DOES DOMESTIC STOCK MARKET RETURNS DEPENDS ON THE STOCK MARKET OF ITS MAJOR TRADING PARTNERS? : EVIDENCE FROM MALAYSIA

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DECLARATION

We hereby declare that:

(1) This undergraduate 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 other institutes of learning.

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

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LIST OF ABBREVIATIONS

ACFTA	ASEAN China Free Trade Area
APT	Arbitrage Pricing Theory
ARCH	Autoregressive Conditional Heteroscedasticity
ARDL	Autoregressive Distributed Lag
ASEAN	Association of Southeast Asian Nations
CAPM	Capital Asset Pricing Theory
DAX	Deutscher Aktien Index
DJIA	Dow Jones Industrial Average
ECM	Error Correction Model
EMH	Efficient Market Hypothesis
FORES	Floor Order Routing and Execution System
FTSE 100	Financial Times Stock Exchange 100 Index
GARCH	Generalized Autoregressive Conditional Heteroskedasticity
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
IAPM	International Asset Pricing Model
JJ	Johansen and Juselius
KLCI	Kuala Lumpur Stock Exchange Composite Index
KLSE	Kuala Lumpur Stock Exchange
KLSEB	Kuala Lumpur Stock Exchange Berhad

NIKKEI	Nihon Keizai Shimbun
NYSE	New York Stock Exchange
OLS	Ordinary Least Squares
SES	Stock Exchange of Singapore
SGX	Singapore Exchange Limited
SSE	Shanghai Stock Exchange
STI	Straits Times Index
S&P 500	Standard and Poor's 500
TOPIX	Tokyo Stock Price Index
UK	United Kingdom
U.S.	United States
VAR	Vector Autoregression
VECM	Vector Error Correction Model

PREFACE

In the era of globalization, there are many ways for investors to conduct analysis when making investment decisions and one of the methods is forecast the stock market trend. Whenever reasonable predictions with less bias on the stock market performance are generated, great profit will be made. In order to earn great returns, investors not only invest in single market but also invest in several markets at the same time. However, under the influence of globalization, financial markets in today's world are getting better with cross-border information exchange, financial reforms, and advanced technology. These elements have increased the ability to respond immediately to news and shocks coming from the rest of the world, indicating that external factors do affect the performance of stock market. Therefore, the relationship of securities around the world has created and increased the interest among academia, investors, and managers of international fund to carry out the investigation. With a better understanding about the stock market integration relationship, the works on analysis by investors can be enhanced and thus maximize their investment returns in the stock market.

Besides, latest issues such as China stock market crash, Brexit and success of Donald Trump in United States presidential election seemed to bring negative effect to world stock markets including Malaysia. However, researchers concluded different opinions on the effect of major trading partners to the domestic stock market. Hence, more empirical evidences regarding this topic should be provided.

ABSTRACT

In this globalization era, as an open economy, Malaysia has always been relying on foreign trade to realize its goals of economic development. The international trading relationship suggests that there is economic integration. The presence of economic integration provides a channel for financial integration. Besides, latest issues like China stock market crash, Brexit and success of Donald Trump in presidential election seemed to bring negative effect to world stock markets including Malaysia. However, researchers concluded different opinions on the effect of major trading partners to the domestic stock market. Hence, more empirical evidences regarding this topic should be provided. With better understanding about the integration relationship between the stock markets, the investors' works on stock market forecasting or analysis can be enhanced and thus greater returns from stock markets. GARCH model has been applied in this study to examine the relationship between Malaysia stock market returns and its major trading partners' stock markets. Empirical results provided that Singapore, China and Japan brought positive effect on Malaysia stock market returns while only United States brought negative effect on Malaysia stock market returns.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

This chapter provides the overview of the research background, problem statement, research objectives, research questions, significances of research project and outlines of each chapter.

1.1 Research Background

Globalization is a process of interaction and integration among the human beings, companies, and governments of different countries. It is spurred by international trade and investment and backed by information technology. The growing interdependence of countries is resulted from the increasing integration of trade, finance, human beings, and ideology in one global marketplace.

There are a number of advantages brought by globalization to the stock market. The barriers to transactions of capital in the stock market among the nations had been reduced due to globalization. Reduction of the barriers had caused an increment in the connections between the flows of stock markets in various nations and consequently led to global economic growth. In addition, globalization will bring greater

competition to the stock market as it will attract not merely new investors and firms from the local country, but also the investors and firms from foreign countries. Furthermore, the amount of investments will also rise as a result from globalization as there is lower boundary and greater chance to attract short-term and long-term investments.

In this globalization era, as an open economy, Malaysia has always been relying on foreign trade to realize its goals of economic development. Malaysia's total trade, has constituted for a considerable portion of its gross domestic product (GDP), pointing that international trade is an important part in the development of Malaysian economy. According to World Bank Data from 2006 to 2015, China, Singapore, United States and Japan are the primary trading partners of Malaysia. The following Table 1.1 and Table 1.2 show the percentage of import and export by these top trading partners.

Table 1.1 Percentage of import by top partners (%)

Year	Singapore	Japan	United States	China
2006	11.68	13.22	12.53	12.11
2007	11.44	12.91	10.80	12.90
2008	10.93	12.50	10.81	12.88
2009	11.02	12.49	11.20	13.96
2010	11.38	12.58	10.66	12.56
2011	12.79	11.38	9.65	13.17
2012	13.24	10.29	8.10	15.15
2013	12.36	8.69	7.82	16.39
2014	12.55	8.01	7.67	16.91
2015	12.00	7.80	8.10	18.90

Adapted from : The World Bank Group (2016)

Table 1.2 Percentage of export by top partners (%)

Year	Singapore	Japan	United States	China
2006	15.41	8.87	18.79	7.24
2007	14.54	9.21	15.65	8.78
2008	14.63	10.66	12.49	9.57
2009	13.95	9.84	10.96	12.15
2010	13.36	10.37	9.55	12.60
2011	12.69	11.51	8.30	13.14
2012	13.60	11.87	8.67	12.64
2013	13.92	11.00	8.08	13.48
2014	14.21	10.80	8.42	12.05
2015	13.90	9.50	9.40	13.00

Adapted from : The World Bank Group (2016)

According to Shin and Yang (2012), there is direct causal relationship between trade in goods and financial transactions, while the directional impacts are much stronger from the former to the latter. The international trading relationships suggest that there is an economic integration between Malaysia and its main trading partners. Economic integration is marked by trade barriers reduction or elimination and monetary and fiscal policies coordination with aims of lowering costs and increasing trade between the countries involved in the agreement. The presence of economic integration provides a channel for financial integration. Financial integration is marked by closely linked of financial markets such as sharing of information, best practices or cutting edge technologies, cross-border capital flows and foreign participation in the domestic financial markets. Hence, Malaysia stock market is predicted to have an integration relationship with its major trading partners' stock market.

There are several events happened in the world tremendously affected the global stock markets. In 2015, China's stock market crash and the country's economic decline have enormously affected the global market. Over the weeks of August 2015, Shanghai Composite index had declined 8.5% and the slump in Chinese shares has also prompted a slump on stock markets across Asia, Europe and the U.S. In Malaysia, there is losses in both stock market and the ringgit, which fell 0.28% and 0.05% respectively. For FTSE 100 and on Wall Street, about £74bn was wiped off the value. Apart from that, the Dow Jones Industrial Average experienced a steep fall of more than 1,000 points.

Moreover, at the end of June 2016, a shock issue known as Brexit happened as the British has voted to leave European Union. German and United States are the major trading partner of UK. The leaves of Britain from the European Union had caused a tremendous effect on the global economy and threaten more than a trillion dollars in trade and investment with the United States. Germany's largest stock index (DAX) dropped as much as 1000 points while United States Dow Jones index dropped 611 points or 3.4% and close at 17400 on 24 June and drop to 17140 or 360 points on the subsequent trading day. Besides, the Asian stock market has also affected by the Brexit. For instance, FTSE Bursa Malaysia KLCI dropped as usual along with financial markets worldwide. It slipped 28.1 points and closed at 1634.06 which have a negative 0.36% of changes. Moreover, Japan stock market exchange Nikkei 225 also dropped 7.92%, Hang Seng Index fell 2.92% while Singapore’s Straits Times decrease 1.30% on the next day of Brexit.

