

# **INTI INTERNATIONAL UNIVERSITY**

## **MASTER OF BUSINESS ADMINISTRATION**

### **“Macroeconomic Factors that Influence Stock Market in Malaysia”**

**Author** : Tan Cher Huei  
**Student No** : I09003384  
**Supervisor** : Mr. Song Kuok Thong  
**Submission Date** : 15<sup>th</sup> December 2010  
**Ethics Number** : IN 1266  
**Final Word Count** : 19,476 words

**Faculty of Business and Accountancy**

## Abstract

The growth in the Malaysia stock market and the economy raises some questions with regards to the relationship between the stock price index and the key element of macroeconomic variables. This study investigates on the selected macroeconomic variables mainly the gross domestic product, exchange rate, consumer price index, interest rate, and money supply on the Malaysia stock market index. This study uses time-series data from the year 1977 to year 2008 with the intention to identify the long-run and short-run relationship between the selected variables. It applies Unit-Root test to demonstrate the level of stationary for the variables with the stock market index. Besides that, it also applies the Johansen's Cointegration test to measure the long-run relationship between Malaysia stock market and the macroeconomic variables. The Vector Error Correction Model (VECM) of causality will be apply in this test to see either there is a uni-directional or bi-directional relationship from the variables to stock market Malaysia.

**KEYWORDS:** Malaysia Stock Market Index, GDP, EXE, CPI, INT, MS.

## TABLE OF CONTENTS

<b>CHAPTER I: Introduction</b>	<b>1</b>
1.1 Chapter summary	1
1.2 Background of study	2
1.2.1 The Malaysia Stock Market	2
1.2.2 The Macroeconomic Variables	4
1.3 Problem Statement	11
1.4 Research Questions	12
1.5 Research Objectives	12
1.6 Assumptions	13
1.7 Limitations	13
1.8 Significant of the research	13
1.9 Scope of Study	14
1.10 Structure of Study	14
 <b>CHAPTER II: Literature Review</b>	 <b>15</b>
2.1 Introduction	15
2.2 GDP and the stock market	15
2.3 Exchange rate and the stock market	20
2.4 CPI and the stock market	25
2.5 Interest rate and the stock market	29
2.6 Money supply and the stock market	31
 <b>CHAPTER III: Research Methodology</b>	 <b>35</b>
3.1 Introduction	35
3.2 Data Description	35
3.3 Theoretical frame work	36
3.3.1 Stock Market Index	37
3.3.2 Gross Domestic Product (GDP)	37
3.3.3 Exchange Rate (EXE)	38
3.3.4 Consumer Price Index (CPI)	38

3.3.5 Interest Rate (INT)	39
3.3.6 Money Supply (MS)	39
3.4 Unit Root Tests	40
3.4.1 Augmented Dickey-Fuller (ADF) Test	40
3.4.2 Phillips-Perron (PP) Test	42
3.5 Johansen Cointegration Analysis	43
3.6 Vector Error Correction Model (VECM)	46
 <b>CHAPTER IV: Findings and Discussion</b>	 <b>48</b>
4.1 Introduction	48
4.2 Unit Root Test Results - ADF Test and PP Test	49
4.3 Johansen-Juselius Cointegration Test Results	53
4.4 Vector Error Correction Modelling Analysis (VECM)	58
4.5 Diagnostic Checking	62
 <b>CHAPTER V: Recommendation and Conclusion</b>	 <b>65</b>
5.1 Introduction	65
5.2 Conclusion	65
5.3 Recommendations	67
5.4 Personal Reflections	68
 <b>References</b>	 <b>69</b>
 <b>Appendices</b>	 <b>77</b>

**List of Tables**

Table 3.1	Description and source of data	36
Table 4.1	Mean, variance and Standard Deviation for the variables	48
Table 4.2	Augmented Dickey-Fuller (ADF) Tests	51
Table 4.3	Phillips-Perron (PP) Tests	52
Table 4.4	Johansen-Juselius Cointegration test results	55
Table 4.5	Vector Error Correction Modelling (VECM) Wald Test	59
Table 4.6	The residual analysis result from VECM model	63
Table 4.7	The stability testing on the dependent variables	64

## List of Figures

Figure 1.1	Time series plot of Malaysia Stock Index	4
Figure 1.2	Time series plot of Malaysia Gross Domestic Product	5
Figure 1.3	Time series plot of Malaysia Exchange Rate	7
Figure 1.4	Time series plot of Malaysia Consumer Price Index	8
Figure 1.5	Time series plot of Malaysia Interest Rate	9
Figure 1.6	Time series plot of Malaysia Money Supply	10
Figure 4.1	VECM short-run uni-directional causality effect	61

## Acknowledgement

I have learned a lot throughout running on this dissertation. I would like to truthfully thank all the people who helped me a lot to complete this task.

I would like to thank everyone who had contributed to successfully finish my thesis. Firstly, I would like to express my gratitude towards my supervisor Mr. Song Kuok Thong for his support and guidance in taking me ahead to complete the thesis, without his support and motivation it would have been impossible to reach the end road of success for the thesis.

I would like to take this opportunity to thank my family who kept me encouraged and motivated to complete thesis successfully without whom all this would have been impossible. I also appreciate all the support that given by them.

My special thanks to all my colleagues and friends in providing me with a helping hand for obtaining the data for the research process till keeping me focused in the thesis development.

*SAN CHER HUEI*

December, 2010

## Chapter I

### Introduction

#### 1.1 Chapter Summary

The impact of a country's domestic macroeconomic variables on its stock market has been one of the main issues to be investigated in macroeconomics. The macroeconomic fundamental plays a very important role in signaling the movement of stock price is well-documented in the literatures. From some existing studies such as Rahman et. al, 2009, they investigated on the macroeconomic determinates on Malaysia stock market and documented that there is a dynamic relationship between macro-variables and stock price.

