system would produce an explosive time path.

4.8.1 Developed Markets

It seemed that shocks in Japan will give positive impact on the Malaysian market for at least 100 days before it become stable. Surprisingly, impacts of shocks in U.K. and U.S. on the Malaysian market were perceived to be quite serious as it led to negative returns. Nevertheless, shocks in Malaysia and Japan will have positive effects on the U.S. market even though Malaysia and Japan did not granger cause the U.S. market. Shocks in Canada will give a positive impact on the Malaysian market. However, the impact will keep on reducing for at least 100 days until it becomes stable.

4.8.2 Tiger Markets

It can be seen that shocks in South Korea will give positive impact on Malaysian market for at least 100 days before it became stable. Amazingly, shocks in Hong Kong and Taiwan did not have a great impact on the Malaysian market. However, shock in Singapore was perceived to be quite serious as it led to negative returns for at least 150 days on the Malaysian market. To our surprise, shocks in South Korea, Malaysia, Hong Kong and Taiwan will give positive impact on the Singaporean market.

4.8.3 Asia Pacific Markets

From the Figure 4.20, we can conclude that shocks in New Zealand will have a positive impact on the Malaysian market for at least 100 days before it become stable. However, shocks in Australia will have serious negative impact towards the Malaysian market. Shocks that happened in Malaysia will cause the New Zealand market to have a little negative impact. In the mean time, Australia's shock had almost no effect on New Zealand market.

4.8.4 ASEAN Markets

As shown in the Figure 4.22, a shock in Indonesia will have a great positive impact on the Malaysian market compared to Philippines and Thailand which has less positive impact on the Malaysian market. Shocks in Philippines and Thailand gave a positive impact for at least 75 days and it became to stable. However, shock in Singapore was perceived to be quite serious as it led to negative returns for at least 150 days on the Malaysian market. Besides that, Vietnam's shock also recorded a negative impact on the Malaysian market. However, the negative impact will reduce after 50 days and will have no impact towards the Malaysian market on the day of 150. In addition, shocks in Malaysia will cause a positive impact on the Singaporean and Philippines market. Thailand will experience a negative effect if a shock happens in Malaysia. On the other hand, shocks in Malaysia will have almost no effect on the Indonesian market.

4.8.5 Emerging Markets

It seemed shocks in India and China have a negative effect on Malaysian market. Both India and China shared the same magnitude in terms of the impact of their instability on the Malaysian market. Surprisingly, shocks in Malaysia will have a great positive impact towards the Chinese and Indian market. However, shock in China will have a negative impact on the Indian market and shock in India will have a negative impact on the Chinese market.

Figure 4.18: Generalized Impulse Response Functions of One Standard Deviation Shocks/Innovations for Developed Markets

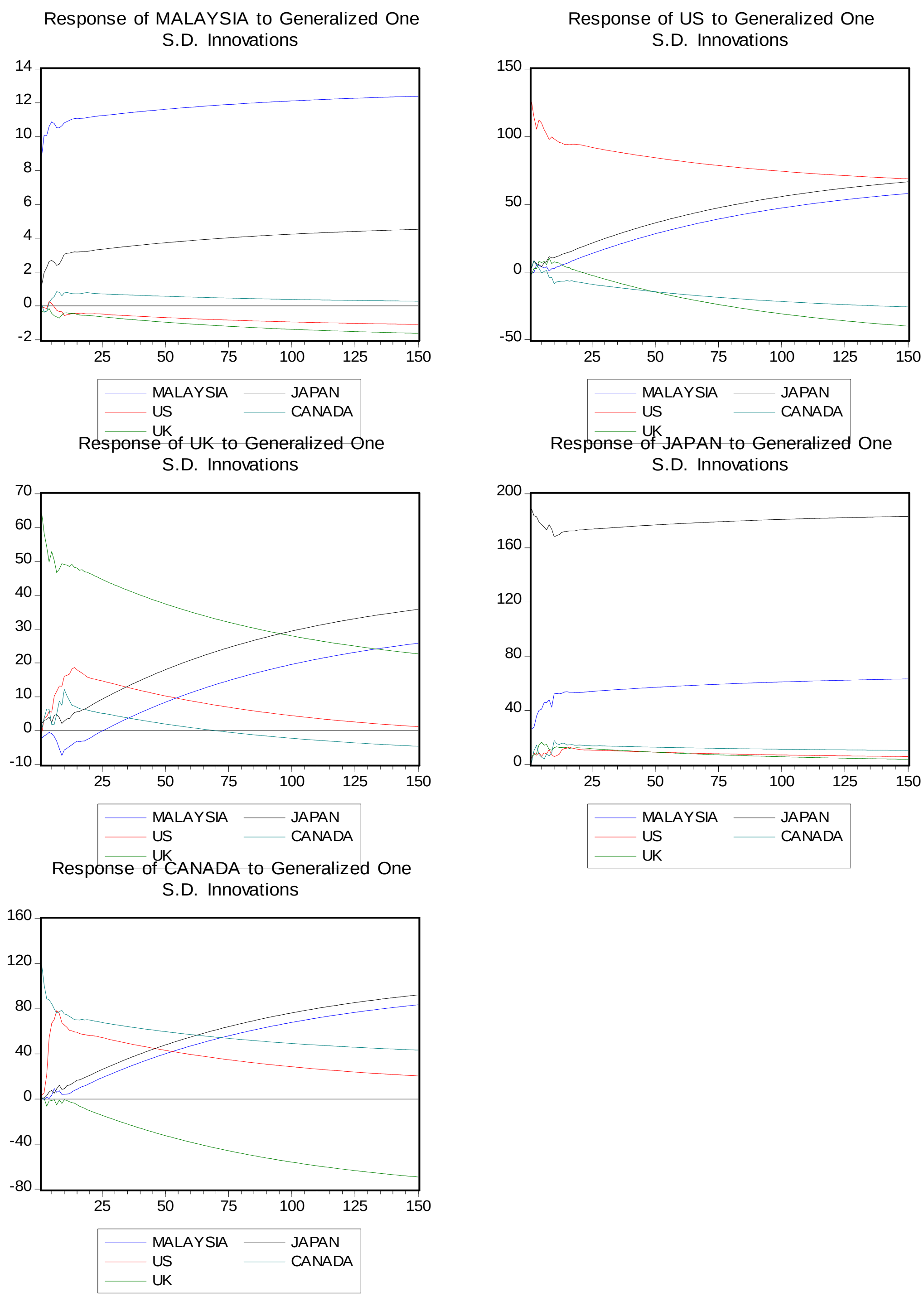


Figure 4.19: Generalized Impulse Response Functions of One Standard Deviation Shocks/Innovations for Tiger Markets

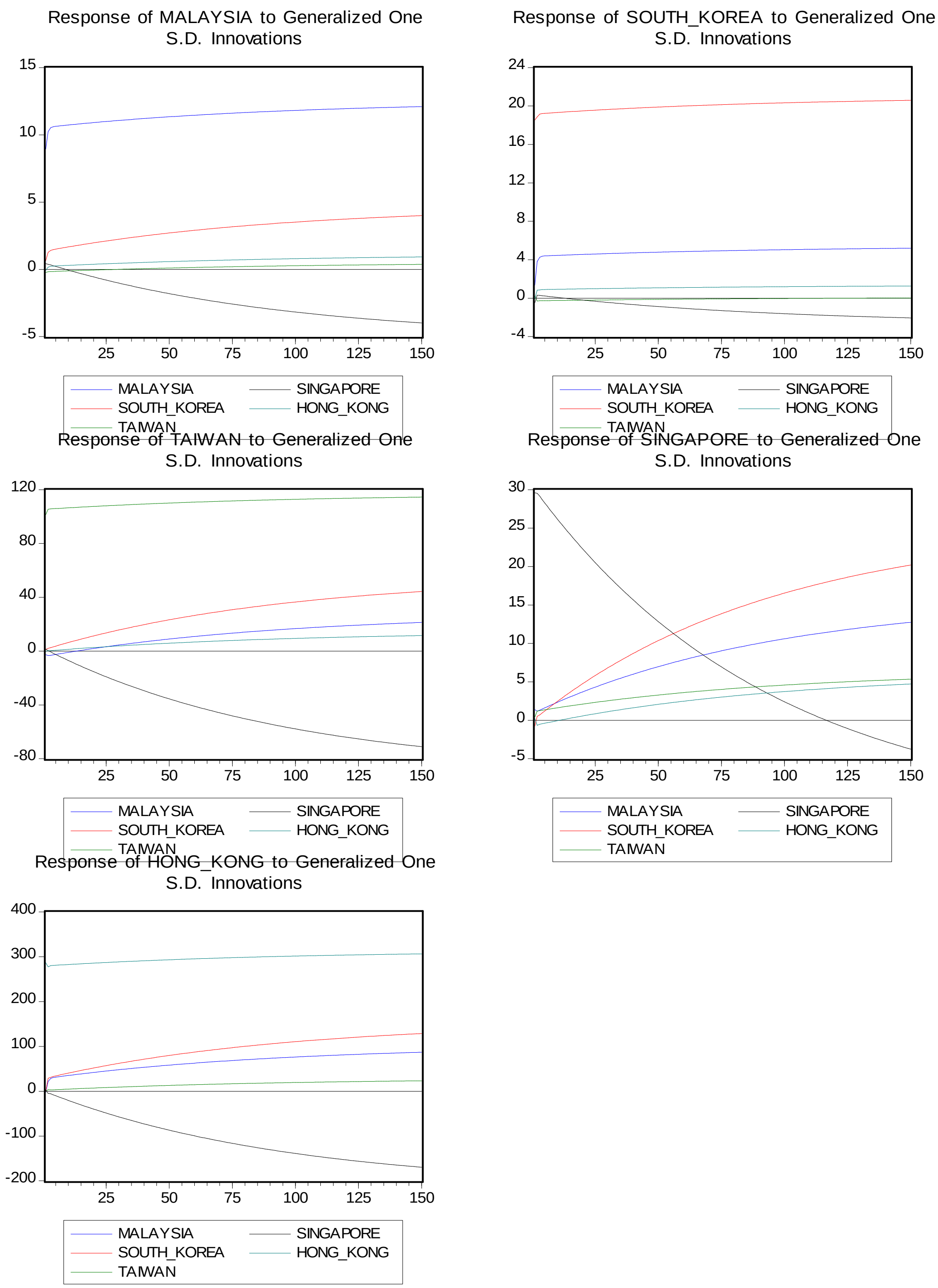


Figure 4.20: Generalized Impulse Response Functions of One Standard Deviation Shocks/ Innovations for Asia Pacific Markets

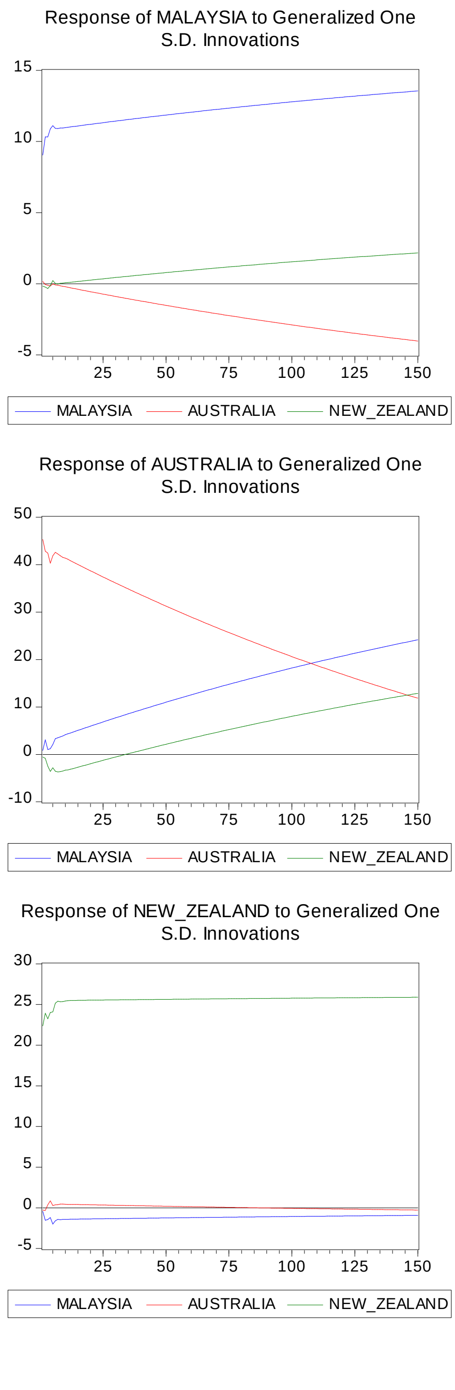


Figure 4.21: Generalized Impulse Response Functions of One Standard Deviation Shocks/ Innovations for Emerging Markets