Other than that, the outcome of Donald Trump's success in United States presidential elections during 2016 had enormous effect on the global markets. The global financial markets tumbled immediately following the election results, but rebound after that. For example, Dow Jones industrial average dropped 0.30%, but then

climbed 0.40%. Furthermore, most of the stock indexes across Asia closed the day in the red. For instance, FTSE Malaysia KLCI dropped 0.97%, Singapore's Straits Times Index decreased 0.90%, Hong Kong's Hang Seng Index decreased 2.20%, Japan's Nikkei Stock Average dropped 5.40% and China's Shanghai Composite Index fell 0.60%.

Given the issues presented, is it deduces that there is a strong nexus between domestic stock market and major trading partners' stock market? Hence, this paper aims to study the integration of stock market between Malaysia and its main trading partners which are the United States, Japan, China and Singapore.

Malaysia's Stock Market Development

Historically, the first official organization of securities business in Malaysia, which is Singapore Stockbrokers' Association, was established in 1930 and was re-registered as the Malayan Stockbrokers' Association in 1937. The Malaysian Stock Exchange was then set up and started to trade the shares in public since 1960. The trading rooms were set up in Singapore and Kuala Lumpur and linked with direct telephone lines.

In 1966, Singapore disaffiliated itself from Malaysia and became an independent country. Thus, the Stock Exchange in both countries were separated into Kuala Lumpur Stock Exchange Berhad (KLSEB) and Stock Exchange of Singapore (SES) due to the termination of currency exchangeability between Malaysia and Singapore in 1973. In 1976, operations of Kuala Lumpur Stock Exchange Berhad (KLSEB) were taken over by Kuala Lumpur Stock Exchange (KLSE), which was incorporated on December 14, 1976. In 1994, it was then assigned a new name, which is Kuala Lumpur Stock Exchange (KLSE).

The Industrial Index was launched in January of 1970. It was the first indicator for the stock market of Malaysia. It consists of 30 stocks of industrial with the year 1970 as the base year. The Industrial Index has no more ability to reflect Malaysian stock market since 1985 onwards. Hence, a better barometer of index - KLCI was introduced in 4 April 1986. It comprised of 83 companies. The calculation frequency was 3 times per day, while the trading volume criteria are 250 lots per annum. The KLCI index calculation was enhanced to every 15 minutes on 30 January, 1990. Then the trading volume criterion was further improved to 1,000 lots annually on 29 May 1992. The frequency of calculation increased to every 60 seconds on 18 April 1995.

On 14 April 2004, Kuala Lumpur Stock Exchange (KLSE) was then turned into a demutualized exchange and assigned with a new name as Bursa Malaysia Berhad. Bursa Malaysia was listed on the Bursa Malaysia Securities Berhad's Main Board on 18 March 2005.

After that, the KLCI was renamed as Financial Times Stock Exchange (FTSE) Bursa Malaysia KLCI on 6 July 2009. Bursa Malaysia introduced an improvement on their index by adopting the FTSE's global index standards. It was then renamed as FTSE Bursa Malaysia KLCI after that. It practiced the globally accepted index calculation methodology in order to provide an index with higher stability, tradability and transparency. Besides, the FTSE Bursa Malaysia EMAS Index and FTSE Bursa Malaysia Top 100 Index were also accessible to those people who were using KLCI at that time and would like to go for a wider coverage of companies.

The index calculation is based on the amount of constituents has been replaced to thirty biggest companies by full market capitalization on the Main Market of Bursa Malaysia (Refer to Table 2.1). The improvement will be easier to be managed and more entreating for the establishment of Index Linked products to ensure that the market is liquid enough. There are two main eligibility requirements that have to be fulfilled so that it could be chosen as the constituent of FTSE Bursa Malaysia KLCI. First, a minimum free float of 15% is required for each company; second, a screen of liquidity is needed to guarantee that the shares of company are liquid enough to be traded.

Table 2.1 : 30 Largest companies in Bursa Malaysia

Company	**Stock Code**	**Company**	**Stock Code**
AMMB Holdings	1015	Malayan Banking	1155
Astro Malaysia Holdings	6399	Maxis	6012
Axiata Group	6888	MISC	3816
British American Tobacco (Malaysia)	4162	PETRONAS Chemicals Group	5183
CIMB Group Holdings	1023	Petronas Dagangan	5681
Digi.com	6947	Petronas Gas	6033
Felda Global Ventures Holdings	5222	PPB Group	4065
Genting	3182	Public Bank	1295
Genting Malaysia	4715	RHB Capital	1066
Hong Leong Bank	5819	SapuraKencana Petroleum	5218
Hong Leong Financial	1082	Sime Darby	4197
IHH Healthcare	5225	Telekom Malaysia	4863
IOI	1961	Tenaga Nasional	5347
IOI Properties Group	5249	UMW Holdings	4588
Kuala Lumpur Kepong	2445	YTL Corporation	4677

Adapted from : Wikipedia (2017)

To ensure that the KLCI is continuing without any interruption, the KLCI historical index values were maintain for the new FTSE Bursa Malaysia KLCI until 3 July 2009. Then, the KLCI closing value on 3 July 2009 was used as the opening value of the FTSE Bursa Malaysia KLCI on 6 July 2009. Now, the FTSE Bursa Malaysia KLCI was calculated using the real time and closing prices retrieved from Bursa Malaysia, which are based on a value weighted formula and modified by a free float factor. The Index calculation frequency was also declined from every 60 seconds to 15 seconds in order to ensure a close and efficient tracking on the market pulse.

China's Stock Market Development

Treaty of Nanking in 1842 and agreements between China and foreign governments caused the formation of the International Settlement in Shanghai. It was important to the development of foreign trade in China and foreign community in Shanghai. The securities trading market in Shanghai began in the late 1860s. The first shares registrar was in June 1866. After that, Shanghai's International Settlement had developed several banks, legal framework and trading houses.

During the extreme growth in mining shares in 1891, foreign businessmen created Shanghai Sharebrokers' Association in Shanghai and it is the China's first stock exchange. In 1904, registration in Hong Kong was applied and renamed as Shanghai Stock Exchange. The securities supplies are primarily from the local companies.

Shanghai Securities & Commodities Exchange and Shanghai Chinese Merchant Exchange began operation in 1920 and 1921. They then merged in 1929. Plantations of rubber became the main stock trading in the 1920s. By 1930s, Shanghai had become the financial centre of Far East, whereby investors can trade shares, debentures, government bonds, etc.

After Shanghai International Settlement was occupied by the Japanese troops on 8 December 1941, Shanghai Stock Exchange operation was halt. In 1946, Shanghai Stock Exchange resumed its operations but the operations were stopped again after 3 years in 1949 when the Communist revolution arise.

When Deng Xiaoping became the dominant figure in China in 1978, China was reopened to foreign countries. During the 1980s, trading of treasury bonds resumed. On 26 November 1990, Shanghai Stock Exchange was reconstruct and it began operations on 19 December 1990.

In the year 2008, there are 861 companies listed on the Shanghai Stock Exchange and the total market capitalization hit RMB 23,340.9 billion.

United States' Stock Market Development

The first stock market for United States which is New York Stock Exchange was established on 17 May 1792, where twenty-four stockbrokers and merchants signed the Buttonwood Agreement on Wall Street in New York City. All of them agreed to set a commission rate and trade securities in return for commission. In 1817, a formal organization named as New York Stock & Exchange Board was created and several rooms were rented at 40 Wall Street Journal for securities trading purpose. Since then, New York Stock & exchange change its name to New York Stock Exchange later in 1863. Due to overwhelming response from investors, New York Stock Exchange was then overtook Philadelphia as the main financial center for the United States.