There is broad consensus in literature showing there is a strong positive association between stock prices and economic growth indicators. This means a strong market performance always concurrent with an excellent economy stage. The movement of the macro economic variables lead to the fluctuations in stock price, affecting the real activity and thereby, the economic performance. Establishing of a clear lead-lag interrelationship is necessary for financial decision making and policy planning purposes in increasing the well being of the population. Thus, the nature and strength of the dynamic interactions among them (i.e. macroeconomic variable and stock price) is of high interest of researchers.



## **1.2 Background of study**

### **1.2.1 The Malaysia Stock Market**

The term 'stock market' is a concept for the mechanism that enables the trading of company stocks (collective shares), other securities, and derivatives. Bonds are still traditionally traded in an informal and, over-the-counter market. Commodities are traded in commodities markets, and derivatives are traded in a variety of markets. Stock market can be considering one of the most important sources for companies to raise fund. This may allow businesses to go public, or raise additional capital for expansion. Stock market can be considered as a corporation or mutual organisation which provides facilities for stock brokers and traders, to trade company stocks and other securities. Supply and demand in stock markets can be driven by various macroeconomic factors.

International investors and brokers begin to focus on emerging financial market instead of the developed market. Economic articles also concerned about the shortfall of the investors in developed market which perhaps caused by the shift of investors to the financial market. Returns and risk of the stock market has been found to be higher compared to developed market (Harvey 1995a). Asian emerging stock market appealed as investment icons in the global financial markets and received considerable attention.

The stock market in Malaysia can be traced back to the 1930s with the emergence of the Bursa Saham Kuala Lumpur. Kuala Lumpur Composite Index (KLCI) is Bursa Malaysia main index. The Kuala Lumpur Composite Index (KLCI) is generally termed as the local stock market barometer and it is the true representative of Malaysia financial market trends.

Bursa Malaysia is an important member of the global stock markets, with a history stretching back almost 80 years. In the year of 1960, the public trading was inaugurated with the public Malaysian market which was called the Malayan Stock Exchange. In the 1970s, it was split into the Stock Exchange of Singapore and the Kuala Lumpur Stock Exchange (KLSE) Board in 1973, following by the separation of Malayan and Singapore currencies.

Figure 1.1 below can conclude that the Malaysia stock market was still above at 1,200 in the composite index in the start of year 1997. It goes down dramatically when the Malaysia Ringgit attacked by speculators. This crisis started in Thailand with their financial collapse of the Thai baht. By the end of year 1997, the KLCI only at the level of not more than 600, and also the Ringgit Malaysia also felt to the worst ever. It was falling from 2.50 to not more than 4.10 to the dollar. Later on in the year of 1998, the side effect such as recession arrived. To overcome this, the bank Negara of Malaysia set a fix rate in exchange rate rather than free float. Therefore, the ringgit was fixed 3.80 to US dollar.

In the august of 2007, a worst financial crisis after the Great Depression by the International Monetary Fund started in the USA, the subprime crisis that started in the USA. This crisis leads to a financial shock and damaging the global financial system. This was very different from the economy crisis that Malaysia faced in the year of 1998. In that time, we are facing Gross Domestic Product (GDP) decline. This crisis was happened because the weakness in the U.S. financial industry. The country such as European countries and Japan were the countries that get the worst economic reduction. This external shock cannot be separate from Malaysia due to we are an export-dependent economy. Therefore, the Gross Domestic Product (GDP) was significantly not more than 0.1% in the fourth quarter of 2008. Compare to the previous three quarter in the year, it was in an average of 6%. Therefore, this brings down the KLCI in that time.

Figure 1.1 shows the time series plot for Malaysia stock index from January 1990 to Dec 2008.