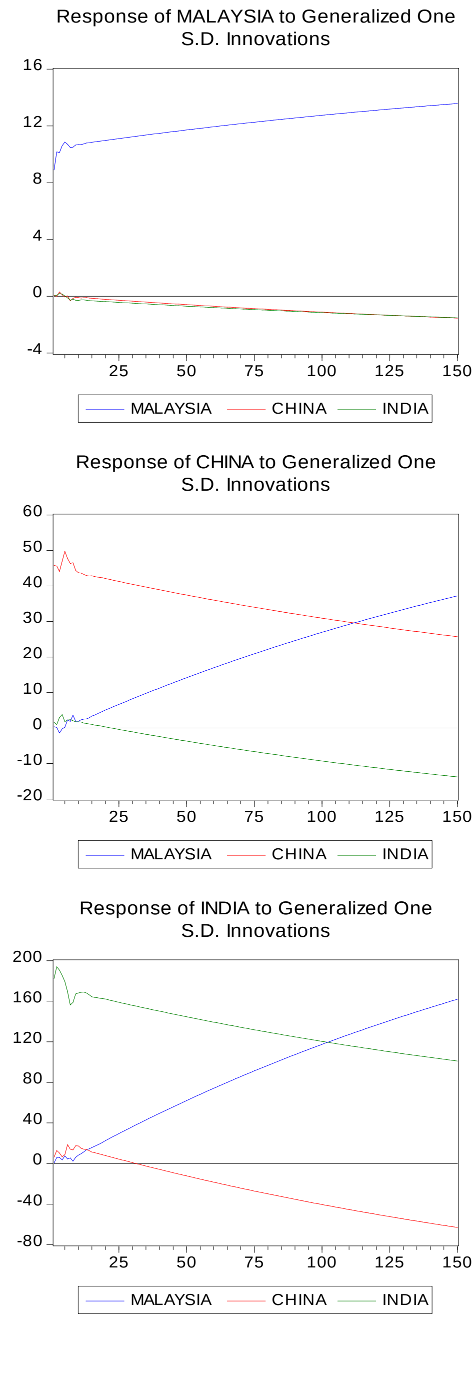
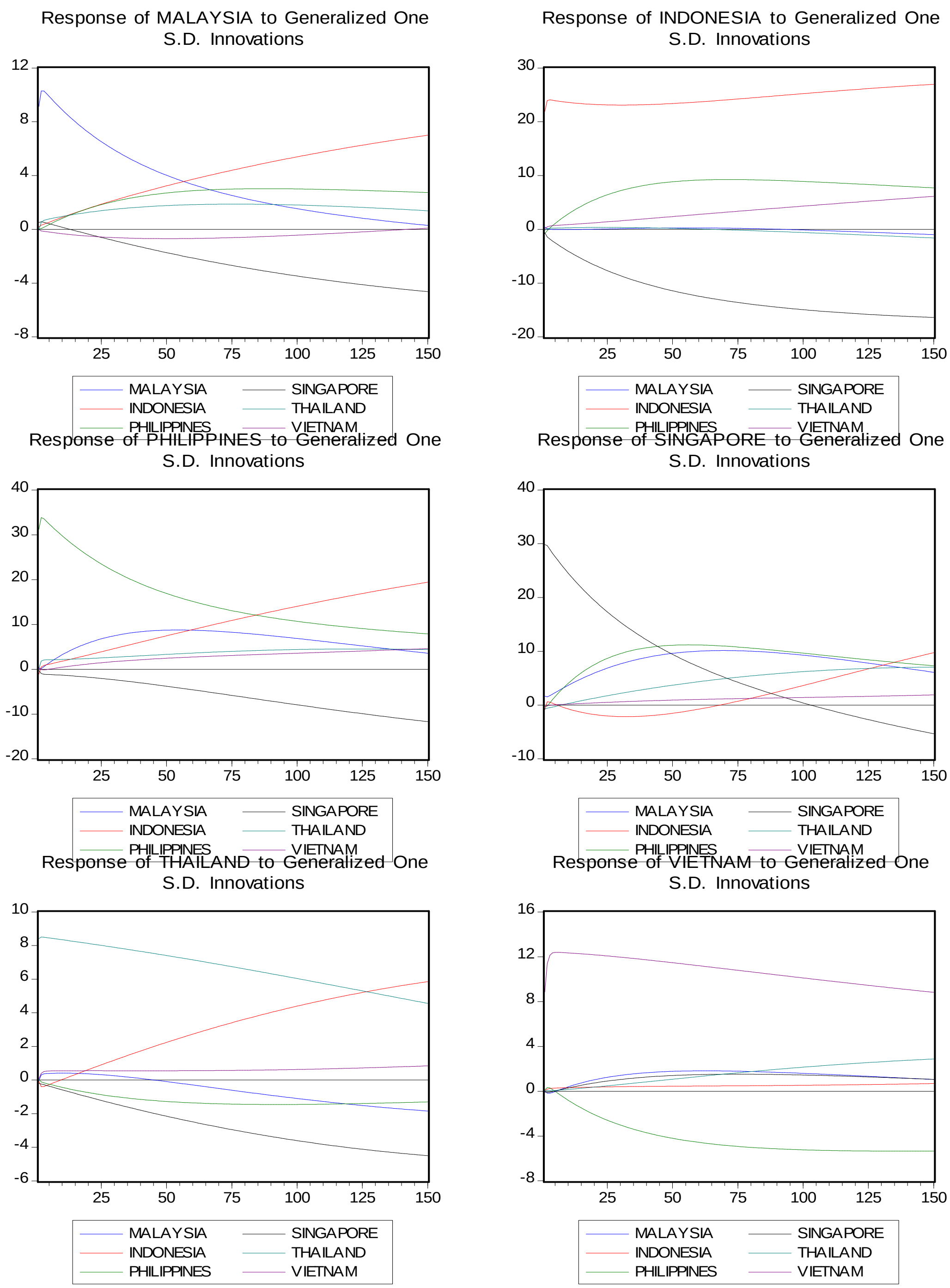


Figure 4.22: Generalized Impulse Response Functions of One Standard Deviation Shocks/Innovations for ASEAN Markets



4.9 Variance Decomposition

VDC is used for study the relative strength of each variable in explaining the changes in the dependent variable. The results of VDC are presented in Table 4.18 to table 4.22 on Developed markets, Tiger markets, Asia pacific markets, ASEAN markets and Emerging markets from January 2000 to October 2010.

4.9.1 Developed markets

Malaysia still remained strong on its exogenous as 95 per cent was explained by itself till end of period 150. The earlier discussion has shown that there were two-way granger causality between U.S. and U.K.; both countries seem somewhat endogenous as only about 61 percent were explained by themselves at period 150. Furthermore, Japan was said to be exogenous as 89 percent of the variation was explained by itself and around 10 percent was explained by Malaysia. There was a dramatic drop in Canada from 68 percent to 24 percent from period 10 to 150 which is said to be endogenous, with around 24 percent explained by Japan and Malaysia, 14 percent explained by U.K. and 11 percent explained by U.S..

4.9.2 Tiger markets

Malaysia and South Korea remained strong on their exogeneity as 89 percent and 93 percent of the variation were explained by themselves. Hong Kong and Taiwan, on the other hand, were relatively endogenous as only 76 percent and 78 percent were explained by themselves and about 12 percent explained by Singapore. There was a rapid drop of 30 percent in Singapore from period 50 to 150, which was said to be endogenous as 37 percent was explained by itself, 38 percent explained by South Korea and 17 percent explained by Malaysia.

4.9.3 Asia pacific markets

Malaysia and New Zealand were being accounted as strongly exogenous as over 94 percent of the variances were explained by themselves. However Australia was relatively endogenous as only 71 percent was explained by itself and 22 percent explained by Malaysia.

4.9.4 ASEAN markets

In the ASEAN markets, Malaysia is relatively endogenous as only 83 percent was explained by itself at period 80 and reduced further to 74 percent at period 150, with approximately 16 percent being explained by Philippines and 10 percent by Singapore. Philippines and Thailand remained strong exogenous as 99 percent and 93 percent of variance were explained by themselves. Furthermore, Vietnam was also strong on its exogeneity as 88 percent was explained by itself. However, Indonesia was said to be somewhat endogenous at only 63 percent with 14 percent being explained by Singapore. There was a dramatic drop in Singapore’s endogeneity from 70 percent in period 50 to 25 percent in period 150 which is said to be endogenous and a large proportion of about 73 percent was explained by Philippines.

4.9.5 Emerging markets

The Malaysian level of exogeneity was proportional to 99 percent, while China and India were somewhat endogenous at only 67 percent and 62 percent with around 28 percent and 33 percent being explained by Malaysia.

Table 4.18: Variance Decomposition of Developed markets: Malaysia, U.S, U.K, Japan, and Canada

Malaysia Period	S.E.	Malaysia	U.S.	U.K.	Japan	Canada
1	8.86874	100.00000	0.00000	0.00000	0.00000	0.00000
2	13.45227	99.70658	0.00035	0.00055	0.18433	0.10820
3	16.82835	99.47873	0.00232	0.00093	0.39341	0.12461
4	19.92568	99.25298	0.03047	0.01162	0.61441	0.09052
5	22.73811	99.12161	0.03237	0.00965	0.74681	0.08957
6	25.19190	99.05261	0.02641	0.01525	0.79842	0.10732
7	27.33351	98.97545	0.02673	0.02479	0.80343	0.16960
8	29.32035	98.89845	0.03060	0.03762	0.82527	0.20806
9	31.22512	98.81611	0.03413	0.03662	0.90250	0.21065
10	33.09287	98.64861	0.05258	0.03286	1.03526	0.23070
50	79.97460	97.02773	0.14840	0.09013	2.47401	0.25973
80	103.79840	96.35962	0.22374	0.20090	3.01226	0.20348
100	117.63500	95.96933	0.27144	0.27892	3.30608	0.17424
150	147.86100	95.16527	0.37354	0.45830	3.87868	0.12421
U.S. Period	S.E.	Malaysia	U.S.	U.K.	Japan	Canada
1	125.64010	0.00575	99.99425	0.00000	0.00000	0.00000
2	170.23930	0.00355	99.74263	0.05543	0.10738	0.09101
3	200.47790	0.07934	99.67017	0.08145	0.09332	0.07573
4	230.07200	0.10136	99.52909	0.23649	0.07546	0.05760
5	255.24540	0.10762	99.45850	0.30451	0.06148	0.06790
6	276.27850	0.10334	99.39014	0.37395	0.06720	0.06538
7	294.61910	0.10826	99.36367	0.38556	0.08210	0.06041
8	310.88600	0.09780	99.16775	0.48599	0.14828	0.10018
9	326.75620	0.09394	99.09268	0.49466	0.18569	0.13304
10	341.65080	0.09164	98.93958	0.52039	0.21799	0.23040
50	695.97280	2.78949	91.36474	0.52075	3.84297	1.48205
80	885.28130	6.51369	81.61908	1.65303	7.81652	2.39768
100	1003.27200	8.99769	75.11509	2.63046	10.33332	2.92343
150	1282.68300	14.15304	61.59851	4.97723	15.37212	3.89910
U.K. Period	S.E.	Malaysia	U.S.	U.K.	Japan	Canada
1	64.25299	0.11761	0.01656	99.86583	0.00000	0.00000
2	87.02348	0.09650	0.17997	99.58687	0.01225	0.12441
3	102.89400	0.08209	0.29192	99.18150	0.02394	0.42055
4	114.66930	0.06802	0.48132	98.80525	0.05095	0.59446
5	126.45870	0.06067	0.58184	98.81466	0.04282	0.50002
6	136.54530	0.06923	1.06200	98.35835	0.07332	0.43711
7	144.92090	0.10856	1.57837	97.72476	0.11278	0.47554