As time goes on, the invention of telegraph and telephone created a new era in trading. As a result, the amount of trading activity increased significantly as traders are able to buy and sell through the devices. Besides, it gives investors a direct access to brokers and hence, it is more convenient to trade. In 1914, World War 1 forced the securities

exchanges around to world for being suspend. New York Stock Exchange closed for more than four months and it was the longest closing down in the history. In 1929, the stock market crashed and the share prices dropped around 89% which is then known as “Black Thursday” and considered as the initial stage of the Great Depression. On 19 October 1987, Dow Jones Index fell 22.61% or 508 points, which was the largest one-day drop since 1929.

Now, New York Stock Exchange is the largest and oldest stock exchange in the United States with a capital more than US$16 trillion, has an average daily trading value of US$169 billion. There are more than 1900 companies that listed in New York Stock Exchange and is regulated under Securities and Exchange Commission. Variety of products such as options, bonds and equities are provided by the exchange. Besides, New York Stock Exchange holds plenty of indices such as Dow Jones Industrial Average (DJIA), S&P 500, NYSE US 100 index and so on.

Japan’s Stock Market Development

The Tokyo Stock Exchange was first set up on 15 May 1878, leading by finance minister Okuma Shigenobu and capitalist advocate Shibusawa Eiichi of Japan. The first trading on exchange began within the same year in June. In 1943, the stock exchange was merging with 10 other stock exchanges in Japan and formed a single Japan Securities Exchange. However, Japan Securities Exchange was forced to dismiss on August 9, 1945 due to WWII and bombing by United States towards Nagasaki.

After the WWII, Tokyo Stock Exchange was finally reopened on 16 May 1949, and named as Tokyo Shoken Torihikijo. The citizens of Japan had to wait almost 17 years for government bonds and 24 years until the foreign stock and bond to be traded. After several post-war reformations, Tokyo Stock Exchange finally became one of the largest five exchanges in Japan. In 1969, Tokyo Stock Price Index (TOPIX) was introduced by Tokyo Stock Exchange. It consists of all the large companies in Japan and hence it is important for Tokyo Stock Exchange to determine how well the market is doing. Moreover, Floor Order Routing and Execution System (FORES) was introduced in 1990. It is a computerized processing system for the orders.

On November 22, 2011, Tokyo Stock Exchange merged with Osaka Securities Exchange and become the biggest stock exchange group in Japan. With this, Tokyo Stock Exchange becomes the fourth largest exchange in the world. It comprises of 3533 listed companies with a capitalization of US$ 4.98 trillion. In 2016, around 3.5 billion shares that worth $23.9 million was traded daily. There are some important indexes under Tokyo Stock Exchange that included TOPIX, Nikkei 225and so on.

Singapore's Stock Market Development

On 15 May 1973, Singaporeans were informed through the media regarding the change of Malaysia's foreign exchange control laws and regulations. Currency interchangeability between Singapore and Malaysia had decided to stop. This affects the Malaysia and Singapore Stock Exchange because the stock exchange serves 2 countries. On 9 May 1973 onwards, declaration form for the shares registration of Malaysian companies by Singapore residents cannot be signed.

On 12 May 1973, a three-man pro-tem committee was organized to start formulate a plan for the Stock Exchange of Singapore creation as soon as possible. Ng Soo Peng, the chair person of Stock Exchange of Malaysia and Singapore, leaded the committee.

The Securities Industry Bill Second Reading was brought into action on 23 May 1973. On 24 May 1973, the Stock Exchange of Singapore Ltd was founded and incorporated. Securities Industry Act 1973 is established to govern the stock exchange. On 16 June 1973, Stock Exchange of Singapore Ltd officially opened.

On 1 December 1999, Stock Exchange of Singapore (SES), Singapore International Monetary Exchange (Simex) and Securities Clearing and Computer Services Pte Ltd (SCCS) were merged. As a result, Singapore Exchange Limited (SGX) is formed. In 1999, there were total of 370 organizations listed on the share market with total market capitalization of SGD$434 billion which is 3.4 times the GDP for that 1999.

On 23 November 2000, SGX is the second exchange in Asia Pacific to be listed through a private placement and a public offer. SGX stock is one of the benchmark indices in the MSCI Singapore Free Index and the Straits Times Index.

On 31 January 2010, 774 organizations had been listed on SGX with a total market capitalization of SGD$650 billion.

1.2 Problem Statement

There are various ways for investors to conduct analysis when making decisions for investments and one of the methods is forecast the stock market trend. Whenever reasonable predictions with less bias on the stock market performance are generated, great profit will be made. Investors around the globe are constantly seeking for potential investment opportunities to diversify their portfolio for the purpose of risk sharing and profits maximization. In this era of globalization, due to the risen trend in international trade, the barriers for capital transactions among various countries had been reduced. In order to earn great returns from investments, investors not only invest in single market but also invest in several markets at the same time. However, under the influence of globalization, financial markets in today's world are getting better capital flows and promotion of cross-border information exchange, financial reforms, and advanced technology. These elements have increased the ability to respond immediately to news and shocks coming from the rest of the world, indicating that external factors does affect the performance of stock market and the linkages among stock markets of different countries have grown stronger. Therefore, the relationship of securities around the world has created and increased the interest among academia, investors, and managers of international fund to carry out the investigation.

In addition, although numerous researches have been carried out to study on the issue pertaining to linkage among the global stock markets, there are still insignificant numbers of researches paying attention on the integration among the stock market of Malaysia and its primary partners of trading.

Due to the facts laid out above, it is important to study the profound effects of Malaysia's major trading partner stock market on its stock market.

1.3 Research Objectives

The objectives of the study are as below:

- The general objective of this research is to study stock market integration between Malaysia and its major trading partners.

- The specific objective of this research is to investigate the integration between the stock market of Malaysia and the stock markets of its major trading partners, namely China, the United States, Singapore, and Japan from year 2005 to year 2016.

1.4 Research Questions

The study has formed a research question, as follows:

- Do the stock market returns of Malaysia's major trading partners, namely China, United States, Singapore, and Japan affect the stock market return of Malaysia from year 2005 to year 2016?

1.5 Significance of Study

This study focuses on integration between the stock market of Malaysia and the stock markets of its major trading partners, by identifying its existence, investors can have a better insight on the integration relationship of stock markets. Thus, from the view of investors, the findings of study can serve as a useful guideline for individual and institutional investors to enhance their works on stock market predictability or forecasting and make more accurate analysis in Malaysian stock market. Consequently, chances for investors to earn great returns from investments will be increased whenever reasonable predictions with less bias on the stock market performance are generated.

The linkages of global securities markets have received much concern from academia, investors and fund managers since degree of stock market integration serves as an important elements in portfolio management. Therefore, from the view of researchers, it is believed that this study carries specific significance for the further investigation in stock market integration.

1.6 Chapter Layout

Basically, this study comprises of five sections: Chapter 1 presents the introduction of study including the research background, problem statement, objectives of research, questions of research, and significance of the study. The literature review, which reviews some previous academic works on stock market integration, is presented in Chapter 2. Chapter 3 presents the proposed methodology of the study including data description, research framework, and econometric methods. Chapter 4 mainly focuses on the data analysis which includes the interpretation of result and discussion of major findings. Lastly, Chapter 5 presents conclusion with some implications of this study, limitations of study and recommendations for the future research.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

Previous studies regarding the integration relationship of stock markets are reviewed in this chapter, which would show how thorough the previous researchers had done their research on the stock market, especially the integration between the stock markets of Malaysia and its major trading partners and whether the stock market return of Malaysia is affected by its major trading partners.

2.1 Stock market integration

According to Karim and Karim (2008), they stated that there is a positive relationship of stock market integration among Malaysia, the United States, Japan, Singapore and China by using Johansen (1988) and Johansen and Juselius (1990) cointegration test and VECM approach. In long-run, Malaysia stock market will be influenced by United States, Japan, Singapore and China while only Singapore and Japan will bring impact towards Malaysia in both short and long run. The result is consistent with Karim and Majid (2010). They examined again the stock market integration and short-run dynamic integration by using other approaches namely autoregressive distributed lag (ARDL), vector autoregression (VAR) framework and bound testing approach. The outcome is comformable to previous studied which shown that there is

a positive relationship among them. Besides, stock markets are moving toward more integration after the 1997 financial crisis.