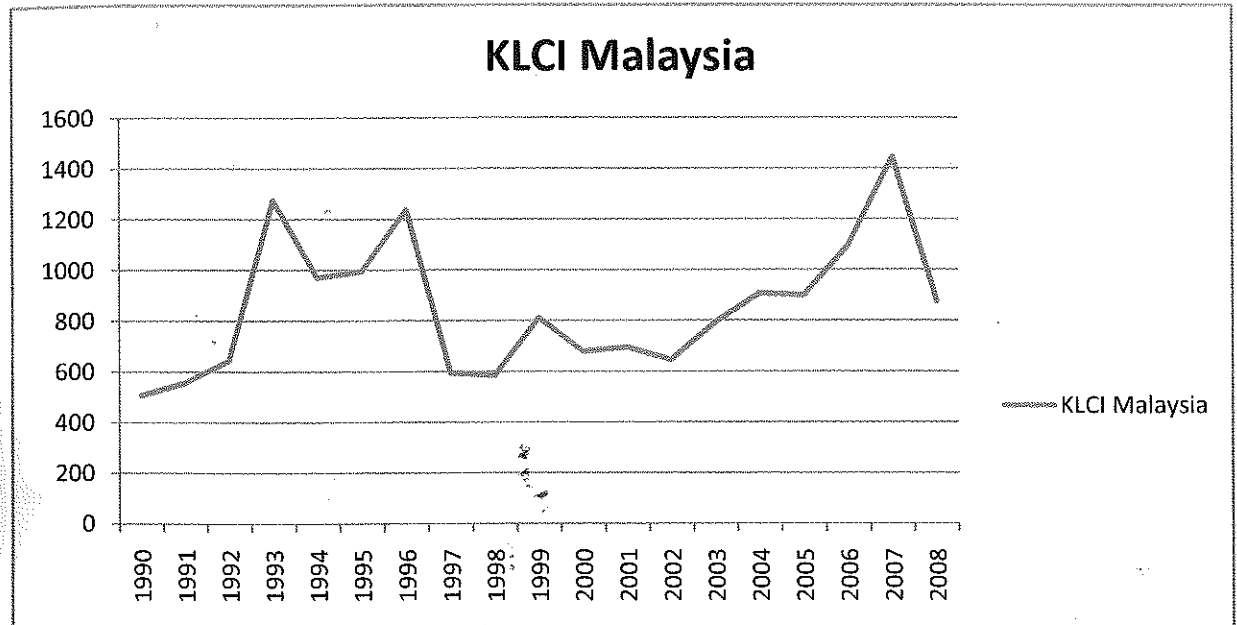


Figure 1.1: Time series plot of Malaysia stock index

### 1.2.2 The Macroeconomic Variables

There are also several macroeconomic variables that will give an impact on the movement of the Malaysia Stock market. Gross Domestic Product (GDP) can say is a number in economic that tells us the total value of a country in final goods and the services sectors in a particular year. The Gross Domestic Product (GDP) is important for a country to determining the monetary policy and also the domestic economic. The Gross Domestic Product (GDP) is an economic number that tells us the total value of all the finished goods and also services produced by resources that located in a particular country during a period of one year. There are basically three major groups that carry a high percentage in the Gross Domestic Product (GDP). The consumer goods already account for a nearly two-thirds of the total Gross Domestic Product (GDP) of a country. Basically there are few important factors that are not taken into count when calculating the Gross Domestic Product (GDP). Firstly, the imports and the income from outside the country are not included, so that the

impact on the exchange rate of a nation doesn't muddy up the number. Besides this, the effect of the inflation is not taking into consideration. Only the final goods of product are taking into account. The Gross Domestic Product (GDP) is also important for determining the domestic economic policies and monetary policies. These include durable goods, nondurable goods, and also services in this country. The second group can be considering as investment goods such as new plants and equipment, housing, and business inventory. The third major group is basically government sector which includes the services and also production of the public goods. The relationship between the Gross Domestic Product (GDP) and stock market was stated in some studies such as Wongbangpo and Sharma (2002). This was also supported by Dritsak (2005) in his study on Greek stock market, and also Rahman et al (2009) on a Malaysia context.

Figure 1.2 shows the time series plot for Malaysia gross domestic product from year 1990 to year 2008.

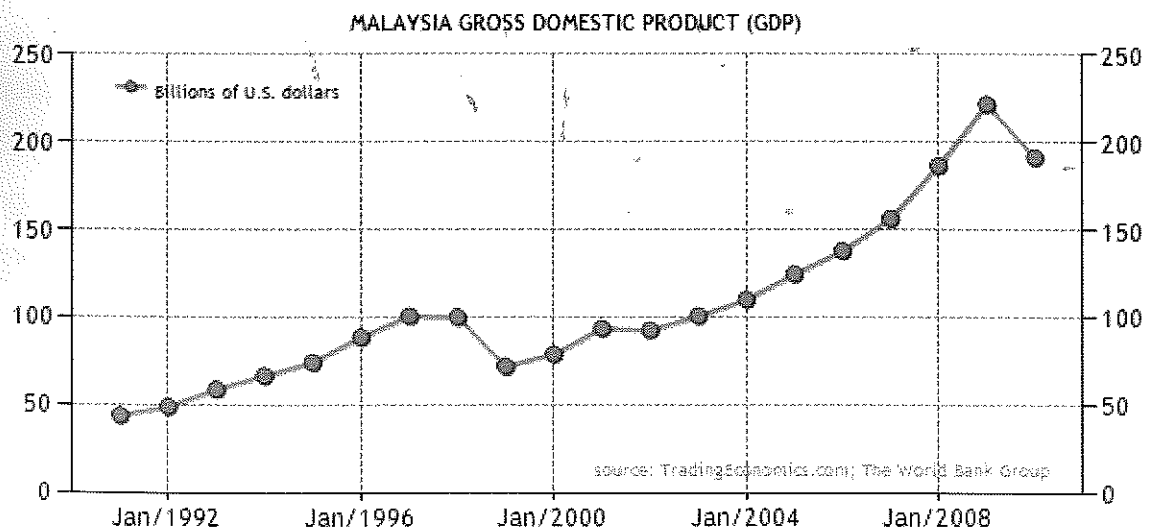


Figure 1.2: Time series plot of Malaysia gross domestic product

Based on the graph above (Figure 1.2), the Gross Domestic Product (GDP) of Malaysia had increased in the year of 1998 to the year of 2008 which illustrated above. We can see that there was a falling in GDP in the year of 1998 and in the year of 2009. This happened due to the Asian Financial Crisis that wrapped up much of Asia beginning in July 1997. Therefore, in the year of 1998, the

output of the Malaysia real economy declined sinking the country economy into the first recession for so many years. The construction sector contracted 23.5%, manufacturing shrunk 9% and the agriculture sector 5.9%. Overall, Malaysia gross domestic product sinks 6.2% in 1998. On the other hand, as we can see in the year of 2009, the GDP fall again due to the 2008 financial crisis in the United States is the excessive use of credit, especially in the housing market and the real estate bubble. It also considered by many economists to be the worst financial crisis since the Great Depression of the 1930s. The Government of Malaysia is continuing efforts to boost domestic demand therefore, the economy not only dependence on exports. However, exports as in electronics remain a significant driver of the Malaysia economy.