8	153.47330	0.21656	2.13840	96.81984	0.12672	0.69849
9	162.03590	0.40071	2.56833	96.11063	0.11712	0.80322
10	170.57160	0.47402	3.20189	95.03459	0.11213	1.17736
50	343.53660	0.79136	7.44991	87.49757	3.33752	0.92364
80	414.61500	3.33576	6.31680	80.95338	8.74801	0.64606
100	457.07840	5.81488	5.48400	75.30473	12.81506	0.58134
150	559.43220	12.42883	3.79728	61.00667	22.09467	0.67255
Japan Period	S.E.	Malaysia	U.S.	U.K.	Japan	Canada
1	188.61250	1.91719	0.06353	0.14261	97.87667	0.00000
2	263.51250	2.06675	0.14217	0.16770	97.51519	0.10819
3	321.26430	2.62987	0.14616	0.19950	96.79267	0.23182
4	368.38770	3.17940	0.17178	0.34128	96.10567	0.20188
5	409.36070	3.57358	0.16223	0.47031	95.62095	0.17292
6	446.00780	4.06012	0.17656	0.52395	95.09083	0.14853
7	479.11890	4.42679	0.18241	0.57262	94.67293	0.14526
8	511.43110	4.75328	0.20898	0.56581	94.33600	0.13593
9	540.55970	4.86787	0.20587	0.55623	94.23032	0.13972
10	567.15910	5.26668	0.19893	0.56886	93.75787	0.20766
50	1259.16300	8.62591	0.32598	0.54570	90.09268	0.40973
80	1606.17300	9.27321	0.29032	0.45135	89.60396	0.38117
100	1805.13200	9.57853	0.26715	0.40058	89.39267	0.36107
150	2234.80700	10.12505	0.22127	0.30895	89.02543	0.31930
Canada Period	S.E.	Malaysia	U.S.	U.K.	Japan	Canada
1	118.62840	0.00598	0.06727	0.00512	0.00285	99.91879
2	156.04810	0.00465	0.15988	0.00518	0.00455	99.82574
3	180.75080	0.01129	1.54433	0.11545	0.02012	98.30882
4	207.52560	0.00904	7.89675	0.09020	0.07102	91.93299
5	233.37440	0.02834	14.50987	0.07166	0.11260	85.27753
6	256.15080	0.15208	19.66462	0.05990	0.10016	80.02324
7	278.06350	0.17525	24.62074	0.07274	0.14057	74.99070
8	298.14040	0.21305	27.85802	0.06339	0.21956	71.64598
9	315.32140	0.20663	29.50668	0.06561	0.23737	69.98371
10	330.49270	0.20452	30.80762	0.05978	0.25866	68.66943
50	677.65280	5.78684	31.06810	3.14801	7.36624	52.63081
80	893.18120	12.91679	23.39550	7.55614	14.63841	41.49316
100	1040.23200	17.03110	19.05694	10.17503	18.60831	35.12862
150	1410.12800	24.06921	11.90561	14.75256	25.11381	24.15880

Table 4.19: Variance Decomposition of Tiger markets: Malaysia, Hong Kong, South Korea, Singapore, and Taiwan

Malaysia Period	S.E.	Malaysia	Hong Kong	South Korea	Singapore	Taiwan
1	8.94561	100.00000	0.00000	0.00000	0.00000	0.00000
2	13.61396	99.81297	0.03306	0.14415	0.00536	0.00446
3	17.22630	99.70077	0.05276	0.22916	0.01097	0.00635
4	20.24372	99.62582	0.06441	0.28379	0.01835	0.00764
5	22.88251	99.56712	0.07235	0.32422	0.02758	0.00872
6	25.25795	99.51564	0.07842	0.35761	0.03862	0.00972
7	27.43788	99.46731	0.08344	0.38717	0.05142	0.01068
8	29.46566	99.42014	0.08782	0.41452	0.06591	0.01162
9	31.37084	99.37308	0.09179	0.44053	0.08203	0.01257
10	33.17459	99.32554	0.09549	0.46571	0.09974	0.01352
50	78.73974	96.63681	0.20897	1.46198	1.63117	0.06106
80	102.83370	94.24856	0.28158	2.19240	3.17766	0.09980
100	117.13880	92.73035	0.32374	2.63294	4.18914	0.12383
150	149.09990	89.46835	0.40845	3.54434	6.40429	0.17457
Hong Kong Period	S.E.	Malaysia	Hong Kong	South Korea	Singapore	Taiwan
1	286.54120	0.00648	99.99352	0.00000	0.00000	0.00000
2	400.57100	0.30239	99.16087	0.49210	0.03626	0.00837
3	490.71120	0.54121	98.69800	0.69396	0.05654	0.01030
4	567.13350	0.69336	98.38607	0.82816	0.08034	0.01207
5	634.75180	0.79864	98.15213	0.92813	0.10739	0.01370
6	696.11340	0.87821	97.95792	1.01072	0.13785	0.01530
7	752.75200	0.94272	97.78527	1.08347	0.17166	0.01689
8	805.66900	0.99776	97.62481	1.15022	0.20872	0.01850
9	855.56000	1.04648	97.47130	1.21314	0.24894	0.02014
10	902.93120	1.09079	97.32167	1.27350	0.29222	0.02181
50	2133.64400	2.23701	90.66857	3.43707	3.54794	0.10941
80	2813.28000	2.87663	85.49762	4.86935	6.57702	0.17938
100	3225.97300	3.22490	82.39733	5.68598	8.47038	0.22142
150	4166.92700	3.87848	76.12961	7.27509	12.41030	0.30653
South Korea Period	S.E.	Malaysia	Hong Kong	South Korea	Singapore	Taiwan
1	18.52505	0.53175	0.00099	99.46726	0.00000	0.00000
2	26.58164	2.31468	0.10895	97.48080	0.06321	0.03235
3	32.91419	3.18867	0.14601	96.54837	0.07733	0.03961
4	38.24546	3.66764	0.16720	96.04034	0.08195	0.04287
5	42.93339	3.96083	0.18035	95.73164	0.08266	0.04453
6	47.16618	4.15790	0.18942	95.52568	0.08158	0.04543

7	51.05643	4.29991	0.19614	95.37848	0.07957	0.04591
8	54.67713	4.40767	0.20140	95.26772	0.07706	0.04614
9	58.07865	4.49274	0.20570	95.18106	0.07430	0.04620
10	61.29744	4.56200	0.20933	95.11113	0.07140	0.04615
50	140.18070	5.25282	0.26358	94.41917	0.03097	0.03346
80	179.24200	5.43717	0.28695	94.16892	0.08073	0.02624
100	201.61860	5.53026	0.29988	94.01656	0.13066	0.02265
150	249.96710	5.70436	0.32560	93.68174	0.27183	0.01648
Singapore Period	S.E.	Malaysia	Hong Kong	South Korea	Singapore	Taiwan
1	29.60001	0.22152	0.00831	0.08542	99.68475	0.00000
2	41.84513	0.19148	0.02713	0.05396	99.69308	0.03436
3	51.03137	0.19633	0.02793	0.05031	99.67573	0.04970
4	58.58869	0.21187	0.02683	0.05971	99.64038	0.06121
5	65.09494	0.23348	0.02496	0.07719	99.59310	0.07127
6	70.84582	0.25935	0.02287	0.10141	99.53552	0.08086
7	76.01814	0.28869	0.02079	0.13183	99.46834	0.09036
8	80.72789	0.32113	0.01884	0.16821	99.39185	0.09998
9	85.05632	0.35646	0.01710	0.21046	99.30616	0.10982
10	89.06310	0.39457	0.01561	0.25856	99.21129	0.11998
50	160.97250	4.07747	0.27003	7.24173	87.52695	0.88382
80	188.58850	8.80108	0.83944	17.57594	71.00605	1.77749
100	207.38800	11.97738	1.28596	24.88359	59.49515	2.35792
150	261.32030	17.75588	2.21994	38.86344	37.78576	3.37498
Taiwan Period	S.E.	Malaysia	Hong Kong	South Korea	Singapore	Taiwan
1	101.37420	0.06821	0.00002	0.02233	0.02380	99.88563
2	146.29810	0.08412	0.00016	0.03667	0.01295	99.86610
3	180.52100	0.08499	0.00043	0.04924	0.00892	99.85643
4	209.29550	0.08127	0.00082	0.06285	0.01055	99.84451
5	234.63730	0.07596	0.00135	0.07785	0.01748	99.82736
6	257.56560	0.07017	0.00201	0.09427	0.02953	99.80402
7	278.68060	0.06440	0.00280	0.11211	0.04651	99.77418
8	298.37090	0.05888	0.00371	0.13133	0.06828	99.73781
9	316.90530	0.05372	0.00473	0.15189	0.09468	99.69497
10	334.47890	0.04901	0.00587	0.17376	0.12558	99.64578
50	787.42600	0.19151	0.10970	1.69434	3.69677	94.30768
80	1047.06600	0.51218	0.21482	3.10068	7.52884	88.64348
100	1193.39800	0.72013	0.27527	3.89195	9.76053	85.35212
150	1548.57300	1.20668	0.40673	5.58756	14.65498	78.14406

Table 4.20: Variance Decomposition of Asia Pacific markets: Malaysia, Australia, and New Zealand

Malaysia Period	S.E.	Malaysia	Australia	New Zealand
1	9.03895	100.00000	0.00000	0.00000
2	13.71918	99.97097	0.02811	0.00092
3	17.16909	99.94688	0.04618	0.00694
4	20.32818	99.93257	0.06129	0.00614
5	23.17336	99.90444	0.05548	0.04009
6	25.61985	99.90259	0.05671	0.04069
7	27.84905	99.90129	0.05942	0.03929
8	29.92669	99.89503	0.06408	0.04089
9	31.86678	99.88676	0.07046	0.04278
10	33.70564	99.87750	0.07749	0.04501
50	80.26454	98.84744	0.85542	0.29714
80	105.21440	97.59915	1.80529	0.59556
100	120.30280	96.65976	2.52230	0.81794
150	155.18680	94.19570	4.40737	1.39694
Australia Period	S.E.	Malaysia	Australia	New Zealand
1	45.29805	0.03192	99.96808	0.00000
2	62.36868	0.26379	99.73452	0.00169
3	75.46771	0.19773	99.73591	0.06636
4	85.60545	0.17364	99.64647	0.17989
5	95.33384	0.18738	99.61037	0.20225
6	104.49370	0.25553	99.49549	0.24898
7	112.79010	0.31650	99.39408	0.28941
8	120.37740	0.37292	99.30895	0.31813
9	127.40810	0.42600	99.23768	0.33632
10	134.02780	0.48134	99.17291	0.34574
50	269.43400	3.63829	96.13324	0.22847
80	318.64120	7.92351	91.23951	0.83698
100	343.96190	11.65442	86.65074	1.69485
150	400.06740	22.91343	71.87659	5.20998
New Zealand Period	S.E.	Malaysia	Australia	New Zealand
1	22.36037	0.03635	0.01453	99.94912
2	32.76160	0.23113	0.01517	99.75370
3	40.18453	0.28144	0.01996	99.69860
4	46.83980	0.27167	0.05032	99.67801
5	52.69934	0.35808	0.04348	99.59844
6	58.41159	0.36574	0.04002	99.59424
7	63.70866	0.35618	0.03818	99.60564

8	68.57482	0.35276	0.03815	99.60909
9	73.12641	0.34775	0.03803	99.61422
10	77.43318	0.34368	0.03741	99.61891
50	179.41960	0.27947	0.02199	99.69854
80	228.02920	0.25336	0.01483	99.73180
100	255.47900	0.23848	0.01184	99.74968
150	314.10920	0.20720	0.00918	99.78362

Table 4.21 Variance Decomposition of ASEAN markets: Malaysia, Philippines, Indonesia, Singapore, Thailand, and Vietnam

Malaysia Period	S.E.	Malaysia	Philippines	Indonesia	Singapore	Thailand	Vietnam
1	9.15968	100.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2	13.92468	99.78328	0.00047	0.00387	0.00480	0.19552	0.01206
3	17.42382	99.71843	0.02524	0.04261	0.00346	0.19787	0.01239
4	20.31114	99.63438	0.06933	0.07763	0.00303	0.20358	0.01205
5	22.83166	99.55135	0.12379	0.09775	0.00639	0.20928	0.01144
6	25.10021	99.46337	0.18518	0.10974	0.01468	0.21611	0.01093
7	27.18067	99.36837	0.25231	0.11726	0.02821	0.22326	0.01058
8	29.11399	99.26473	0.32530	0.12206	0.04701	0.23054	0.01036
9	30.92833	99.15176	0.40415	0.12508	0.07095	0.23785	0.01021
10	32.64410	99.02924	0.48874	0.12690	0.09987	0.24516	0.01010
50	75.95585	90.09058	6.03086	0.07795	3.28841	0.50164	0.01056
80	99.15594	83.39620	10.00852	0.05222	5.90454	0.62757	0.01095
100	112.86810	79.86815	12.08500	0.04173	7.30738	0.68666	0.01109
150	142.90590	73.77139	15.65306	0.02693	9.75600	0.78136	0.01126
Philippines Period	S.E.	Malaysia	Philippines	Indonesia	Singapore	Thailand	Vietnam
1	31.34500	0.00080	99.99920	0.00000	0.00000	0.00000	0.00000
2	46.66512	0.00082	99.70008	0.13577	0.01491	0.14699	0.00144
3	58.22344	0.00187	99.49788	0.18131	0.01066	0.29771	0.01059
4	67.89396	0.00427	99.37214	0.20251	0.00948	0.39378	0.01784
5	76.38213	0.00622	99.29284	0.21500	0.00872	0.45449	0.02272
6	84.02760	0.00759	99.23947	0.22339	0.00820	0.49531	0.02604
7	91.03766	0.00857	99.20153	0.22935	0.00781	0.52437	0.02838
8	97.54835	0.00929	99.17332	0.23375	0.00748	0.54603	0.03012
9	103.65350	0.00985	99.15158	0.23712	0.00721	0.56279	0.03146
10	109.42080	0.01029	99.13432	0.23978	0.00696	0.57614	0.03252
50	247.86510	0.01272	99.01691	0.25527	0.00291	0.67231	0.03988
80	314.30350	0.01263	99.00772	0.25509	0.00188	0.68221	0.04048
100	351.78110	0.01253	99.00488	0.25471	0.00150	0.68572	0.04067
150	431.59390	0.01234	99.00130	0.25382	0.00101	0.69063	0.04090
Indonesia Period	S.E.	Malaysia	Philippines	Indonesia	Singapore	Thailand	Vietnam