However, Wan Azmi (2004) found no relationship among the stock markets in the pre-control time by using Johansen maximum likelihood cointegration test. The results also indicate that the stock prices of these countries namely Malaysia, United States, Japan and Singapore were affected mainly by country-specific factors rather than normal international factors. Besides, it also indicates that short-term relationship does exist between these markets.

For ASEAN countries' market, Royfaizal, Lee, and Azali (2009) concluded there is a relationship between ASEAN 5+3 countries' stock markets namely Malaysia, Thailand, Indonesia, Philippines, Singapore, China, Korea, and Japan stock market before and during crisis. The approaches using by them included cointegration and Granger-causality technique. The results are is consistent with Royfaizal, Lee, and Mohamed (2007) and Arshanapalli, Doukas, and Lang (1995), which concluded that there are long-run relationships between United States stock market and ASEAN-5+3 stock markets arise only during crisis period and post-crisis period. For the pre-crisis period, there is no significant cointegration among the ASEAN-5+3 stock markets.

In addition, Janor and Ali (2007) concluded there are linkage of stock market among ASEAN countries which are Malaysia, Indonesia, Philippines, Thailand and Singapore by using bivariate and multivariate cointegration technique. The results is conformable to Phuan, Lim, and Ooi (2009) which investigated the stock market integration among ASEAN-5 stock market by using Granger-casuality tests, Johansen and Juselius multivariate cointegration procedures and variances decomposition analysis. The outcomes show that Singapore brought the most effect to Malaysia,

Thailand and Philippines stock market after financial liberalization. In short, ASEAN-5 stock markets have positive relationship and become more integrated after the financial liberalization. Moreover, Wong, Goh and Kok (2003) examined that relationship among five ASEAN countries' stock market, namely Malaysia, Singapore, Indonesia, Thailand and Philippines. During pre-crisis period, most of the stock market had positive relationship. However, they have negative or zero relationship during the period of crisis. Besides, Singapore brings the most influence to other markets in pre-crisis period but began to weaken after the crisis. In short run, the linkages between Malaysia and other ASEAN stock market began to weaken after the financial crisis.

Chien, Lee, Hu, and Hu (2015) have looked into the relationship between the stock markets of China and ASEAN. They found that both China's and Malaysia's indexes were positively related before the 1997 financial crisis. However, the indexes become negatively related after that and there are two reasons behind this. First, China got its industry structure enhanced due to the financial crisis. Second, the financial crisis has caused Malaysia lose in its competitive advantage. The results is consistent with Jakpar, Vejayon, Johari, and Myint (2013), which stated that there is long run relationship in stock market volatility between China and ASEAN-5 countries by using ADF unit root test, JJ cointegration test, and Granger causality test. The outcome shows the existence of bidirectional causality relations between China and Indonesia, China and Thailand, and China and Singapore. However, there is no causality relation between China and Malaysia; and also China and Philippines. As a result, it can be posited that there are relationship between regions in the stock market volatility.

Next, Johnsen and Soenen (2002) have investigated the level of integration between the stock market of Japan and the stock markets of another twelve countries in Asia.

What they have found from their research is that the stock markets of Malaysia, Singapore, Hong Kong, China, Australia, and New Zealand are highly integrated with Japan's stock market. Moreover, they have also proved that the integration between country pairs among these thirteen Asian stock markets become higher and higher over time, from 1994 onwards. The factors behind the rise of the stock market integration level between Japan and these countries are higher export shares by these Asian countries to Japan and higher foreign direct investment from Japan to these countries; vice versa. Ibrahim (2006) evaluate the stock market's linkage between the United States and Japan and five ASEAN countries namely Malaysia, Indonesia, Philippines, Singapore and Thailand by using simple regression and VAR analysis. The results indicated that United States stock market bring more effect towards ASEAN stock market compared to Japanese stock market.

Furthermore, there is also a study regarding the co-integration between the stock markets of major developed countries, such as United States, United Kingdom, and Japan, and emerging stock markets of several Asian countries, such as Malaysia, Singapore, Thailand, Korea, Taiwan, Hong Kong, Indonesia and Philippines. Wong, Penm, Terrell, and Karen (2004) have found that there is no stable long-run relationship between Malaysia and these major developed stock markets. Yet, this kind of relationship may vary from time to time, with the evidence from the results which show that there will be different co-movement between them in each period of time. The result is consistent with Arshanapalli et al. (1995) which examined the integration of stock markets between United States and six Asian stock markets including Malaysia, Japan, Hong Kong, Philippines, Singapore and Thailand via multivariate error-correction analysis and multivariate cointegration tests. The results denoted that there is a long run relationship between them during post financial crisis. They also concluded that equity markets in Asian were less integrated with Japan stock market than United States market.

Samsi and Yusof (2011) have investigated the stock market integration among United States, Japan, Hong Kong, Taiwan, Malaysia, Singapore, Thailand, Philippines, India and Indonesia via Granger causality test, Johansen cointegration analysis and vector error correction model. The outcome indicates that Malaysia stock market have positive relationship with other Asian region especially Hong Kong, Singapore, Thailand, Philippines and Indonesia during 1997 financial crisis. This is consistent with Yang, Kolari, and Min (2002). They studied the short and long run relationship among United States, Japan, Malaysia and other Asian emerging stock markets including Indonesia, Korea, Philippines, Thailand, Hong Kong, Singapore and Taiwan. Error correction model (ECM) and generalized impulse response function were employed by the researchers. The outcome provided that the relationships among them began to rise during the crisis and became more integrated before and after crisis occurred. They also mentioned that United States has influenced towards Asian market but Japan has a little or no influence on the Asian market during financial crisis.

Choudhry, Lu, and Peng (2007) have studied the influence of Japan and US stock market towards eight Far East countries (Malaysia, Singapore, Thailand, Indonesia, Hong Kong, Philippines, South Korea and Taiwan) by using casuality tests, Johansen multivariate cointegration method and band spectrum regression. The outcomes devoted that both United States and Japan have positive relationship with eight Far East countries during and after financial crisis. In addition, Moon (2001) suggests that the integration of Asian markets with United States rose dramatically right after the currency crisis in both short run and long run. The results is consistent with Cheung and Mak (1992) which examine the relationship among developed country namely United States and Japan and Eight Asian-Pacific countries including Thailand, Singapore, Indonesia, Malaysia, Philippines, Hong Kong, Korea and Taiwan. The result shows that the United States stock market will affect most of the Asia-Pacific

countries except for Korea, Taiwan and Thailand. However, Japan seems to have lesser impact on Asia-Pacific countries' market compared to United States.

A study which looked into the linkages between Malaysia stock markets and the Tiger Markets was being carried out by Marimuthu and Ng (2010). The stock markets under the Tiger Markets are Singapore, Taiwan, Hong Kong and South Korea. The results show that there is a long-run relationship among these five stock markets, but less likely to have any relationship in short-run. The Malaysia stock market is affected by the stock markets of Taiwan, South Korea, and Hong Kong, while it merely influences the stock market of Singapore.

2.2 Does stock market return affect by major trading partners?

According to Karim and Majid (2010), there is positive relationship between stock market of Malaysia and stock market of its major trading partner (United States, Japan, Singapore, Thailand and China) by using two-step estimation, Generalized Method of Moments (GMM) and Autoregressive distributed lag (ARDL). Malaysia stock market was influenced by them in both short run and long run during pre-crisis period. However, their relationship started to weaken after the financial crisis. This outcome is consistent with outcome of Karim and Gee (2006). They stated that there is a positive relationship among them by using bivariate cointegration and causality technique. Before 1997 financial crisis, long-run relationship does exist between stock market in Malaysia, Philippines and the United States. However, there is no

cointegration relationship among them during the financial crisis. Their relationship started to weaken after financial crisis.