For Exchange Rate (EXE), it can be defined as the difference rate for exchanging currency of one country for currency of another country. In Malaysia, we don't have a flexible exchange rate system like others development countries (Pan et al., 2007). Exchange Rate (EXE) is normally used to converting one currency to another currency, as well for engaging in speculation or trading in the foreign exchange market. There are many factors which may influence on the exchange rate of a country, such as the interest rates, the inflation rate, and also the politics issues and also the economy growth in each single country. Exchange Rate (EXE) can be considered as a price either a ratio at which one nation's currency can be converted into another. Therefore, Exchange Rate (EXE) for every country is different. There can be floating exchange rate or either fixed exchange rate. A floating exchange rate may flow freely, exhibiting movement from day to day. A fixed exchange rate is influenced by the government central bank. The purpose of the fixed exchange rate is to procuring a more stable international trade. In the study of Rahman et al (2009) do mentioned on the Exchange Rate (EXE) is one of the factors of Malaysia stock market. Besides that, this was also supported by Ibrahim and Aziz (2003) in a Malaysia context and Wongbangpo and Sharma (2002) on ASEAN 5 countries. This was also supported by Agrawalla and Tuteja (2008) share prices and macroeconomic in India context and etc.

Figure 1.3 shows the time series plot for Malaysia exchange rate from year 1990 to year 2008.

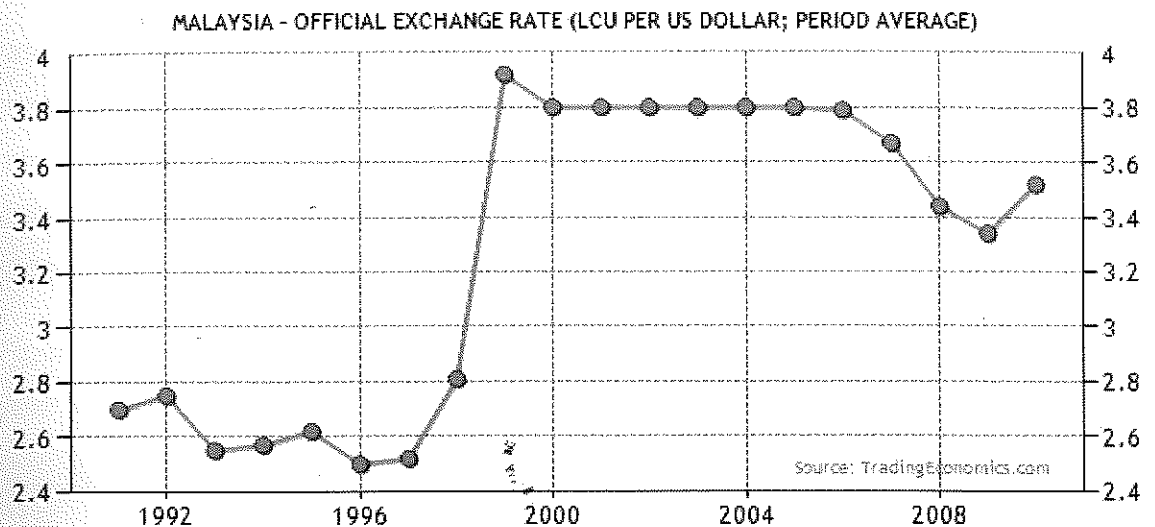


Figure 1.3: Time series plot of Malaysia exchange rate

Based on the graph above (Figure 1.3), the Exchange Rate (EXE) of Malaysia. During the year of 1998, the ringgit plunged below ringgit 4.7. The principal measure taken was to move the ringgit from a free float to a fixed exchange rate government. Malaysia government, Bank Negara fixed the ringgit at 3.8 to the dollar. Capital controls were imposed while assist offered from the IMF was refused by Malaysia. Therefore, the currency was pegged from September 1998 to 21 July 2005. After the year of 2005, the exchange rate was not anymore being pegged.

For Consumer Price Index (CPI), it is well known to be used as economic indicators. The index closely link in the changes of prices for goods and also services. The Consumer Price Index (CPI) also called as the inflation by many people. Can say that inflation rate is the major indicator for the Consumer Price Index (CPI). The Consumer Price Index (CPI) is used to measure the change in prices that pay for a fixed basket of goods and services for a country. The Consumer Price Index (CPI) itself has an impact on the price level of a product or services, because it is used to adjust the payments to individuals, such as cost of living, and also wage adjustments. To calculate Consumer Price Index (CPI) inflation rate, it is comparing the Consumer Price Index (CPI) for the

current month, with the Consumer Price Index (CPI) of the corresponding month of the previous year. Inflation is the way in which goods and services become more expensive, over a period of time. Inflation is normally express in a yearly rate. The relationship between Consumer Price Index (CPI) and the stock market was supported by Ibrahim (1999) in his study that was on this variable and Malaysia stock market. In Wongbangpo and Sharma (2002) study, it was doing on ASEAN 5 countries. On the other hand, this was supported in Dritsak (2005) study that was major on Greek stock market.

Figure 1.4 shows the time series plot for Malaysia consumer price index from year 1990 to year 2008.