1	21.89361	0.02778	0.13641	99.83582	0.00000	0.00000	0.00000
2	32.47158	0.01263	0.07473	99.86371	0.04077	0.00812	0.00003
3	40.32182	0.00821	0.13116	99.73545	0.06584	0.01449	0.04485
4	46.91527	0.00614	0.23354	99.53574	0.10346	0.02364	0.09747
5	52.70986	0.00494	0.34044	99.34201	0.15169	0.03326	0.12766
6	57.93951	0.00419	0.45267	99.14742	0.20934	0.04213	0.14425
7	62.74677	0.00374	0.57236	98.94399	0.27488	0.05009	0.15494
8	67.22490	0.00353	0.70003	98.72857	0.34777	0.05741	0.16270
9	71.43794	0.00351	0.83562	98.50025	0.42773	0.06431	0.16858
10	75.43208	0.00365	0.97887	98.25903	0.51440	0.07094	0.17311
50	180.70510	0.05316	9.09021	84.27971	6.10685	0.29617	0.17391
80	240.26300	0.09323	14.23450	75.29022	9.81563	0.41105	0.15536
100	275.97470	0.11385	16.76434	70.85390	11.65731	0.46479	0.14581
150	354.66900	0.14843	20.89705	63.59113	14.68359	0.54986	0.12994
Singapore Period	S.E.	Malaysia	Philippines	Indonesia	Singapore	Thailand	Vietnam
1	29.80804	0.22084	0.00655	0.09188	99.68073	0.00000	0.00000
2	42.08988	0.18359	0.00392	0.06162	99.74422	0.00001	0.00664
3	50.96855	0.17146	0.09269	0.05109	99.67953	0.00046	0.00477
4	58.26666	0.16474	0.22772	0.04510	99.55688	0.00038	0.00519
5	64.57283	0.15865	0.38558	0.04065	99.40897	0.00069	0.00546
6	70.15090	0.15291	0.57070	0.03713	99.23224	0.00145	0.00558
7	75.16933	0.14748	0.78458	0.03418	99.02539	0.00268	0.00569
8	79.74371	0.14231	1.02743	0.03163	98.78841	0.00440	0.00583
9	83.95566	0.13733	1.29930	0.02938	98.52139	0.00661	0.00599
10	87.86532	0.13253	1.60011	0.02736	98.22453	0.00931	0.00615
50	172.85230	0.05557	28.66665	0.04023	70.83009	0.39448	0.01299
80	221.84280	0.08766	49.46179	0.09254	49.61359	0.72885	0.01558
100	253.77720	0.11618	59.22743	0.12309	39.62530	0.89162	0.01638
150	328.51250	0.17298	73.53432	0.17448	24.96465	1.13649	0.01708
Thailand Period	S.E.	Malaysia	Philippines	Indonesia	Singapore	Thailand	Vietnam
1	8.40214	0.00218	0.00476	0.00569	0.09757	99.88980	0.00000
2	11.99997	0.05536	0.00968	0.13058	0.13469	99.51738	0.15230
3	15.05572	0.17134	0.01249	0.15025	0.21720	99.32440	0.12432
4	17.61553	0.25017	0.01523	0.15756	0.27780	99.20273	0.09652
5	19.86381	0.29957	0.02080	0.16087	0.31848	99.12177	0.07851
6	21.88565	0.33059	0.02799	0.16312	0.35229	99.05902	0.06699
7	23.73941	0.35127	0.03659	0.16491	0.38341	99.00478	0.05903
8	25.46172	0.36577	0.04627	0.16648	0.41334	98.95498	0.05316
9	27.07767	0.37626	0.05693	0.16793	0.44260	98.90767	0.04861
10	28.60526	0.38399	0.06849	0.16929	0.47150	98.86175	0.04499
50	65.94709	0.36645	0.88737	0.20470	1.61535	96.90767	0.01846
80	84.44107	0.33154	1.53935	0.22055	2.33258	95.56051	0.01546
100	95.00175	0.31397	1.90616	0.22820	2.71563	94.82169	0.01435

150	117.65620	0.28405	2.58642	0.24104	3.40444	93.47130	0.01276
Vietnam Period	S.E.	Malaysia	Philippines	Indonesia	Singapore	Thailand	Vietnam
1	8.79613	0.00001	0.03050	0.01216	0.00299	0.00026	99.95408
2	14.63008	0.02097	0.08840	0.03044	0.00194	0.00034	99.85793
3	18.70050	0.01471	0.07952	0.06851	0.02865	0.01199	99.79663
4	21.85401	0.01107	0.06293	0.09120	0.04493	0.02484	99.76502
5	24.56028	0.00973	0.05015	0.10439	0.04593	0.03260	99.75720
6	26.99901	0.00898	0.04176	0.11353	0.04141	0.03647	99.75786
7	29.24008	0.00854	0.03750	0.12070	0.03602	0.03833	99.75891
8	31.32295	0.00835	0.03726	0.12663	0.03140	0.03913	99.75724
9	33.27650	0.00835	0.04089	0.13173	0.02822	0.03929	99.75152
10	35.12263	0.00849	0.04825	0.13622	0.02688	0.03902	99.74114
50	80.56780	0.03802	1.95156	0.22354	1.15129	0.01293	96.62267
80	103.71860	0.06114	3.77442	0.25840	2.37796	0.01387	93.51421
100	117.14020	0.07367	4.81319	0.27470	3.09249	0.01761	91.72834
150	146.22780	0.09609	6.72657	0.30122	4.42450	0.02784	88.42379

Table 4.22 Variance Decomposition of Emerging markets: Malaysia, China, and India

Malaysia Period	S.E.	Malaysia	China	India
1	8.89565	100.00000	0.00000	0.00000
2	13.50958	99.99382	0.00434	0.00185
3	16.88094	99.96899	0.02015	0.01087
4	19.93356	99.97377	0.01453	0.01171
5	22.69761	99.97620	0.01477	0.00903
6	25.09669	99.97710	0.01271	0.01019
7	27.20011	99.94771	0.03206	0.02022
8	29.15954	99.94194	0.03461	0.02345
9	31.04675	99.93712	0.03274	0.03014
10	32.83454	99.93151	0.03220	0.03630
50	78.41625	99.67586	0.14459	0.17955
80	102.72800	99.39180	0.29742	0.31078
100	117.29890	99.18403	0.41264	0.40333
150	150.48900	98.64909	0.71537	0.63554
China Period	S.E.	Malaysia	China	India
1	45.75806	0.00682	99.99318	0.00000
2	64.62668	0.00395	99.98741	0.00865
3	78.25491	0.03611	99.92239	0.04150
4	91.28635	0.02727	99.88452	0.08821
5	103.96170	0.02145	99.91047	0.06808
6	114.41320	0.05744	99.88371	0.05885
7	123.44850	0.07212	99.87371	0.05417

8	131.97260	0.13922	99.81232	0.04846
9	139.25120	0.14385	99.81235	0.04380
10	145.95690	0.14742	99.81248	0.04010
50	300.22150	3.64321	95.96179	0.39501
80	372.73100	9.78090	88.94270	1.27641
100	416.29280	14.91188	83.02418	2.06394
150	522.80890	28.78022	66.92530	4.29449
India Period	S.E.	Malaysia	China	India
1	182.31990	0.00071	0.11699	99.88230
2	266.31970	0.05076	0.28701	99.66224
3	327.56730	0.06762	0.28785	99.64453
4	376.41160	0.06027	0.24919	99.69054
5	417.04690	0.08210	0.24714	99.67076
6	450.29320	0.07998	0.38131	99.53871
7	476.78010	0.08507	0.42811	99.48681
8	182.31990	0.00071	0.11699	99.88230
9	266.31970	0.05076	0.28701	99.66224
10	327.56730	0.06762	0.28785	99.64453
50	1161.49600	4.71192	0.32577	94.96231
80	1458.58800	12.24469	0.93879	86.81652
100	1644.18900	18.26026	1.72422	80.01552
150	2115.51800	33.41162	4.29011	62.29828

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Introduction

Past researches mainly studied on the long run relationship between countries before the 1997 Asian financial crisis. Most would agree that the degree to which many countries are integrated into the world capital markets has changed over time due to the time-varying nature of international stock market relationship (Bekaert and Harvey, 1995; De Jong and De Roon, 2001; Yang, Kolari, and Min, 2002; Ong and Habibullah, 2007). Our study focused on the investigation of long run relationship between the Malaysian market and five trading blocs (Developed market, Tiger market, Asia-pacific market, ASEAN market and Emerging market) from year 2000 to 2010. Besides that, we also investigate how each individual stock market affects each other and the Malaysian market. It is important to provide the most up-to-date information to the public especially to investors who have the intention to diversify their portfolio internationally.

Chapter Five presents the conclusion of our findings on the relationship between the Malaysian market and five trading blocs based on the sample data (Daily closing price) from January 2000 to October 2010. Besides that, this chapter also includes the limitations of this study and recommendations for future research on this topic.

5.2 Summary

It is important to know if there are any changes of relationship between the Malaysian market and the five trading blocs investigated compared to past studies. The main objectives being pursued are

1) To re-examine the long term relationship between the Malaysian market and five trading blocs (Developed market, Tiger market, Asia-pacific market, ASEAN market and Emerging market) based on the time period from January 2000 to October 2010.

2) To investigate the trading blocs that affects the Malaysian market significantly.

3) To investigate the unilateral or bilateral relationships among the Malaysian market and various trading blocs.

4) To identify the markets those have significant impact on the Malaysian market among the various trading blocs.

5) To determine the market that has the greatest impact on the Malaysian market in each of the trading blocs.

6) To identify the extension of economic shocks affect the Malaysian market.

Based on the results from the cointegration test, there is an existence of one cointegration between the Malaysian market and the Developed markets, three cointegration between the Malaysian market and the Tiger markets, one cointegration between the Malaysian market and the Asia Pacific markets, three cointegration between the Malaysian market and the ASEAN markets and two cointegration between the Malaysian market and the Emerging markets. Both trace and maximum eigenvalue produced evidence that there is at least one single cointegrating vector exist in the five trading blocs at a 5 percent significance level. These findings suggested that there is a long-run relationship between the Malaysian market and each of the five blocs and is consistent with the findings of Marimuthu and Ng (2010), who found significant long-run relationships between the Malaysian market and the Tiger markets (Hong Kong, South Korea, Singapore and Taiwan). This finding is also consistent with the study conducted by Wasiuzzaman and Lim (2009), who found a significant long run relationship between Malaysia, Singapore, Japan and U.S. stock markets by using the sample period of 2000 to 2006.

The Granger Causality test is used to investigate if there is any unilateral or bilateral causality between the Malaysian market and the selected markets. From the Developed markets bloc result, it is found that U.S., Japan and Canada granger cause Malaysia. Besides that, strong bidirectional causality was found between Malaysia and Japan. This result is in line with the study conducted by Yusof & Majid (2006).

From the study of the Tiger markets bloc, there are two-way causality between South Korea and Malaysia, and Hong Kong and Singapore. However, the results showed that Singapore does not granger cause Malaysia. In other words, time series data of Singapore is not useful in forecasting Malaysia. The result seems consistent with the study conducted by Ng (2002). Furthermore, it is found that Taiwan does not have any unilateral or bilateral causality with Malaysia, South Korea and Hong Kong.

From the study of the Asia Pacific markets bloc, Malaysia has unilateral influence on Australia at a five percent significance level and on New Zealand at ten percent significance level. Therefore, any events that happened in the Malaysia market will affect the markets of Australia and New Zealand as well.