According to Karim, Majid, and Karim (2009), long-term equilibrium relationship exists amongst the stock markets of Indonesia and its primary partners of trading which included United States, China, Japan, and Singapore, by using Autoregressive Distributed Lag (ARDL) and Vector Autoregressive (VAR) frameworks. In the short term period, the market of Indonesia reacts more quickly to the dynamics in the U.S. than in the market of Japan. The outcomes are same with Yang, Kolari, and Min (2003) and Ibrahim (2006) who find out that the Asian markets of Asian react faster to the dynamics in the United States but have been less affected by Japan's market.

Lim and Shaista (2008) have studied the presence of linkages or co-movements between Malaysia stock market and stock markets of its three major trading partners, which are United States, Japan, and Singapore, after the 1998 Asian Financial Crisis. After carrying out the correlation analysis, co-integration, and Granger Causality tests, the results proved that, in whole, these four stock markets are most likely to have linkages or co-movements among them even though the correction between these four countries is weak, with the bi-directional causality appears between the stock markets of Malaysia and Japan. In particular, this bi-directional causality relationship indicates that the stock market of Malaysia is affected by the stock markets of the other three countries included in this study, but only brings impacts to the Japan stock market. The results also show that the stock market of Japan is affected by and also influencing all other countries included in this study. For the stock markets of Singapore and the United States, they are affected by all other countries included in this study, except for Malaysia, and influencing all other countries included in this study. The reason for the existence of the linkages is that these four stock markets

have gone through significant liberalization, which means that the restrictions or policies in the politic or economic system might be removed or loosen.

Lai (2011) has studied the integration of stock market and short-term dynamic relationships between Philippines and its primarily partners of trading which are Singapore, China, Japan and United States by using Johansen and Juselius (JJ) which is test of co-integration, Vector Error Correction Model (VECM) which is test of granger causality and generalized impulse response function (IRFs). This study has showed Philippines stock market is co-integrated with its primarily partners of trading in the long-term period. Besides, short-term dynamic linkages between Philippines stock market and Singapore stock market and United States stock market has been found. It conclude the high co-movement between stock markets is due to the strong bilateral trade and geographic proximity.

According to Paramati, Gupta, and Roca (2015), interdependence between Australia stock market and its partners of trading stock market is driven by intensity of trade. It states there is higher correlations between Australia and its major partners of trading but lower correlations between Australia and its minor partners of trading. In short, bilateral trade linkages increase cause the level of stock market interdependence increases as well. The results are consistent with Pretorius (2002); Chinn and Forbes (2004); Gibson and Chamber (2005); and Tavares (2009) who document that the countries stock market interdependence can be increased significantly if there exist bilateral trade linkages between countries. In conclusion, strong linkages of bilateral trade is important to ensure long-term relationship with the stock market of trading partners.

According to Khan and Oazi (n.d.), co-integration and long-run equilibrium relationship are exist between Pakistan capital market and its four partners of trading which are United State, United Kingdom, Korea and Japan by using Johansen Co integration technique. However, they found out that co-integration does not exist between Pakistan capital market and its other partners of trading which are China, Germany, India, Hong Kong, Malaysia and Singapore. It is due to the inefficient of Pakistan capital market and the banking sector of Pakistan is not co-integrated with its partners of trading. Hence, relationship of Pakistan and its other partners of trading cannot be last for long period.

According to Valadkhani and Chancharat (2007), there is absent of long-term relationship among the Thailand stock market and its primarily partners of trading namely Hong Kong, Korea, Indonesia, Australia, Japan, Philippines, United Kingdom, Malaysia, United State, Taiwan and Singapore by employing the Gregory and Hansen (1996) test and the Engle-Granger two-step procedure. There is consistency on result with Climent and Meneu (2003) who document that Thai stock market is not co-integrated with some regional stock markets which included Pacific Basin countries and South-East countries. However, during short-term movements of international stock market returns, there are three one way directional Granger causalities from Hong Kong stock market return, the Philippines stock market return and United Kingdom stock market to Thailand stock market. Besides, there are two one-way directional causality which are from Thailand stock market to United State stock market and Indonesia stock market. In addition, there is two-way directional Granger causality among the stock market returns of Thailand and the stock markets of its three neighborhood countries which including Taiwan, Malaysia and Singapore.

Deev and Kajurová (2004) state that there is an evidence that stationary long-term relationship is exist among stock market of Czech Republic and stock markets of its

main partners of trading which are Germany, Slovakia, China, Poland, France, Italy, Australia, Russia and United Kingdom (UK) by employing test of Johansen co-integration, tests of Granger causality and Vector Error Correction Model (VECM). They concluded that Czech Republic share market is affected by the movement and growth in the share markets of its major partners of trading. However, the markets are less co-integrated in the long run during and after the global financial crisis due to specific market conditions' change.

Kazi (2008) has carried out a study to investigate the co-integration relationship between Australia and its main partners of trading due to the effect of globalization by using Johansen co-integration technique to test whether share market of Australia is interdependent with stock markets of United Kingdom, United State, German, Canadian, Japanese and French. The researcher prove that there long-term relationship is exist between Australia stock and overseas equity markets. However, even though all the markets are integrated, yet not all selected markets are significant and equally influential. The theoretical basis under this study are the International Arbitrage Pricing Theory (IAPT),International Asset Pricing Model (IAPM), and market efficiency or efficient market hypothesis (EMH)where Capital Asset Pricing Theory (CAPM) is explain further by International Asset Pricing Model (IAPM) while Arbitrage Pricing Theory (APT) affect International Arbitrage Pricing Theory (IAPT).

CHAPTER 3: METHODOLOGY

3.0 Introduction

In this study, time series data will be employed to investigate the integration between Malaysia stock market and its major trading partner namely Singapore, Japan, China and United States. This study adopts Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model as it would be able to verify the hypotheses, examine the relationship between the variables to fit the objective of this study and capture the characteristic of financial time series data. Secondary data are used for this study and all the data are collected from Bloomberg.

This chapter can be divided into four sections. Section one is data description. Section two describes the econometric model. Section three describes the econometric method applied in this study. Lastly, section three provides a chapter summary.

3.1 Data Description

All of the countries stock market indexes are collected from Bloomberg database. The sample period is from 1st of January, 2005 to 31st of December, 2016 which are recorded in daily basis excluding Saturday and Sunday while the indexes for public holidays are the closing index of previous day. There was total of 15650 data in these five countries to be used in this study.

In order to calculate the percentage change of stock market, the current day market index minus previous day market index then divided by previous day market index. After that, the figure is multiply by one hundred percent. The formula to calculate the percentage change of stock market is as follow:

$$\frac{P_t - P_{t-1}}{P_{t-1}} \times 100\%$$

Where:

P = Stock market index

t = Time periods of the data from year 2005 to 2016

3.2 Research Framework

To examine the stock market integration between Malaysia and its major trading partners, the study adopts research framework proposed by Paramati, Gupta & Roca (2013) as below :

$$\Delta \text{KLCI}_t = \beta_0 + \beta_1 \Delta(\text{DOWJONES})_t + \beta_2 \Delta(\text{NIKKEI})_t + \beta_3 \Delta(\text{SSE})_t + \beta_4 \Delta(\text{STI})_t + \mathcal{E}_t$$

Where: Δ KLCI = Malaysia stock market return

Δ DOWJONES = United States stock market return

Δ NIKKEI = Japan stock market return

Δ SSE = China stock market return

Δ STI = Singapore stock market return

$\mathcal{E}$ = Error term

t = 1, 2, 3,…, 3130

Ordinary least squares (OLS) equation is formed to obtain its residuals for examination of diagnostic. Normality test will be conducted for the estimated residuals ($\mathcal{E}_t$) of the above equation in order to examine its normality. The non normality of residuals implied that OLS equation is not appropriate.