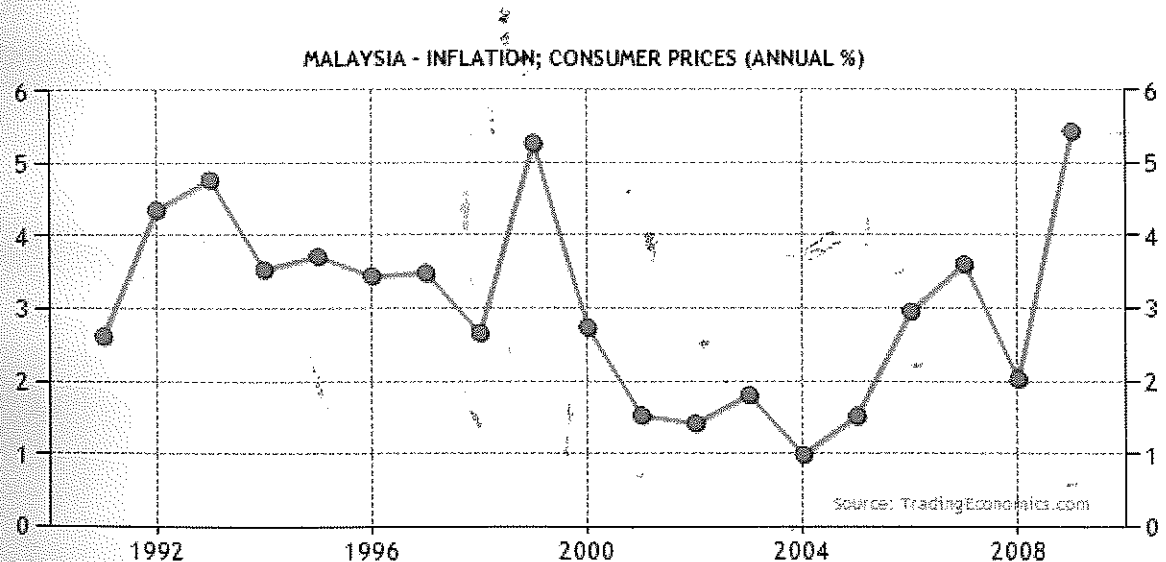


Figure 1.4: Time series plot of Malaysia CPI

Based on the graft above (Figure 1.4), the Consumer Price Index (CPI) of Malaysia. The consumer prices (annual %) in Malaysia was reported at 5.44 in 2008. Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.

On the other hand, the Interest Rate (INT) tells us about the cost of borrowing that charged by banks and the money that we put as saving. In Malaysia, the Interest Rate (INT) decisions are taken by the Central Bank of Malaysia (Bank Negara Malaysia). The official Interest Rate (INT) for Malaysia is the overnight

rate. Interest Rate (INT) keeps changing basically due to changes in the demand and supply of credit in the economy of a country. Interest Rates (INT) may be also different for different types of loans. This rate may help the government attempt to control the inflation rate. Therefore, the changes in the Interest Rate (INT) may affect the behavior of consumers, as well in the stock market. The stock price fluctuates as a result of the different expectations from the investors about the company at a different time. Due to the differences in the price, investors are willing to buy or sell shares at different prices. Study such as Wongbangpo and Sharma (2002) was doing on the ASEAN 5 countries that showed the relationship between these two variables. This was supported by Rahman et al (2009) in a Malaysia context. This was supported also in Dritsak (2005) study that was on Greek stock market.

Figure 1.5 shows the time series plot for Malaysia interest rate from year 2005 to year 2010.

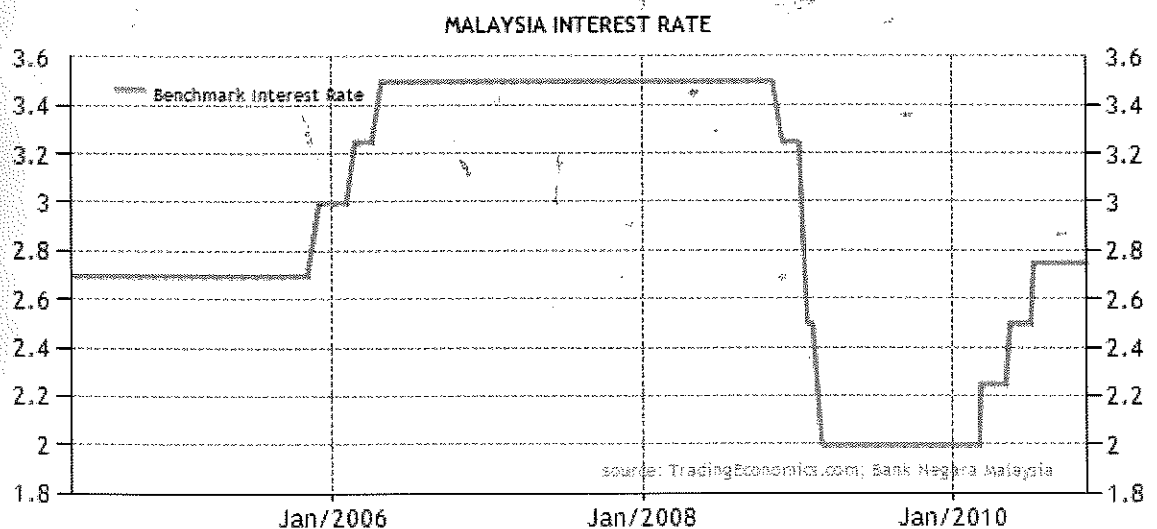


Figure 1.5: Time series plot of Malaysia interest rate

Based on the graph above (Figure 1.5), Malaysia interest rate decisions are taken by The Central Bank of Malaysia (Bank Negara Malaysia). The official interest rate is the overnight rate. From 2004 until 2010, Malaysia's average interest rate was 2.91 percent reaching an historical high of 3.50 percent in April of 2006 and a record low of 2.00 percent in February of 2009. The Malaysia benchmark interest rate was last reported at 2.75 percent.



Money Supply (MS) is also another macroeconomic variable that having a close relationship with stock market. There are several measures for the Money Supply (MS), such as M1, M2, and M3. The Money Supply (MS) is considered an important instrument for controlling the inflation rate. In order to control the money supply, regulators have to decide which particular measure of the Money Supply (MS) to target. The broader the targeted measure, the more difficult it will be to control that particular target. The movement of Money Supply (MS) may also affect the stock market. There are many argue that the increasing of the Money Supply (MS) may brings an increase in the stock market index and vice versa. Therefore, the past and current information on the growth of Money Supply (MS) is fully reflected in stock market prices so that the investors will not be able to formulate a profitable trading rule with the available information. The relationship between the Money Supply (MS) and the stock market was stated in the study of Ibrahim and Aziz (2003). Besides that, this was supported by Wongbangpo and Sharma (2002) in their study on ASEAN 5 countries. Study has been done by Agrawalla and Tuteja (2008) also supported this relationship in India context and also Rahman et al (2009) in a Malaysia context.