The results of the ASEAN markets bloc showed that there is bilateral causal relationship between Malaysia and Thailand. Malaysia has a smaller influence on Thailand at a five percent significance level while Thailand has a more significant effect on Malaysia at a one percent level. The study is in the line with the study of Chen & Wang (2009). Besides that, two-way cause-effect relationship exists between Indonesia and Philippines. The results also showed that Vietnam and Singapore do not have any causal effect on all the ASEAN markets.

In the Emerging markets bloc, it is found that there is no unilateral or bilateral causality between the Malaysian market and the selected markets which is China and India. The results suggested that Malaysia is a granger cause for China. At the same time, China also granger causes India at a five percent significance level. It is not consistent with the study that was conducted by Karim & Karim (2008), which have shown that there was a two-way relationship between the Chinese and Malaysian stock market.

By looking at the granger causality test for 5 trading blocs, it is found that there is strong bilateral causality between the South Korean equity market under Tiger markets bloc and the Malaysian equity market since the results is at one percent significance level. Besides that, it also found that Thailand under ASEAN markets bloc granger cause Malaysia at 1 percent of significance level whereas Malaysia granger cause Thailand at 5 percent level of significance. In another word, the Thailand market affects the Malaysian equity market more.

Japan and Canada under Developed markets bloc have lesser impact on the changes of the Malaysian equity since it is significant at 5 percent. Besides that, the causal impact of U.S. under the Developed markets bloc on the Malaysian equity market was only significant at 10 percent level of significance but it is approximate to the 5 percent level which is 6.85 percent.

It can be concluded that the most important contributor to the changes of the Malaysian equity market after the 1997 Asian financial crisis are South Korea under Tiger markets bloc and Thailand under ASEAN markets bloc. Other than that, three countries under Developed markets bloc (Japan, Canada and U.S.) also have smaller causal impact on Malaysia equity market. Since the developed markets bloc has more markets affecting the Malaysian market compared to other blocs, it can be said that the developed markets bloc is crucial to the changes of the Malaysian equity market based on the data period of 2000 to 2010.

5.3 Implications

This study is able to provide investors with the latest information regarding the linkages among international stock markets after the financial crisis. Malaysian investors are able to further understand the relationship between the Malaysian stock market and other stock markets internationally after policy changes in different countries due to the crisis. Our study can be served as a guide for Malaysian investors who are considering to invest in other stock markets and also for foreign investors who are interested to invest in the Malaysian stock market as this study provides the patterns of stock prices movement and also log return movement among the Malaysian stock market with other stock markets in the five trading blocs. Furthermore, investors who are currently holding or deciding to hold an internationally diversified portfolio can use our study as a guideline in order to decide on which stock markets are worth further investigation. As this study indicates only the long run co-movement among the stock markets, it only provides an overall picture to investors. As a guide, investors can choose to investigate further into the blocs having a higher degree of long run co-movement with the Malaysian stock market and the blocs having a lower degree of long run co-movement with the Malaysian stock market in order to hold an international portfolio with negative correlation.

Another important implication is that our study can be served as a guide for business people who are currently performing or desire to perform international business transactions as the stock prices movement in different markets are basically reflecting the economic conditions and many other factors in the different countries especially after the period of crisis. Stock prices movement might indirectly reflect the economic conditions such as changes in policy, interest rate, inflation rate, exchange rate and etc. in relative countries. This indicates that the stock markets which are having higher linkages with the Malaysian stock markets might be having similar economic conditions with Malaysia. Malaysian business people can therefore focus on the economic changes in countries that are having high linkages with Malaysia and decide to conduct business transactions with businesses in those countries investigated.

5.4 Limitations and Recommendations of the study

The samples size (from January 2000 to Oct 2010) used in this study are not large enough. Larger sample size will have a higher probability of detecting a statistically significant result whereas a smaller sample size may be misleading and susceptible to error. Therefore, it is recommended that future studies are conducted using period of more than 20 years to get better results.

Since the data comes from different countries, it is unavoidable to have different holidays for each market. The missing value should be replaced by the closing price of the day before the holiday. Hence the sample for each country will contains all days of the week except weekends.

The impact of 2007 financial crisis should also be taken into account. Some past researches, Yang, Kolari, and Min (2002) for example, supported that the degree of integration among countries tends to change over time, especially around periods marked by financial crisis. Therefore, it is recommended that future studies investigate the relationship between the countries with particular attention to the 2007-2008 financial crisis. The data period should be divided into three sub-periods consisting of pre-crisis, during crisis, and post-crisis period to better reflect the cointegration and observe the changes on the linkages between the countries.

Other than that, databases available are insufficient to obtain the relevant journals to support this research study as many journals are not accessible without making payment. Perhaps subscription to database such as EMERALD or an increased range of titles in the existing databases would be of more help to the students and researchers in conducting the study.

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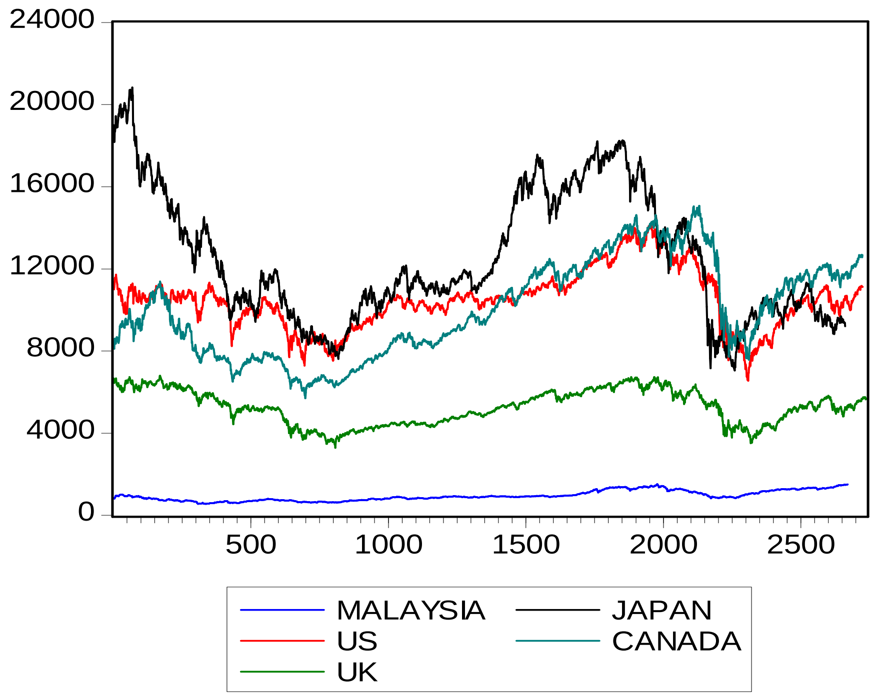
Appendix

Developed Markets

Descriptive Statistics (Common Sample)

	MALAYSIA	US	UK	JAPAN	CANADA
Mean	903.2257	10525.29	5274.078	12789.40	9790.659
Median	884.1800	10522.33	5314.800	11891.61	9211.800
Maximum	1516.220	14164.53	6798.100	20833.21	15073.13
Minimum	553.3400	6547.050	3287.000	7054.980	5695.330
Std. Dev.	217.9044	1466.532	883.9718	3160.475	2399.638
Skewness	0.777128	0.157311	-0.146125	0.351454	0.453003
Kurtosis	2.894948	2.860975	1.737084	2.090350	2.009111
Jarque-Bera	240.1468	11.70830	166.2864	130.7777	178.3929
Probability	0.000000	0.002868	0.000000	0.000000	0.000000
Sum	2145161.	24997565	12525934	30374819	23252815
Sum Sq. Dev.	1.13E+08	5.11E+09	1.86E+09	2.37E+10	1.37E+10
Observations	2375	2375	2375	2375	2375



VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: MALAYSIA US UK JAPAN CANADA

Exogenous variables: C

Date: 04/10/11 Time: 21:43

Sample: 1 2738

Included observations: 2652

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-106313.5	NA	4.56e+28	80.17985	80.19094	80.18386
1	-75274.22	61938.07	3.17e+18	56.79051	**56.85706***	56.81460
2	-75205.59	136.6804	3.07e+18	56.75761	56.87962	56.80177
3	-75162.49	85.67916	3.03e+18	56.74396	56.92143	56.80820
4	-75039.49	244.0658	2.81e+18	56.67005	56.90298	56.75436*
5	-74988.43	101.1207	2.76e+18	56.65040	56.93878	56.75478
6	-74963.34	49.58985	2.76e+18	56.65033	56.99417	56.77479
7	-74926.42	72.83318	2.73e+18	56.64134	57.04065	56.78587
8	-74900.67	50.70446*	2.73e+18*	**56.64078***	57.09554	56.80538
9	-74887.46	25.95299	2.76e+18	56.64967	57.15989	56.83435

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Johansen Cointegration Test

Date: 02/22/11 Time: 23:33
Sample (adjusted): 11 2661
Included observations: 2651 after adjustments
Trend assumption: Linear deterministic trend
Series: MALAYSIA US UK JAPAN CANADA
Lags interval (in first differences): **1 to 9**

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.019520	86.98337	69.81889	0.0012
At most 1	0.006626	34.72337	47.85613	0.4627
At most 2	0.004802	17.10044	29.79707	0.6327
At most 3	0.001614	4.338612	15.49471	0.8744
At most 4	2.10E-05	0.055663	3.841466	0.8135

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.019520	52.26000	33.87687	0.0001
At most 1	0.006626	17.62293	27.58434	0.5267
At most 2	0.004802	12.76183	21.13162	0.4744
At most 3	0.001614	4.282949	14.26460	0.8284
At most 4	2.10E-05	0.055663	3.841466	0.8135

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Granger Causality Test

VEC Granger Causality/Block Exogeneity Wald Tests
Date: 02/22/11 Time: 23:42
Sample: 1 2738
Included observations: 2651

Dependent variable: D(MALAYSIA)

Excluded	Chi-sq	df	Prob.
D(US)	15.92491	9	0.0685
D(UK)	7.407100	9	0.5948
D(JAPAN)	19.19842	9	0.0236
D(CANADA)	20.82867	9	0.0134
All	58.00596	36	0.0115

Dependent variable: D(US)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	8.997082	9	0.4375
D(UK)	22.24394	9	0.0081
D(JAPAN)	11.58335	9	0.2378
D(CANADA)	19.23821	9	0.0232
All	56.86181	36	0.0148

Dependent variable: D(UK)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	12.88621	9	0.1678
D(US)	25.69390	9	0.0023
D(JAPAN)	7.413222	9	0.5942
D(CANADA)	62.43420	9	0.0000
All	126.5914	36	0.0000

Dependent variable: D(JAPAN)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	20.16476	9	0.0169
D(US)	5.956560	9	0.7443
D(UK)	6.059153	9	0.7340
D(CANADA)	17.73323	9	0.0384
All	50.10103	36	0.0593

Dependent variable: D(CANADA)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	11.10936	9	0.2683
D(US)	366.7552	9	0.0000
D(UK)	22.66047	9	0.0070
D(JAPAN)	9.272782	9	0.4125
All	415.6177	36	0.0000