3.3 Econometric Method

3.3.1 Autoregressive Conditional Heteroscedasticity (ARCH)

$$\Delta \text{KLCI}_t = \beta_0 + \beta_1 \Delta(\text{DOWJONES})_t + \beta_2 \Delta(\text{NIKKEI})_t + \beta_3 \Delta(\text{SSE})_t + \beta_4 \Delta(\text{STI})_t + \mathcal{E}_t$$

$$\varepsilon_t \sim N(0, \alpha_0 + \varepsilon_1 u_{t-1}^2)$$

This shows that error term is normally distributed with zero mean and conditional variance depending on the squared error term lagged one time period. The conditional variance is the variance given the values of the error term lagged once, twice etc:

$$\sigma_t^2 = \text{var}(u_t \setminus u_{t-1}, u_{t-2}....) = E(u_t^2 \setminus u_{t-1}, u_{t-2})$$

Where σ_t^2 is the conditional variance of the error term. The ARCH effect is then modelled by:

$$\sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2$$

This is an ARCH(1) model as it includes only a single lag on the squared error term. However, it is possible to be extended to any number of lags, if there are q lags, it is termed as ARCH(q) model. In our model, ARCH(1) will be used. Before estimating the ARCH model, it is reasonable to carry out a test for

"ARCH effects" to ensure that the models are suitable for the data. The presence of ARCH effect in our model signals that the classical linear regression model is not appropriate, while the absence of ARCH effect suggests that the GARCH-type models are not necessary.

3.3.2 Generalized Autoregressive Conditional Heteroscedasticity (GARCH)

Mukherjee and Mishra (2008) adopted the basic GARCH (1,1) model to conduct their researches. The regression models are as follow :

$$R^{k}_{i,\,t} = \gamma_0 + \gamma_1 R^{k}_{i,\,t-1} + \gamma_2 h_t^{1/2} + \varepsilon_t \qquad (1)$$

$$h_t = \alpha_0 + \alpha_1 \varepsilon^2_{t-1} + \beta_1 h_{t-1} \qquad (2)$$

The model (1) represents the equation of conditional mean while the model (2) represents equation of conditional variance.

GARCH model is a transformation of ARCH model. By looking at F-statistics and the Obs*R-squared (LM statistic), if there is presence of ARCH effect, GARCH model can be used.

The GARCH model is a model which joints the moving average into ARCH model. Which its final output of coefficient shows its volatilities whether cause by new information (α) or its own moving average (β) effect.

In this research, one past lag time varying variance is included as regressor. The coefficient of α represent the ARCH effect; it is the volatilities level owing to the new information. The coefficient of β represent the moving average effect, which indicates the volatilities that caused by its own lag moving average effect. In order for the GARCH model to be valid, both of the coefficient must be significant and have positive value, and sum of these values must below 1.

A large number of researchers had employed GARCH models in their studies to test the stock market integration. Koutmos (1996) examines the stock markets integration among four major European stock markets in terms of lead-lag relationship and volatility by using GARCH model. Choudhry (1996) stated that there are changes in the persistence volatility and risk premium before and after the October 1987 crisis by using GARCH model and data from year 1976 to 1994. Karim, Karim and Gee (2010) examine the volatility spillovers among the ASEAN-5 namely Philippines, Thailand, Singapore, Malaysia, and Indonesia stock market returns after the Asian financial crisis by employing EGARCH model. Paramati et al. (2015) employed GARCH models to study the stock market correlation between Australia and its trading major partners.

Hence, GARCH model is believed to be the best fitted model to employ in this study in examining the integration of stock market between Malaysia stock market and its trading partners.

3.4 Conclusion

In this chapter, the econometric model has developed and data collected from Bloomberg had been processed by using GARCH model to detect the significance of independent variables. The following chapter will proceed with the interpretation and discussion of the results.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

The highlight of chapter four is the analysis of the stock market return of Malaysia's major trading partners namely the United States, Japan, China and Singapore on Malaysia stock market return. Daily data from the 1st of January, 2005 until 31st of December, 2016 has been used. Jarque-Bera test is used to detect whether the model's error term is normally distributed while ARCH test is conducted to detect the heteroscedasticity problem. The existence of non normality error term and heteroscedasticity problem confirmed that Ordinary Least Squares (OLS) method is not efficient to capture the effect of financial data. Hence, GARCH model will be applied instead of OLS method because it is specifically design to capture the effect of heteroscedasticity. Diagnostic checking including WALD test, correlogram of standardized residuals and correlogram of standardized residuals squared are applied to ensure the GARCH model is correctly specified. Other than that, the impacts of each independent variable on the KLCI are shown.

4.1 Interpretation of Results

Table 4.1: The Summary of Test using OLS method

Independent Variable	OLS
CONSTANT	0.0166 (1.5160)
DOWJONES	-0.0220 (-2.1910) ***
NIKKEI	0.0680 (8.3230) ***
SSE	0.0278 (4.1190) ***
STI	0.3012 (25.5980) ***
F-Statistic	369.60 ***
Heteroscedasticity	47.11***
Normality	51808.65***
Skewness	-1.29
Kurtosis	22.76

Note:

The figures in bracket represents test statistic of the coefficient.

*, ** and *** representing rejection of null hypothesis at 10%, 5% and 1% significant level.

Jacque-Bera test is used to detect the normality of error term, and the null hypothesis is the error term is normally distributed. ARCH test is used to detect the heteroscedasticity problem, and the null hypothesis is homoscedasticity. The rejection of both null hypotheses indicates that the estimators do not present the property of unbiased, linear, and efficient. The term of unbiased means the average or expected value of estimators are equal to the true value, linear means it is a linear function of a random variable in the regression model while efficient means it has minimum variance. Besides, by referring to Table 4.1, the kurtosis is 22.76422 which are much greater than a standard of 3.

Furthermore, by referring to Figure 4.1, time series data do not have a constant mean, and most exhibit phases of relative tranquillity by periods of high volatility. The features of financial time series data are high-frequency of observation, volatility clustering, fat tails and excess kurtosis, leverage effect and spill-over effect. Hence, the OLS method is not efficient enough to explain a number of important feature common to financial data.

Figure 4.1: FTSE KLCI Index

Source: Trading Economics (2017)

Figure 4.1 shows the example of high frequency of observations. By referring to the figure, from 1984 to 1992, the differences of index between highest and lowest is approximately 400 points. From 2008 to 2016, the difference is around 1000 points. This shows that stock market are very high in volatility. Given that the volatility is used to represent the risk, so the Figure 4.1 from the period of 1977 to 2017 indicates the high risk of stock market.

Figure 4.2: FTSE KLCI Residuals

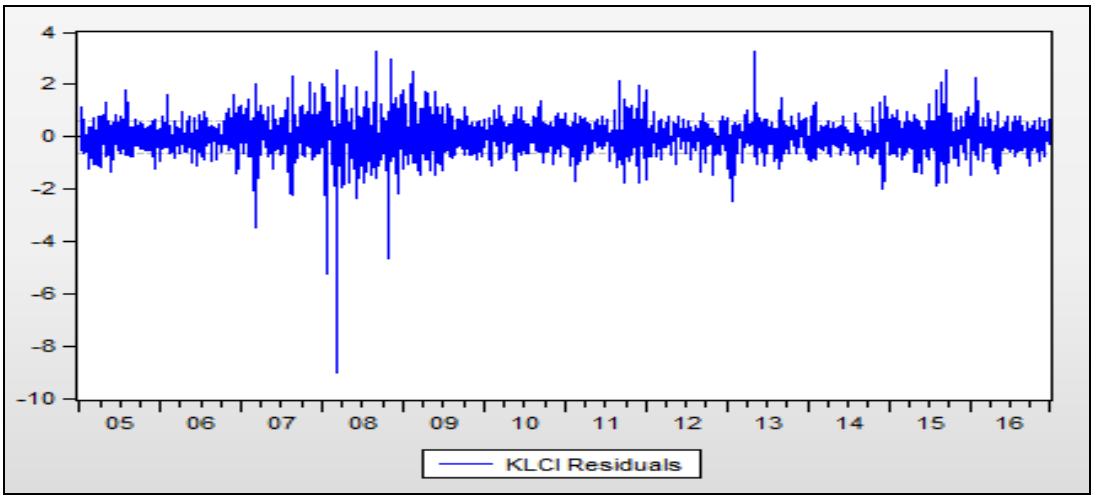


Figure 4.2 shows the example of volatility clustering. Volatility clustering is defined as large changes tend to be followed by large changes, of either sign, and small changes tend to be followed by small changes.