Figure 1.6 shows the time series plot for Malaysia money supply from year 1990 to year 2008.

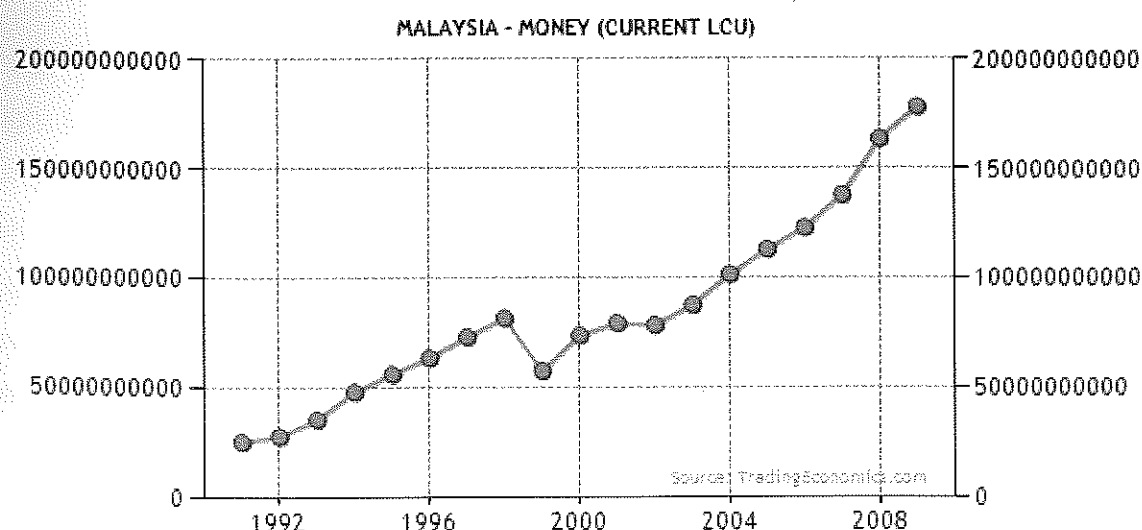


Figure 1.6: Time series plot of Malaysia money supply

Based on the graph above (Figure 1.6), the Money Supply (MS) of Malaysia. Malaysia money supply is continuously raised year by year. It only falls in the year of 1998 due to the financial crisis that faced in the whole Asian that started in Thailand.

### 1.3 Problem Statement

In Malaysia stock market, started in the year of 1977. The increasing investment by the international investor in the stock market is no longer a new issue since the past two decades. The historical trends show that investors shifted from a developed market to emerging financial market which poses a higher risk and a higher return. The stock market volatility appears to move rapidly across the nations. A clearer understanding of the relationship between macro-variables variables (Gross Domestic Product (GDP), Exchange Rate (EXE), Money Supply (MS), the Interest Rate (INT), and the Consumer Price Index (CPI)) and the stock market are important for investors, and even academics researchers. Study about the dynamic relation between macroeconomic variables and the stock market Malaysia (KLSE) is essential for the future development and growth of the Malaysia equity market. However, the exact relationships between the variables remain unclear.

Given the background of the study, the movement of stock market Malaysia might be caused by the dynamic movement of the macroeconomic variables or either the other way round. Study from previous researcher does also mention that the movement of Malaysia Stock market has an interaction with some macroeconomic variables. We are going to do this by using a different sample time period of years compare to the author in their study such as (1986 to 2008). We are going to see is there any difference of effect and the relationship between the variables. We are going to see that what the relationship between the variables and the stock market. On the other hand, we are going to see are the variables that we choose does really gives an impact on the stock market.

#### **1.4 Research Questions**

- (i) Are the selected macroeconomic variables such as (Gross Domestic Product (GDP), Exchange Rate (EXE), the Consumer Price Index (CPI) the Interest Rate (INT), and the Money Supply (MS)) show any impact on Malaysia stock market from the year of 1977 to year 2008?
- (ii) What is the relationship between these macroeconomic variables and the stock market in the short run?
- (iii) What is the relationship between these macroeconomic variables and the stock market in the long run?

#### **1.5 Research Objectives**

- (i) To identify the impact of the selected macroeconomic variables such (Gross Domestic Product (GDP), Exchange Rate (EXE), the Consumer Price Index (CPI), the Interest Rate (INT), and the Money Supply (MS)) that determine the stock market of Malaysia.
- (ii) To identify the relationship in the short-run and long-run among macroeconomic variables i.e., the Gross Domestic Product (GDP), Exchange Rate (EXE), the Consumer Price Index (CPI), the Interest Rate (INT), and the Money Supply (MS) and the Malaysia stock market.
- (iii) To identify the relationship in the short-run and long-run among macroeconomic variables i.e., GDP, EXE, CPI, INT, MS and the Malaysia stock market.

## **1.6 Assumptions**

We assume that only the macroeconomic factors bring influence towards the stock market, and the external factors are not affecting the stock market in the period that we have chosen. A proper awareness from the investors between the relationship on the selected macroeconomic variables and stock market may lead investors have a better understanding on the stock market and the linkage with the economic variables.

## **1.7 Limitations**

The study does have some limitations. We are unable to look in-depth what is the effect within the pre-economy crisis and also the post-economy crisis on the stock market Malaysia and the economic variables for the period that we have chosen. Therefore, additional work can be done on other macroeconomic variables that can also give an impact on the stock market.

## **1.8 Significant of the research**

While the existence of numerous empirical studies investigating the issue on developed markets, yet empirical analyses for emerging markets such as Malaysia are limited. The exact patterns of the interactions and the dominant variables in the relationships between the variables are still remained unclear. This study hopes to contribute to literature in such aspect.