Diagnostic Test

Dependent Variable: D(MALAYSIA)
Method: Least Squares
Date: 02/22/11 Time: 23:43
Sample (adjusted): 11 2662
Included observations: 2652 after adjustments
D(MALAYSIA) = C(1)*(MALAYSIA(-1) + 0.01221937951*US(-1) - 0.3255791271*UK(-1) + 0.09884368013*JAPAN(-1) - 0.08844901831*CANADA(-1) + 283.7468846) + C(2) *D(MALAYSIA(-1)) + C(3)*D(MALAYSIA(-2)) + C(4)*D(MALAYSIA(-3)) + C(5)*D(MALAYSIA(-4)) + C(6) *D(MALAYSIA(-5)) + C(7)*D(MALAYSIA(-6)) + C(8) *D(MALAYSIA(-7)) + C(9)*D(MALAYSIA(-8)) + C(10) *D(MALAYSIA(-9)) + C(11)*D(US(-1)) + C(12)*D(US(-2)) + C(13) *D(US(-3)) + C(14)*D(US(-4)) + C(15)*D(US(-5)) + C(16)*D(US(-6)) + C(17)*D(US(-7)) + C(18)*D(US(-8)) + C(19)*D(US(-9)) + C(20)*D(UK(-1)) + C(21)*D(UK(-2)) + C(22)*D(UK(-3)) + C(23) *D(UK(-4)) + C(24)*D(UK(-5)) + C(25)*D(UK(-6)) + C(26)*D(UK(-7)) + C(27)*D(UK(-8)) + C(28)*D(UK(-9)) +C(29)*D(JAPAN(-1)) + C(30)*D(JAPAN(-2)) + C(31)*D(JAPAN(-3)) + C(32)*D(JAPAN(-4)) + C(33)*D(JAPAN(-5)) + C(34)*D(JAPAN(-6)) + C(35) *D(JAPAN(-7)) + C(36)*D(JAPAN(-8)) + C(37)*D(JAPAN(-9)) + C(38)*D(CANADA(-1)) + C(39)*D(CANADA(-2)) + C(40) *D(CANADA(-3)) + C(41)*D(CANADA(-4)) + C(42)*D(CANADA(-5)) + C(43)*D(CANADA(-6)) + C(44)*D(CANADA(-7)) + C(45) *D(CANADA(-8)) + C(46)*D(CANADA(-9)) + C(47)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.000768	0.000840	0.914900	0.3603
C(2)	0.127474	0.019811	6.434439	0.0000
C(3)	-0.026265	0.019941	-1.317131	0.1879
C(4)	0.057602	0.019959	2.886093	0.0039
C(5)	0.011559	0.019960	0.579092	0.5626
C(6)	-0.019877	0.019940	-0.996806	0.3190
C(7)	-0.024992	0.019943	-1.253181	0.2103
C(8)	-0.000994	0.019891	-0.049961	0.9602
C(9)	0.009718	0.019882	0.488775	0.6250
C(10)	0.014341	0.019651	0.729790	0.4656
C(11)	-0.000188	0.001383	-0.135979	0.8918
C(12)	-0.000466	0.001392	-0.335053	0.7376
C(13)	0.003598	0.001408	2.555925	0.0106
C(14)	-0.000453	0.001474	-0.307530	0.7585
C(15)	-0.001042	0.001501	-0.693895	0.4878
C(16)	-0.002914	0.001508	-1.931598	0.0535
C(17)	-0.001485	0.001517	-0.978669	0.3278
C(18)	-0.001395	0.001502	-0.928785	0.3531
C(19)	-0.003156	0.001471	-2.145481	0.0320
C(20)	-0.000424	0.002691	-0.157705	0.8747
C(21)	0.001225	0.002700	0.453644	0.6501
C(22)	0.002141	0.002694	0.794593	0.4269
C(23)	-0.004247	0.002696	-1.575391	0.1153
C(24)	-0.001546	0.002692	-0.574349	0.5658
C(25)	-0.001532	0.002692	-0.569147	0.5693
C(26)	-0.001354	0.002692	-0.502861	0.6151
C(27)	0.004210	0.002683	1.569285	0.1167
C(28)	0.002226	0.002663	0.835895	0.4033
C(29)	0.003013	0.000931	3.236592	0.0012

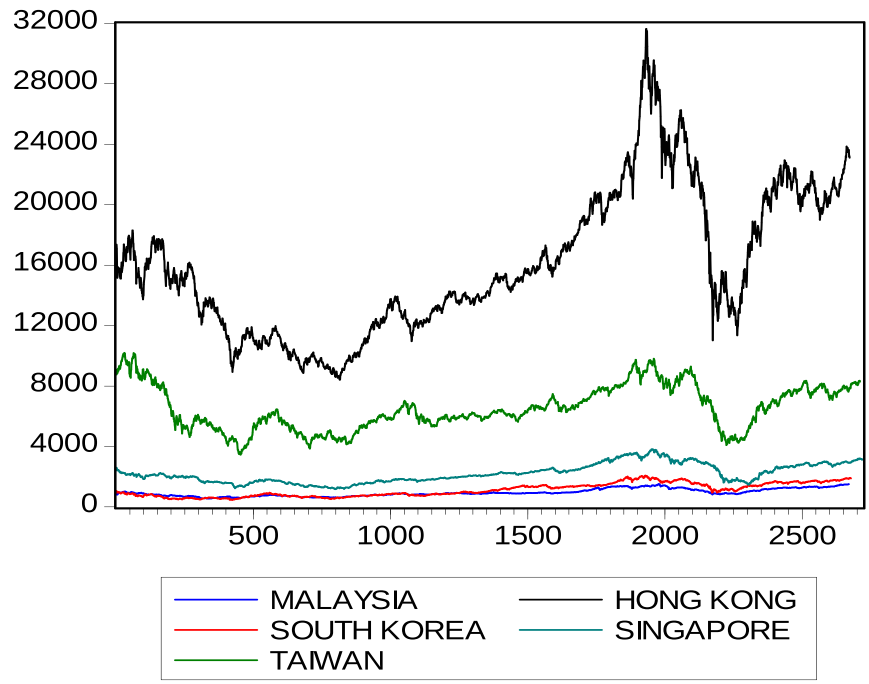
C(30)	0.001263	0.000933	1.353539	0.1760
C(31)	0.001324	0.000933	1.419078	0.1560
C(32)	-0.000142	0.000934	-0.151703	0.8794
C(33)	-0.000575	0.000934	-0.615516	0.5383
C(34)	-0.000745	0.000933	-0.798889	0.4244
C(35)	0.000709	0.000931	0.761251	0.4466
C(36)	0.001251	0.000931	1.344394	0.1789
C(37)	0.001266	0.000929	1.362334	0.1732
C(38)	-0.003666	0.001460	-2.511487	0.0121
C(39)	0.000172	0.001479	0.116446	0.9073
C(40)	0.003329	0.001491	2.232392	0.0257
C(41)	0.002024	0.001482	1.365636	0.1722
C(42)	0.001906	0.001476	1.291612	0.1966
C(43)	0.003057	0.001451	2.107301	0.0352
C(44)	0.000156	0.001391	0.112425	0.9105
C(45)	-0.001178	0.001380	-0.853537	0.3934
C(46)	0.001307	0.001376	0.949715	0.3423
C(47)	0.190049	0.173437	1.095780	0.2733

R-squared	0.047432	Mean dependent var	0.203254
Adjusted R-squared	0.030611	S.D. dependent var	9.008314
S.E. of regression	8.869365	Akaike info criterion	7.220647
Sum squared resid	204924.0	Schwarz criterion	7.324909
Log likelihood	-9527.578	Durbin-Watson stat	1.997249

Tiger Markets

Descriptive Statistics (Common Sample)

	MALAYSIA	S_KOREAN	TAIWAN	SINGAPORE	HONG_KONG
Mean	903.2257	1047.100	6374.046	2131.882	15329.99
Median	884.1800	907.4300	6060.460	2003.660	14408.94
Maximum	1516.220	2064.850	10202.20	3831.190	31638.22
Minimum	553.3400	468.7600	3446.260	1170.850	8409.010
Std. Dev.	217.9044	406.7900	1475.521	615.6734	4592.111
Skewness	0.777128	0.603276	0.543399	0.822019	0.969052
Kurtosis	2.894948	2.263110	2.521466	2.854547	3.596955
Jarque-Bera	240.1468	197.7953	139.5435	269.5643	406.9762
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	2145161.	2486862.	15138360	5063220.	36408729
Sum Sq. Dev.	1.13E+08	3.93E+08	5.17E+09	9.00E+08	5.01E+10
Observations	2375	2375	2375	2375	2375



VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: MALAYSIA SOUTH_KOREA TAIWAN SINGAPORE HONG_KONG

Exogenous variables: C

Date: 01/26/11 Time: 20:17

Sample: 1 2720

Included observations: 2662

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-98725.05	NA	1.13e+26	74.17735	74.18840	74.18135
1	-68838.52	59638.34	2.04e+16	51.74194	**51.80828***	51.76594
2	-68756.70	162.9547	1.95e+16	51.69925	51.82088	51.74327
3	-68698.71	115.2903	1.90e+16	51.67446	51.85138	51.73848*
4	-68667.87	61.18789	1.90e+16	51.67008	51.90228	51.75411
5	-68617.83	99.10025	1.86e+16	51.65126	51.93875	51.75530
6	-68570.27	94.00823	1.83e+16	51.63432	51.97709	51.75836
7	-68550.36	39.29429	1.84e+16	51.63813	52.03619	51.78219
8	-68513.15	73.26096*	1.82e+16*	**51.62897***	52.08231	51.79303

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Johansen Cointegration test

Date: 01/26/11 Time: 21:01
Sample (adjusted): 3 2670
Included observations: 2668 after adjustments
Trend assumption: Linear deterministic trend
Series: MALAYSIA SINGAPORE SOUTH_KOREA TAIWAN HONG_KONG
Lags interval (in first differences): **1 to 1**

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.025745	146.7938	69.81889	0.0000
At most 1 *	0.012937	77.20772	47.85613	0.0000
At most 2 *	0.010571	42.46700	29.79707	0.0011
At most 3	0.005125	14.11276	15.49471	0.0799
At most 4	0.000151	0.403287	3.841466	0.5254

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.025745	69.58613	33.87687	0.0000
At most 1 *	0.012937	34.74072	27.58434	0.0051
At most 2 *	0.010571	28.35424	21.13162	0.0040
At most 3	0.005125	13.70947	14.26460	0.0610
At most 4	0.000151	0.403287	3.841466	0.5254

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Granger Causality Test

VEC Granger Causality/Block Exogeneity Wald Tests
Date: 02/15/11 Time: 18:33
Sample: 1 2720
Included observations: 2668

Dependent variable: D(MALAYSIA)

Excluded	Chi-sq	df	Prob.
D(HONG_KONG)	2.026040	1	0.1546
D(SOUTH_KOREA)	8.038597	1	0.0046
D(SINGAPORE)	0.096124	1	0.7565
D(TAIWAN)	0.228543	1	0.6326
All	10.43251	4	0.0337

Dependent variable: D(HONG_KONG)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	15.99350	1	0.0001
D(SOUTH_KOREA)	23.47630	1	0.0000
D(SINGAPORE)	1.004790	1	0.3162
D(TAIWAN)	0.353077	1	0.5524
All	44.19963	4	0.0000

Dependent variable: D(SOUTH_KOREA)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	45.46243	1	0.0000
D(HONG_KONG)	6.774703	1	0.0092
D(SINGAPORE)	3.634550	1	0.0566
D(TAIWAN)	1.772941	1	0.1830
All	60.16349	4	0.0000

Dependent variable: D(SINGAPORE)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	0.441301	1	0.5065
D(HONG_KONG)	2.767867	1	0.0962
D(SOUTH_KOREA)	3.476919	1	0.0622
D(TAIWAN)	1.491657	1	0.2220
All	8.072834	4	0.0889

Dependent variable: D(TAIWAN)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	0.151619	1	0.6970
D(HONG_KONG)	0.005081	1	0.9432
D(SOUTH_KOREA)	0.017497	1	0.8948
D(SINGAPORE)	0.004215	1	0.9482
All	0.173939	4	0.9964

Diagnostic Test

Dependent Variable: D(MALAYSIA)
Method: Least Squares
Date: 04/12/11   Time: 23:52
Sample (adjusted): 3 2670
Included observations: 2668 after adjustments
D(MALAYSIA) = C(1)*(MALAYSIA(-1) + 1.20958318
*SOUTH_KOREA(-1) + 0.06958824796*TAIWAN(-1) -
1.428343913*SINGAPORE(-1) + 0.01593289959*HONG_KONG(
-1) + 135.3290069) + C(2)*D(MALAYSIA(-1)) + C(3)
*D(SOUTH_KOREA(-1)) + C(4)*D(TAIWAN(-1)) + C(5)
*D(SINGAPORE(-1)) + C(6)*D(HONG_KONG(-1)) + C(7)

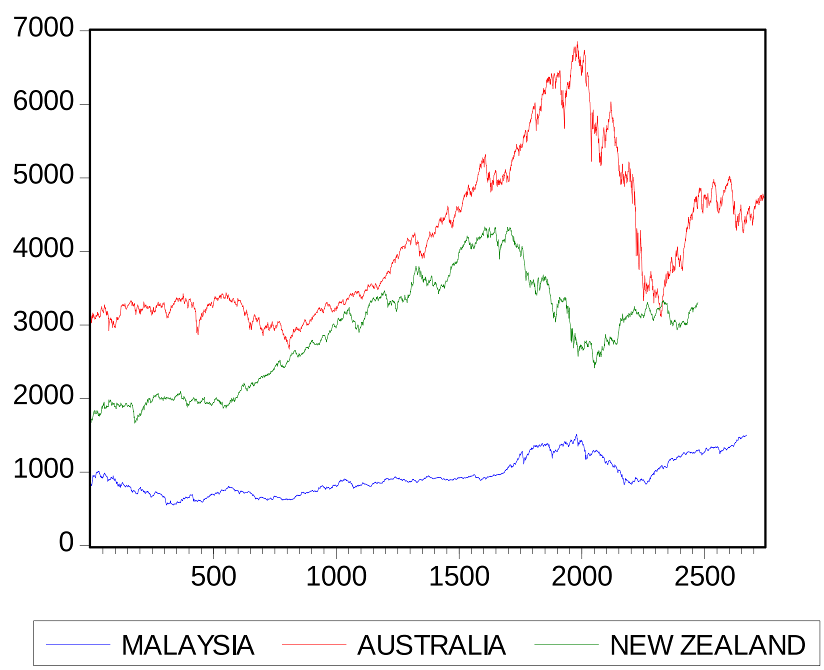
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.001132	0.000496	2.281051	0.0226
C(2)	0.141008	0.019291	7.309342	0.0000
C(3)	0.026373	0.009302	2.835242	0.0046
C(4)	0.000819	0.001713	0.478061	0.6326
C(5)	-0.001802	0.005813	-0.310039	0.7566
C(6)	0.000855	0.000601	1.423390	0.1547
C(7)	0.207669	0.173277	1.198480	0.2308