Due to the difficulties in modelling the typical feature of high frequency data, GARCH model will be applied instead of OLS method. Diagnostic checking has to be done in order to ensure GARCH model is correctly specified. To verify that the mean equation has been correctly specified, correlogram and the Q-statistic are used; to verify that the variance equation has been correctly specified, correlogram of squared residuals and Q-statistic are used.

Table 4.2: Diagnostic Checking

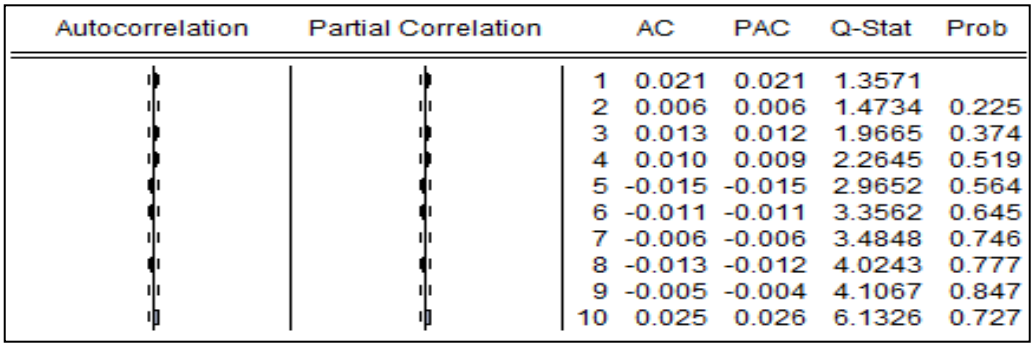
Independent Variable	GARCH
RESID(-1)^2	0.1824
GARCH(-1)	0.7735
T-statistic (probability)	0.0000 ***
F-statistic (probability)	0.0000 ***

Note:

The figures in bracket represents test statistic of the coefficient.

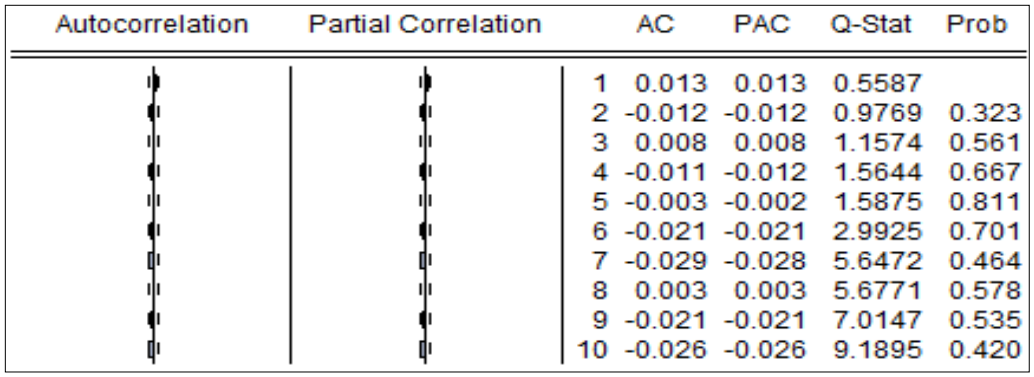
*, ** and *** representing rejection of null hypothesis at 10%, 5% and 1% significant level.

Figure 4.3: Correlogram of mean equation



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.021	0.021	1.3571	
		2	0.006	0.006	1.4734	0.225
		3	0.013	0.012	1.9665	0.374
		4	0.010	0.009	2.2645	0.519
		5	-0.015	-0.015	2.9652	0.564
		6	-0.011	-0.011	3.3562	0.645
		7	-0.006	-0.006	3.4848	0.746
		8	-0.013	-0.012	4.0243	0.777
		9	-0.005	-0.004	4.1067	0.847
		10	0.025	0.026	6.1326	0.727

Figure 4.4: Correlogram of variance equation



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.013	0.013	0.5587	
		2	-0.012	-0.012	0.9769	0.323
		3	0.008	0.008	1.1574	0.561
		4	-0.011	-0.012	1.5644	0.667
		5	-0.003	-0.002	1.5875	0.811
		6	-0.021	-0.021	2.9925	0.701
		7	-0.029	-0.028	5.6472	0.464
		8	0.003	0.003	5.6771	0.578
		9	-0.021	-0.021	7.0147	0.535
		10	-0.026	-0.026	9.1895	0.420

By referring to Table 4.2, the sum of the ARCH and GARCH term is 0.95589 and it is smaller than 1. Besides, WALD test reject the null hypothesis at 5% significant level representing the sum of ARCH and GARCH term is not equal to 1. The p-value associated with Q statistic in both mean equation and variance equations are not significant at 5% significant level, hence the mean and variance equation are correctly specified. The summary of test by using GARCH model is as follow:

Table 4.3: Summary of Test using GARCH model

Independent Variable	**GARCH**
Mean Equation	
CONSTANT	0.0271 (2.8162) ***
DOWJONES	-0.0169 (-2.5217) ***
NIKKEI	0.0575 (9.7633) ***
SSE	0.0258 (4.7883) ***
STI	0.2466 (31.1457) ***
AR(1)	0.1504 (7.9073) ***
Variance Equation	
CONSTANT	0.0191 (9.2113) ***
RESID(-1)^2	0.1824 (18.5702) ***
GARCH(-1)	0.7735 (57.3143) ***

Note:

The figures in bracket represents z-statistic of the coefficient.

*, ** and *** representing rejection of null hypothesis at 10%, 5% and 1% significant level.

The GARCH model results showed that United States' stock market, Japan's stock market, China's stock market, Singapore's stock market and AR(1) are statistically significant to explain Malaysia's stock market at 5% significance level.

By referring to Table 4.3, there is negative relationship between Dow Jones Index and KLCI Index while there is positive relationship between KLCI Index and Nikkei Index, SSE Composite Index, and STI Index. These relationship can be evidenced from some event happened.

On 14 December 2016, the central bank of United States decided to increase interest rates for the second time from 0.50% to 0.75%. This had caused the Dow Jones Index increased from 19,792.53 to 19,852.24 which it inched up by 0.30% or 59.71 points on 15 December 2016. Meanwhile, for Malaysia stock market, KLCI Index fell 6.3 points from 1,643.29 to 1636.99. Besides, the introduction of the immigration curb by the new president of United States on 27 January 2016 had brought some effects towards the stock markets. Most of the stock markets around the world fell after the introduction of ban on refugees and immigrants from Muslim countries (Cox, n.d.). On 30 January 2016, Dow Jones Index dropped from 20,093.78 to 19,971.13 and closed at 19,864.09 on next day. However, KLCI Index rose from 1,671.54 to 1,685.01 which saw it increased by 0.81% or 13.47 points. In short, this evidence shows that DJIA Index will negatively impact KLCI Index.

Natural disaster also one of the elements affect the economy of a country. In Japan, the economy hits by the earthquake for more than 100 years. The economy and stock market return (KLCI) of Malaysia are affected as well because Japan is one of the significant trading partners of Malaysia and had made huge investment in Malaysia. When a disaster happens, it will generally cause Japan’s economic downturn and Malaysia’s economy will feel the impact too. However, the impact on Malaysia economy is generally limited due to Japan’s major ports and industrial areas have been separated into different parts. For example, Tōhoku earthquake and tsunami which happened in March of 2011 has frightened Tokyo’s financial markets and caused Japan's Nikkei to drop for an average 43.39% from March to April.

Meanwhile, the KLCI dropped for an average 16.09% from March to April as well. It is consistent with the result that there is positive relationship between Malaysia and Japan where KLCI will drop when Nikkei drop.