We are going to investigate the interrelation of the selected macroeconomic variables, i.e., the Gross Domestic Product (GDP), industrial production index, the Consumer Price Index (CPI), the Money Supply (MS), the Interest Rate (INT), and the Exchange Rate (EXE) on the Malaysia stock market. Since Malaysia stock market is interact closely with macroeconomic fundamentals, adequate financial or regulatory policy could bring favourable outcome for a nation's economic growth as a whole.

This study may provide an assessment of the stock market efficiency of Malaysia. It increases the predictability and efficiency of the stock market which allowed investors to make better decision by make used the past information of the macroeconomic-variables from study that have been do.

The research also holds an implication for other small emerging market for the purpose of policy designation or economic development. In short, establishing of a clear lead-lag interrelationship could provide more valuable information for investors, policy makers and even academic researchers. A clearer understanding of stock market determinants is necessary for the purpose of pricing and decision making in investments and for hedging and regulatory policy purpose.

### **1.9 Scope of Study**

The research mainly focuses on either the selected macroeconomic variables influence the Malaysia stock market. This study will arrange accordingly with the research question, research objective. The relationship between the variables will be identify and examine to let investors have a better idea in which economics factors that give an influence to stock market. Therefore, they may able to get rid from the difficulty in investing in stock market.

### **1.10 Structure of Study**

The remainder of the study is organized as follow. Chapter 2 will provides a brief overview of the literature related the similar topic. Chapter 3 will present the data employed and outline the methodology applied. Chapter 4 will report the analysis of the empirical results and the final section contains some concluding remarks for the study.

## Chapter II

### Literature Review

#### 2.1 Introduction

To further investigate on the dynamic interactions between selected macro-economic variables and the Malaysia stock market, there are several studies that mention about some macro-economic variables either they were correlated or cointegrated between the variables and the stock market. There are also studies mentions about the causal of these macro-economic variables on the Malaysia stock market. The dynamic linkage between the macroeconomic variables and the stock market will be discussed.

#### 2.2 GDP and the stock market

There are several studies that analyze on the relationship between the Gross Domestic Product (GDP) and the stock market was documented in these recent years. The existing literatures may let us get a deeper understanding on the relationship between these variables.

According to V. Rasiah (2010) studies, he investigates the long-run relationships and short-run dynamic interactions between the stock market and industrial production rate in Malaysia over the period of year 1980 to 2006. He applied Unit-root test, the Johansen's Cointegration test, the Vector Error Correlation Model (VECM), and also the Variance Decomposition test in the study. The study showed that the variable is stationary at the first difference  $I(1)$ . In the Cointegration Test, there are also a significant positive relationship between the selected variable and the stock market returns.

This was supported by others researcher such as Kwon and Shin (1999) for South Korea, Mayasami and Koh (2000) for Singapore. He suggested that the Malaysia stock market is not seems to be efficient in using it to further forecast the fluctuation on the stock market. Moreover according to Pilinkus (2009), he examines the relationship between stock markets and macroeconomic force such as GDP at Lithuanian from December 1999 to March 2008. In the study, he applied the Granger causality tests. The Granger causality tests have been applied to verify is there any relationship or statistical causality between stock market prices and the selected macroeconomic variable such as GDP. In his studies, showed that the variable (GDP) is stationary at the first difference  $I(1)$ . Therefore, in the Granger causality tests we can see that the GDP is Granger caused by the stock market index. The result showed that the fluctuation of GDP is led by the movement of the Lithuanian stock market (OMXV) index. Therefore, the stock market index movement can give prediction on the future tendency of GDP.

Other than these, from the study by Mahmood and Dinniah (2009), they do examine on the dynamic relationship between Stock market return and the macroeconomic variable such as industrial output in Six Asian-Pacific Countries (Australia, Thailand, Hong Kong, Japan, Korea and also Malaysia) on the short run and long run. The data that obtained in this study is from January 1993 to December 2002. Both cointegration test such as Engle and Granger (1987) and Johansen and Juselius (1990) are applied in this study. The selected variables are stationary at the first difference  $I(1)$ . From the result, it provides evidence that there is a long-run relationship between the variables in all selected countries except for Malaysia. From the Error Correction Model (ECM) test, showed there don't have any short-run relationship between these two variables, expection for Thailand, there is cointegration between the industrial output and the stock market in the short run. To conclude this study, can say the selected variable industrial output seems to have a negligible impact on the stock market performance.



According to Ekaterini Tsouma (2008), he investigated on the dynamic interdependent on stock returns and economic activity (industrial production index) in the mature and emerging market. In his study, he used monthly data that cover from January 1991 to December 2006 as the sample period for this study. The study is going to examine on the stock returns and the industrial production index either they are having a uni-directional or bi-directional relationship. The bivariate VAR test and the Granger causality test have been employed in this study. The empirical result showed the industrial production index have a mixed effect on the stock market returns, and there is both positive relationship in nine cases and negative relationship in seven cases. It also showed that doesn't show any bi-directional Granger causality relationship between both of the variables. There is just one-directional causal (uni-directional) from the stock market returns towards the industrial production index.

According to Sen and Ghosh (2008) study, they examine on the relationship between the macroeconomic variable (GDP) and the Indian stock market. The sample period that been use in their study are a total of 132 months for both variable from January 1995 to December 2005. They applied the unit root test, the Johansen's cointegration test and also the Error Correlation Model (VECM) causality test. From the result in the study, it showed that the variables are stationary at the first difference  $I(1)$ . Result showed there are also significant positive relationship between the stock market and the selected macroeconomic variable (GDP). Besides that, it also showed there is joint positive effect if the macroeconomic variables. The results of ECM causality showed that the percentage changes on the (GDP) have a positive effect on the percentage changes on stock market.