R-squared	0.028941	Mean dependent var	0.252196
Adjusted R-squared	0.026751	S.D. dependent var	9.067717
S.E. of regression	8.945609	Akaike info criterion	7.222823
Sum squared resid	212943.6	Schwarz criterion	7.238274
Log likelihood	-9628.246	Durbin-Watson stat	1.995954

Asia Pacific Markets

Descriptive Statistics (Common Sample)

	MALAYSIA	AUSTRALIA	NEW_ZEALAND
Mean	903.2257	4068.827	2887.467
Median	884.1800	3495.600	2952.020
Maximum	1516.220	6853.600	4333.240
Minimum	553.3400	2673.280	1665.040
Std. Dev.	217.9044	1095.854	741.7820
Skewness	0.777128	0.871415	0.127809
Kurtosis	2.894948	2.447918	1.908500
Jarque-Bera	240.1468	330.7438	124.3622
Probability	0.000000	0.000000	0.000000
Sum	2145161.	9663465.	6857733.
Sum Sq. Dev.	1.13E+08	2.85E+09	1.31E+09
Observations	2375	2375	2375



VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: MALAYSIA AUSTRALIA NEW_ZEALAND
Exogenous variables: C
Date: 01/12/11 Time: 01:54
Sample: 1 2741
Included observations: 2464

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-55279.90	NA	6.17e+15	44.87248	44.87956	44.87505
1	-32991.21	44505.01	86416636	26.78832	26.81662*	26.79860
2	-32957.08	68.06504	84671828	26.76792	26.81744	26.78591*
3	-32948.27	17.56241	84684414	26.76807	26.83881	26.79377
4	-32938.04	20.34761	84600077*	26.76708*	26.85903	26.80048
5	-32932.85	10.30681	84862332	26.77017	26.88334	26.81129
6	-32925.03	15.52448	84943506	26.77113	26.90552	26.81995
7	-32921.11	7.762429	85294791	26.77525	26.93087	26.83179
8	-32910.88	20.26543*	85209279	26.77425	26.95108	26.83850

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Johansen Cointegration Test

Date: 01/12/11 Time: 02:18
Sample (adjusted): 7 2472
Included observations: 2466 after adjustments
Trend assumption: Linear deterministic trend
Series: MALAYSIA AUSTRALIA NEW_ZEALAND
Lags interval (in first differences): **1 to 5**

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.010118	37.65415	29.79707	0.0051
At most 1	0.003206	12.57522	15.49471	0.1313
At most 2 *	0.001887	4.657388	3.841466	0.0309

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.010118	25.07893	21.13162	0.0132
At most 1	0.003206	7.917831	14.26460	0.3871
At most 2 *	0.001887	4.657388	3.841466	0.0309

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Granger Causality Test

VEC Granger Causality/Block Exogeneity Wald Tests
Date: 01/12/11 Time: 10:48
Sample: 1 2741
Included observations: 2466

Dependent variable: D(MALAYSIA)

Excluded	Chi-sq	df	Prob.
D(AUSTRALIA)	2.348100	5	0.7992
D(NEW_ZEALAND)	6.695921	5	0.2443
All	9.134122	10	0.5194

Dependent variable: D(AUSTRALIA)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	12.96114	5	0.0237
D(NEW_ZEALAND)	7.412188	5	0.1917
All	20.36030	10	0.0260

Dependent variable: D(NEW_ZEALAND)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	10.03667	5	0.0742
D(AUSTRALIA)	4.878017	5	0.4309
All	15.18422	10	0.1255

Diagnostic Test

Dependent Variable: D(MALAYSIA)
Method: Least Squares
Date: 01/12/11 Time: 11:07
Sample (adjusted): 7 2473
Included observations: 2467 after adjustments
D(MALAYSIA) = C(1)*(MALAYSIA(-1) - 0.328213211*AUSTRALIA(-1)
+ 0.2493699604*NEW_ZEALAND(-1) - 301.4082581) + C(2)
*D(MALAYSIA(-1)) + C(3)*D(MALAYSIA(-2)) + C(4)
*D(MALAYSIA(-3)) + C(5)*D(MALAYSIA(-4)) + C(6)
*D(MALAYSIA(-5)) + C(7)*D(AUSTRALIA(-1)) + C(8)
*D(AUSTRALIA(-2)) + C(9)*D(AUSTRALIA(-3)) + C(10)
*D(AUSTRALIA(-4)) + C(11)*D(AUSTRALIA(-5)) + C(12)
*D(NEW_ZEALAND(-1)) + C(13)*D(NEW_ZEALAND(-2)) + C(14)
*D(NEW_ZEALAND(-3)) + C(15)*D(NEW_ZEALAND(-4)) + C(16)
*D(NEW_ZEALAND(-5)) + C(17)

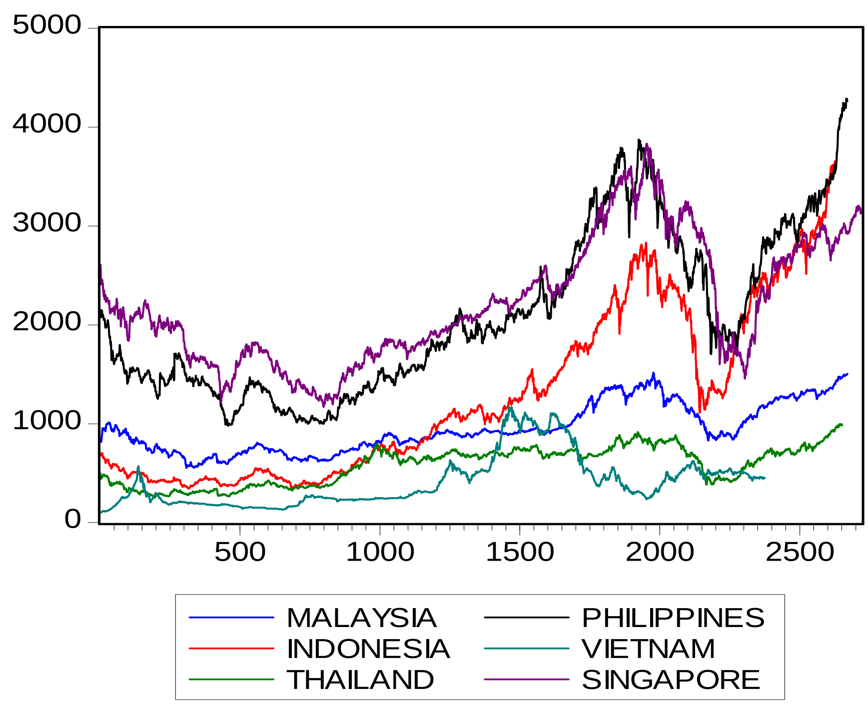
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.002196	0.000913	2.406620	0.0162
C(2)	0.139747	0.020236	6.906006	0.0000
C(3)	-0.021409	0.020427	-1.048108	0.2947
C(4)	0.061602	0.020432	3.014979	0.0026
C(5)	0.007969	0.020446	0.389757	0.6968
C(6)	-0.027089	0.020260	-1.337067	0.1813
C(7)	-0.004303	0.004012	-1.072545	0.2836
C(8)	-0.000148	0.004016	-0.036755	0.9707
C(9)	-0.000410	0.004013	-0.102210	0.9186
C(10)	0.003868	0.004012	0.964122	0.3351
C(11)	-0.000855	0.004009	-0.213293	0.8311
C(12)	-0.002365	0.008159	-0.289807	0.7720
C(13)	-0.004447	0.008171	-0.544179	0.5864
C(14)	0.009087	0.008175	1.111513	0.2665
C(15)	0.013469	0.008176	1.647426	0.0996
C(16)	-0.012092	0.008153	-1.483097	0.1382
C(17)	0.143108	0.182579	0.783815	0.4332

R-squared	0.031184	Mean dependent var	0.173879
Adjusted R-squared	0.024857	S.D. dependent var	9.151872
S.E. of regression	9.037411	Akaike info criterion	7.247490
Sum squared resid	200103.3	Schwarz criterion	7.287531
Log likelihood	-8922.779	Durbin-Watson stat	2.004273

ASEAN Markets

Descriptive Statistics (Common Sample)

	MALAYSIA	INDONESIA	THAILAND	PHILIPPINES	SINGAPORE	VIETNAM
Mean	903.2257	1114.677	555.7433	1939.741	2131.882	406.7942
Median	884.1800	939.1510	621.9500	1807.490	2003.660	311.7200
Maximum	1516.220	2830.263	915.0300	3873.500	3831.190	1170.670
Minimum	553.3400	337.4750	250.6000	979.3400	1170.850	100.0000
Std. Dev.	217.9044	711.1281	184.0413	726.2147	615.6734	255.4859
Skewness	0.777128	0.752096	-0.107979	0.846615	0.822019	1.279304
Kurtosis	2.894948	2.295762	1.561338	2.810084	2.854547	3.884023
Jarque-Bera	240.1468	272.9811	209.4341	287.2856	269.5643	725.1638
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	2145161.	2647359.	1319890.	4606886.	5063220.	966136.2
Sum Sq. Dev.	1.13E+08	1.20E+09	80410262	1.25E+09	9.00E+08	1.55E+08
Observations	2375	2375	2375	2375	2375	2375



VAR Lag Order Selection Criteria

VAR Lag Order Selection
Criteria
Endogenous variables: MALAYSIA INDONESIA THAILAND
PHILIPPINES VIETNAM SINGAPORE
Exogenous variables: C
Date: 01/12/11 Time: 18:08
Sample: 1 2720
Included observations: 2367

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-94906.64	NA	2.72e+27	80.19657	80.21119	80.20189
1	-59183.57	71234.84	2.18e+14	50.04273	50.14510	50.08000
2	-59006.06	353.0811	1.93e+14	49.92316	**50.11328***	49.99237*
3	-58965.59	80.28860	1.93e+14*	**49.91938***	50.19725	50.02054
4	-58935.35	59.82770	1.94e+14	49.92425	50.28987	50.05736
5	-58894.27	81.08206	1.93e+14	49.91996	50.37332	50.08501
6	-58860.35	66.79832	1.93e+14	49.92171	50.46282	50.11871
7	-58823.61	72.14188	1.93e+14	49.92109	50.54994	50.15003
8	-58791.38	63.12565*	1.94e+14	49.92427	50.64088	50.18516

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Johansen Cointegration Test

Date: 01/12/11 Time: 18:32
Sample (adjusted): 4 2375
Included observations: 2372 after adjustments
Trend assumption: Linear deterministic trend
Series: MALAYSIA INDONESIA THAILAND PHILIPPINES VIETNAM SINGAPORE
Lags interval (in first differences): **1 to 2**

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value
None *	0.031168	176.4956	95.75366
At most 1 *	0.021813	101.3896	69.81889
At most 2 *	0.013978	49.07687	47.85613
At most 3	0.004728	15.68754	29.79707
At most 4	0.001593	4.445782	15.49471
At most 5	0.000280	0.663143	3.841466

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value
None *	0.031168	75.10599	40.07757
At most 1 *	0.021813	52.31276	33.87687
At most 2 *	0.013978	33.38933	27.58434
At most 3	0.004728	11.24175	21.13162
At most 4	0.001593	3.782640	14.26460
At most 5	0.000280	0.663143	3.841466

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Granger Causality Test

VEC Granger Causality/Block Exogeneity Wald Tests
Date: 01/12/11 Time: 18:48
Sample: 1 2720
Included observations: 2372

Dependent variable: D(MALAYSIA)

Excluded	Chi-sq	df	Prob.
D(INDONESIA)	2.724156	2	0.2561
D(THAILAND)	12.23802	2	0.0022
D(PHILIPPINES)	0.907696	2	0.6352
D(VIETNAM)	0.696804	2	0.7058
D(SINGAPORE)	1.540028	2	0.4630
All	17.49783	10	0.0640