Next, the positive relationship between SSE Composite Index and KLCI Index can be illustrated from the movement of stock market index between Malaysia and China. Stock markets in Malaysia have been affected when the stock markets in China experienced substantial volatility. For instance, as a result of the weak manufacturing data released and worries from the rest of the world about China's economy, Shanghai Composite index fell by 8.49% on 24 August 2015. The crash in China's stock market had caused Kuala Lumpur Composite index fell by 2.70%. Other than that, there was a steep sell-off on China stock market and trading was halted on 4 January 2016. The Shanghai Composite index fell by 6.86% while Kuala Lumpur Composite index fell by 2.31%. In conclusion, there are same direction movement for exchange rates and stock markets between Malaysia and China (Arslanalp, Liao, Piao & Seneviratne, 2016).

In the early morning of 23 March 2015, the former Prime Minister of Singapore Mr. Lee Kuan Yew passed away. During the day, the stock market of Singapore decreased 2.31 points or 0.07%. According to Selena Ling, the OCBC Bank economist, the decrease in stock market index was due to instant unthinking emotional response produced by the event. The influence of Mr. Lee Kuan Yew on the real economy is limited because he quitted as a policy maker for many years. Besides, Kevin Scully, the NRA Capital executive chairman also stated that Mr. Lee Kuan Yew has not been actively managing Singapore for years. Hence, the impact is at minimum. However, the slight decrease in Singapore stock market (STI) had cause the Malaysia stock market (KLCI) to decrease 7.8 points or 0.43%. This shows the positive relationship between Singapore stock market and Malaysia stock market.

Autoregressive is a stochastic process used in statistical calculations in which future values are estimated based on weighted sum of past values. An autoregressive process operates under the premise that past values have an effect on current values. Hence, autoregressive processes are used by investors in technical analysis in an effort to create forecasts of future price movement. AR(1) of KLCI is simply a first order process, meaning that today KLCI Index return will be affected by the yesterday KLCI Index.

4.2 Discussion of Major Findings

4.2.1 United States' stock market (Dow Jones Industrial Average Index)

The results of this study showed that DJIA Index appeared to be significant and negative related to the KLCI Index. The result is in contrast with Becker, Finnerty and Friedman (1995) study's result. According to Becker et al. (1995), United States' stock market is dominant in the global market and it is the most influential creator of information. Hence, it creates a leadership of price in the world market. International investors often over respond to news from United States market and focus less weight on message from other markets. Besides, Masih and Masih (1999) claimed that United States market led the market due to their greater liquidity, capitalization and cheaper transaction costs. They further explained it by using transaction costs theory

and distinct incentives for information search. If the costs of information search are fixed and constant across markets of dissimilar sizes, then the incentive to undertake research for mispricing will be more substantial for the bigger market than the smaller market. So, United States is the global stock market leader.

4.2.2 Japan's stock market (NIKKEI 225 Index)

NIKKEI 225 Index is significant and positively related to KLCI Index. The result is in consistent with Karim and Majid (2010) study's result. According to Karim and Majid (2010), interest in a yen bloc in Asia has been increasing due to the growing economic interdependence between Japan and its neighbors. In addition, the execution of financial reform program in Japan provided contributions to continuous arguments on the possibility among policymakers in those countries. With yen bloc, Japan would turn into the center of gravity of the economy of Asian Pacific. As the region becomes more and more integrated, larger business activity goes into the gravitational pull of Japan and its corporations. Trade and investment within the region would ongoing to grow faster than the rest of the world. As a result, Malaysia stock market is affected. Majid and Yusof (2006) claimed that the relationship between them is because of increase in equity investment by Malaysian in Japan.

4.2.3 China's stock market (SSE Composite Index)

SSE Composite Index showed significant and positively related to KLCI Index. The result is in consistent with Lean and Smyth (2014) study's result. They claimed that the Shanghai Stock Exchange is the six largest in the global market in 2013 based on domestic market capitalization and now Chinese markets are growing importance after the relaxation of its capital restriction on equity investments. Apart from that, China has emerged as a trading partner to the world. In 2006, the United States was the biggest trading partner for 127 countries, while China was the biggest trading partner for 70 countries. However, by 2011, China had become the biggest trading partner for 124 countries, while the United States was the biggest trading partner for 76 countries. Besides, Tong and Chang (2010) further explained that the economies of China and ASEAN are becoming interlinked. Between 1995 and 2008, bilateral trade between them grew up more than tenfold. The growth has been at high speed especially since 2001 when China joined World Trade Organization (WTO). Furthermore, ASEAN China Free Trade Area (ACFTA) entered into effect in 2010 and this generated the stock market integration between China and Malaysia.

4.2.4 Singapore's stock market (Straight Times Index)

This study results showed that STI Index appeared to be significant and positive related to the KLCI Index. The finding is consistent with Karim and Karim (2008), which stated Singapore, the major trading partner of Malaysia

significantly affect KLCI in the long run. They noted that the greater the ties of bilateral trade between two countries, the larger the degree of co-movements between them. In addition, Phuan et al. (2009) concluded that ASEAN countries' stock markets (Thailand, Indonesia, Philippines, Malaysia and Singapore) become more integrated after financial liberalization. According to Karim and Majid (2010), Singapore market is dominant to Malaysia market and this may because of the geographic proximity and nearer relationship between two stock markets. Geographically and economically close countries must display larger market integration level.

4.3 Conclusion

In this chapter, special characteristics of financial data were explained, diagnostic checking was performed and interpretation of the results was specified. Several tests were performed to check the GARCH model. In short, United States stock market is found to negatively affect Malaysia stock market while the remaining trading partners' stock market is found to positively affect Malaysia stock market.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATION

5.0 Summary

This paper examines the stock market integration between Malaysia and its major partners of trading, namely China, Singapore, United States and Japan from year 2005 to 2016 by using daily data. The integration of stock market is investigated by using Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model. The findings show that all the countries including Japan, China and Singapore are positively related to Malaysia stock market, while United States stock market has negative impact towards Malaysia stock market.

5.1 Implication of the study

This study provides the information on stock market integration between Malaysia and its major trading partner.

From the individual and institutional investors' point of view, this study provides some valuable guidelines to enhance their works on forecasting or predicting of stock market as the understanding of integration relationship among the stock market returns is significant for them to make appropriate and accurate decisions when doing portfolios diversification into other markets which aim for higher risk-adjusted returns. Based on the empirical result of this study, stock market in Japan, China and Singapore are positively related to Malaysia stock market while United States stock market are negatively related to Malaysia stock market. As a guide, investors can make prediction on trend of Malaysia stock market based on its trading partner stock market's trend. For example, a negative relationship implies that the stock market between two country will move in an opposite way while a positive relationship implies that the stock market between two country likely move in same direction.

From the researchers' point of view, this study carries specific significance and can be served as a foundation for future study especially for the study of stock market integration since numerous researches have been carried out to study on the issue pertaining to linkage among the global stock markets, but insignificant numbers of researches pay attention on Malaysia case. Moreover, the result can be a reference to narrow down the gaps between the arguments of researchers.

5.2 Limitations of the Study

The limitations on this study are acknowledged while the recommendation for future research is provided. Since this study is constructed based on the perspective of Malaysian stock market, the result provided might be only applicable for those who plan to invest in Malaysia. It might not be adopted by any other countries because there are differences in the characteristics of the stock markets or the countries itself and the movement patterns of the data. The movement pattern of the data is influenced by the development level of every country and the strength of the country in the field of a particular industry. It is also unable to show a strong evidence on the integration relationship between Malaysian stock market and the stock markets of other countries.

5.3 Recommendations of the Study

In order to increase the usefulness of the results from the research and also the number of the users of the results such as economists or researchers, future studies are recommended that not to merely focus on the perspective of Malaysian stock market, but should also take into account the perspectives of more countries or expand the scope of research to other countries.

Moreover, in order to get a more robust and sound result, future researchers are suggested to run the same data by using other statistic software, but not to fully rely on the results obtained from E-Views, which is the main software adopted in this study. This may help to double-check the accuracy and soundness of the results obtained and also may enhance the outcome of the model.

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