Dependent variable: D(INDONESIA)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	0.574339	2	0.7504
D(THAILAND)	0.393409	2	0.8214
D(PHILIPPINES)	6.367600	2	0.0414
D(VIETNAM)	3.647082	2	0.1615
D(SINGAPORE)	0.875645	2	0.6454
All	12.28673	10	0.2663

Dependent variable: D(THAILAND)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	6.527609	2	0.0382
D(INDONESIA)	4.656571	2	0.0975
D(PHILIPPINES)	2.765098	2	0.2509
D(VIETNAM)	9.506567	2	0.0086
D(SINGAPORE)	0.903787	2	0.6364
All	23.57960	10	0.0088

Dependent variable: D(PHILIPPINES)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	0.123768	2	0.9400
D(INDONESIA)	7.105344	2	0.0286
D(THAILAND)	8.773316	2	0.0124
D(VIETNAM)	0.655342	2	0.7206
D(SINGAPORE)	2.567434	2	0.2770
All	19.07462	10	0.0393

Dependent variable: D(VIETNAM)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	2.759609	2	0.2516
D(INDONESIA)	0.779418	2	0.6773
D(THAILAND)	1.037929	2	0.5951
D(PHILIPPINES)	2.587325	2	0.2743
D(SINGAPORE)	3.425229	2	0.1804
All	10.63180	10	0.3869

Dependent variable: D(SINGAPORE)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	0.181879	2	0.9131
D(INDONESIA)	5.843159	2	0.0538
D(THAILAND)	0.051872	2	0.9744
D(PHILIPPINES)	2.937301	2	0.2302
D(VIETNAM)	0.890947	2	0.6405
All	10.11580	10	0.4304

Diagnostic Test

Dependent Variable: D(MALAYSIA)

Method: Least Squares

Date: 01/12/11 Time: 18:50

Sample (adjusted): 4 2376

Included observations: 2373 after adjustments

D(MALAYSIA) = C(1)*(MALAYSIA(-1) + 0.593504729*INDONESIA(-1) - 0.7396642986*THAILAND(-1)

- 4.012749406*PHILIPPINES(-1) - 0.1433163888*VIETNAM(-1) + 4.020107583*SINGAPORE(-1) -1882.462598) + C(2)*D(MALAYSIA(-1)) + C(3)*D(MALAYSIA(-2)) + C(4)*D(INDONESIA(-1)) + C(5)*D(INDONESIA(-2)) +

C(6)*D(THAILAND(-1)) + C(7)*D(THAILAND(-2)) +

C(8)*D(PHILIPPINES(-1)) + C(9)*D(PHILIPPINES(-2)) +

C(10)*D(VIETNAM(-1)) + C(11)*D(VIETNAM(-2)) +

C(12)*D(SINGAPORE(-1)) + C(13)*D(SINGAPORE(-2)) + C(14)

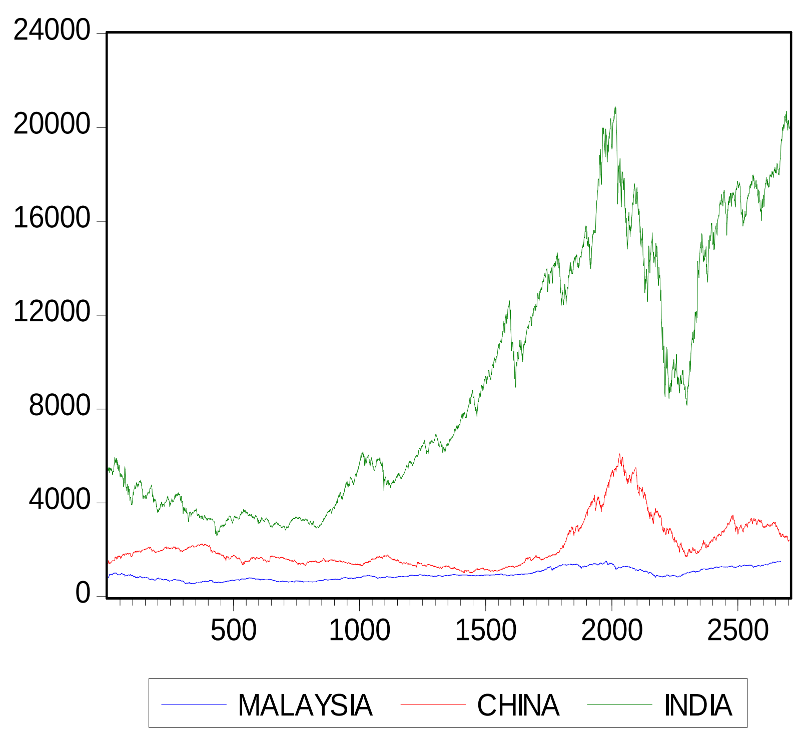
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.000705	0.000222	-3.176728	0.0015
C(2)	0.143971	0.020566	7.000503	0.0000
C(3)	-0.025323	0.020544	-1.232625	0.2178
C(4)	0.004510	0.008596	0.524634	0.5999
C(5)	0.013228	0.008620	1.534502	0.1250
C(6)	0.072959	0.022354	3.263724	0.0011
C(7)	-0.029394	0.022312	-1.317402	0.1878
C(8)	-0.001729	0.006075	-0.284510	0.7760
C(9)	0.005457	0.006079	0.897766	0.3694
C(10)	-0.017320	0.021279	-0.813912	0.4158
C(11)	0.008129	0.021286	0.381904	0.7026
C(12)	1.59E-05	0.006259	0.002546	0.9980
C(13)	0.007677	0.006244	1.229567	0.2190
C(14)	0.117045	0.188348	0.621429	0.5344

R-squared	0.033888	Mean dependent var	0.151155
Adjusted R-squared	0.028564	S.D. dependent var	9.293299
S.E. of regression	9.159611	Akaike info criterion	7.273367
Sum squared resid	197916.5	Schwarz criterion	7.307419
Log likelihood	-8615.850	Durbin-Watson stat	1.996164

Emerging Markets

Descriptive Statistics (Common Sample)

	MALAYSIA	INDIA	CHINA
Mean	903.2257	7898.566	2043.692
Median	884.1800	5880.350	1670.670
Maximum	1516.220	20873.33	6092.060
Minimum	553.3400	2600.120	1011.500
Std. Dev.	217.9044	4758.927	1043.254
Skewness	0.777128	0.820650	1.976036
Kurtosis	2.894948	2.469341	6.243137
Jarque-Bera	240.1468	294.4468	2586.455
Probability	0.000000	0.000000	0.000000
Sum	2145161.	18759095	4853769.
Sum Sq. Dev.	1.13E+08	5.38E+10	2.58E+09
Observations	2375	2375	2375



VAR Lag Order Selection Criteria

VAR Lag Order Selection
Criteria
Endogenous variables: MALAYSIA CHINA
INDIA
Exogenous variables: C
Date: 02/22/11 Time: 23:21
Sample: 1 2705
Included observations: 2662

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-63615.17	NA	1.15e+17	47.79727	47.80390	47.79967
1	-41244.70	44673.70	5.81e+09	30.99677	31.02331	31.00637
2	-41208.38	72.45006	5.69e+09	30.97624	**31.02268***	30.99305*
3	-41198.42	19.85252	5.69e+09	30.97552	31.04186	30.99953
4	-41184.73	27.23136	5.67e+09	30.97200	31.05825	31.00321
5	-41175.59	18.18788	5.67e+09	30.97189	31.07804	31.01030
6	-41159.46	32.01299	5.64e+09	30.96654	31.09259	31.01216
7	-41150.04	18.68820*	5.64e+09*	**30.96622***	31.11218	31.01904
8	-41146.01	7.989903	5.66e+09	30.96995	31.13581	31.02998

* indicates lag order selected by the
criterion
LR: sequential modified LR test statistic (each test at
5% level)
FPE: Final prediction error
AIC: Akaike information
criterion
SC: Schwarz information
criterion
HQ: Hannan-Quinn information criterion

Johansen Cointegration Test

Date: 02/22/11 Time: 23:33
Sample (adjusted): 10 2670
Included observations: 2661 after adjustments
Trend assumption: Linear deterministic trend
Series: MALAYSIA CHINA INDIA
Lags interval (in first differences): **1 to 8**

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.016204	62.65913	29.79707	0.0000
At most 1 *	0.006722	19.18703	15.49471	0.0132
At most 2	0.000465	1.238548	3.841466	0.2658

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.016204	43.47210	21.13162	0.0000
At most 1 *	0.006722	17.94848	14.26460	0.0125
At most 2	0.000465	1.238548	3.841466	0.2658

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Granger Causality Test

VEC Granger Causality/Block Exogeneity Wald Tests
Date: 02/22/11 Time: 23:56
Sample: 1 2705
Included observations: 2661

Dependent variable: D(MALAYSIA)

Excluded	Chi-sq	df	Prob.
D(CHINA)	11.94909	8	0.1535
D(INDIA)	2.321836	8	0.9695
All	14.83447	16	0.5368

Dependent variable: D(CHINA)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	19.79381	8	0.0111
D(INDIA)	12.22326	8	0.1415
All	31.82849	16	0.0105

Dependent variable: D(INDIA)

Excluded	Chi-sq	df	Prob.
D(MALAYSIA)	6.519762	8	0.5892
D(CHINA)	17.93257	8	0.0217
All	24.78956	16	0.0736

Diagnostic Test

Dependent Variable: D(MALAYSIA)
Method: Least Squares
Date: 02/23/11 Time: 00:02
Sample (adjusted): 10 2670
Included observations: 2661 after adjustments
D(MALAYSIA) = C(1)*(MALAYSIA(-1) - 0.1098650876*CHINA(-1) - 0.02418337953*INDIA(-1) - 498.1825379) + C(2)*D(MALAYSIA(-1)) + C(3)*D(MALAYSIA(-2)) + C(4)*D(MALAYSIA(-3)) + C(5) *D(MALAYSIA(-4)) + C(6)*D(MALAYSIA(-5)) + C(7) *D(MALAYSIA(-6)) + C(8)*D(MALAYSIA(-7)) + C(9) *D(MALAYSIA(-8)) + C(10)*D(CHINA(-1)) + C(11)*D(CHINA(-2)) + C(12)*D(CHINA(-3)) + C(13)*D(CHINA(-4)) + C(14)*D(CHINA(-5)) + C(15)*D(CHINA(-6)) + C(16)*D(CHINA(-7)) + C(17)*D(CHINA(-8)) + C(18)*D(INDIA(-1)) + C(19)*D(INDIA(-2)) + C(20)*D(INDIA(-3)) + C(21)*D(INDIA(-4)) + C(22)*D(INDIA(-5)) + C(23)*D(INDIA(-6)) + C(24)*D(INDIA(-7)) + C(25)*D(INDIA(-8)) + C(26)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.002386	0.001425	1.674046	0.0942
C(2)	0.140583	0.019563	7.186112	0.0000
C(3)	-0.028847	0.019712	-1.463466	0.1435
C(4)	0.056107	0.019693	2.849121	0.0044
C(5)	0.011663	0.019704	0.591906	0.5540
C(6)	-0.024736	0.019683	-1.256712	0.2090
C(7)	-0.023964	0.019680	-1.217658	0.2235
C(8)	0.003480	0.019652	0.177078	0.8595
C(9)	0.014715	0.019470	0.755774	0.4499
C(10)	-0.001725	0.003779	-0.456570	0.6480
C(11)	0.007224	0.003780	1.911239	0.0561
C(12)	-0.005307	0.003783	-1.402914	0.1608
C(13)	-0.001614	0.003783	-0.426728	0.6696
C(14)	0.001522	0.003781	0.402598	0.6873
C(15)	-0.007427	0.003781	-1.964227	0.0496
C(16)	0.005750	0.003778	1.521854	0.1282
C(17)	0.001434	0.003784	0.378943	0.7048
C(18)	0.000377	0.000947	0.397470	0.6911
C(19)	0.000578	0.000949	0.609356	0.5423
C(20)	-0.000227	0.000948	-0.239394	0.8108
C(21)	-0.000629	0.000946	-0.664665	0.5063
C(22)	-0.000575	0.000947	-0.607485	0.5436
C(23)	-0.000526	0.000947	-0.555362	0.5787
C(24)	0.000539	0.000949	0.567349	0.5705
C(25)	-0.000372	0.000946	-0.393620	0.6939
C(26)	0.179149	0.173377	1.033287	0.3016

R-squared	0.031217	Mean dependent var	0.207531
Adjusted R-squared	0.022026	S.D. dependent var	8.995264
S.E. of regression	8.895650	Akaike info criterion	7.218724
Sum squared resid	208514.4	Schwarz criterion	7.276240
Log likelihood	-9578.513	Durbin-Watson stat	1.998676