In the Agrawalla and Tuteja (2008) study, they examine on the relationship between the India stock market index and the macroeconomic variable (GDP). The sample period that they examine was between the period of year 1965 (November) to year 2000 (October). The data of the study was obtained from International Financial Statistics (IFS) database. They do also apply the unit



root test, the Johansen's cointegration test, and also the vector error correction model (VECM) causality test. The result reported the GDP do not significantly respond to the stock market in the long-run. The VECM result showed that there is cointegrated between the both variables. The causality effect is running from the economic growth proxied by GDP to share market price index and not the other way round. They conclude either the share market to be the mirror or reflection of the GDP activities in India. Therefore, the Bull Run on the stock market cannot be considered as the major factors for the movement in the GDP.

According to Dritsaki (2005), he examine on the long-run relationship between the Creek Stock Market Index (GEN) with the macroeconomic variables such as GDP. Data from the period September 1988 until June 2003 was been taken for this study. The study applied the unit root test, Johansen's cointegration test and also the Granger Causality test. As a result in this study, found that the variables are stationary at the first differences  $I(1)$ . Therefore the variables are also cointegrated with the stock market. Also found that there is significant causal relationship between stock market index and the macroeconomic variable. There is a bi-directional causality between these two variables. He does mentioned about these two variables are mostly having a long-run relationship, and the stock market is normally influence by the macroeconomic variable (GDP). In another study, Wongbangpo and Sharma (2002) examine on the relationship between the exchange rate and the stock price for the ASEAN-5 countries (Indonesia, Malaysia, Philippines, Singapore, and Thailand). They employed both the Augmented Dickey-Fuller (ADF) and the Phillips Perron (PP) test to examine the monthly data from year 1985 to year 1996 that collected from Internal Financial Statistics (IFS). They also test on the causal relationship by using the Granger causality test through the vector error correction model (VECM). They found that there is positive relationship between GNP and the stock market price for the five different nations (Indonesia, Malaysia, Philippines, Singapore, and Thailand) in the long-run. The Granger causality test showed that the stock market for the 5 selected nation Granger-cause towards the GNP.

According to Ibrahim and Aziz (2001) studies, they analyze about the dynamic relationship between the stock market Malaysia and the GDP. The sample period that used in the study is a monthly data that started from January 1977 to August 1998. They applied the standard Augmented Dickey-Fuller (ADF) test and also the (PP) unit root tests. Besides that, Johansen and Juselius (1990) Johansen-Juselius cointegration tests, and also regressions of the VAR model was been applied in the study. The GDP is noted to be at the first difference  $I(1)$  by the unit-root test. The long run relationship between the GDP and the stock market have a positively relationship. They also found that the GDP is having a uni-directional granger cause towards the Malaysia stock market. Therefore, it seems to be inefficiency for Malaysia stock market to change the macroeconomic variable such as GDP. For investors, they may need to take considerate on the fluctuation in macroeconomic variables before make any decision.

According Kwon and Shin (1999), they investigate the causality on the macroeconomic variable such as GDP (industrial production) and stock returns in Korea. They obtain a monthly data in the study that collected from January 1980 to December 1992. Besides that, they do employ the Augmented Dickey-Fuller test (ADF) unit root test and also examined on the causality relationship by applying the Granger causality test from a Vector Error Correction Model (VECM). The finding of the study showed that the GDP is cointegrated with the stock price index in the long-run relationships. Even though the stock market price index and the GDP (production index) are affecting each other, but the stock market price index is not a leading indicator for the economic variables

In contrass, in the study of Maysami and Koh (2000), they examine on the relationship between the GDP (industrial production) and the Singapore stock market indices. A monthly data for the sample period of January 1988 to January 1995 is used in this study. The Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) test are applied, and also the vector error-correction (VECM) test is conducted in their study. They found that the variable are not integrated at the order of first difference  $I(1)$ . For the empirical results, it showed

there is no significant cointegrating between GDP with the Singapore stock market.

### 2.3 Exchange rate and the stock market

There are several studies that analyze on the linkage between macroeconomic variable such as exchange rate and the stock market was documented in several studies of literature for so many years.

According to V. Rasiah (2010), he investigates on the short-run and long-run relationships dynamic interactions between Malaysia stock market and the exchange rate in Malaysia over the period of year 1980 to 2006. He applied the Unit-root test, the Johansen's Cointegration test, the Vector Error Correlation Model (VECM) test, and also the variance decomposition in the study. With the unit root test, result show that it strongly support that the selected macroeconomic variable is non stationary in the level  $I(0)$ , but stationary at the first difference  $I(1)$ . It also shows that there is a positive relationship in the long-run between the stock market return and the exchange rate. He concludes the study by mentioning the exchange rate does signal change the stock market and the short-term dynamic relationship between the variables exist. He mentioned that the economic activities do play a role in the stock market of Malaysia. Rahman et. al (2009) also do on the same macroeconomics determinants on the stock market in Malaysia for the period of year from 1986 until 2008. They applied the unit root ADF (Augmented Dickey-Fuller) and PP (Phillips-Perron) test, the Johansen's Cointegration test and also the Vector Error Correlation Model (VECM) test. Result shows that the exchange rate and the stock market have a negative relationship. They found that there is a long-run effect between the exchange rate and stock market with the VECM frame work. As documented in Phylaktis and Ravazzola(2005) study, they analyze on the long-run relationship and the short-run relationship linkage between the stock prices and exchange rate for five Pacific Basin countries such as Hong Kong, Malaysia, Singapore, Thailand, and Philippines from the period of year 1980 to the year 1998 by applying the Johansen's cointegration methodology

and the multivariate granger causality test. The result showed that the exchange rate and the stock market are positively link to each other, and it found that the stock market didn't determined by the exchange rate, but the financial crisis had a temporary effect on the long-run towards the stock market. On the other hand, Zubaidi *et al.* (2002) also investigate on the stock market and the ringgit exchange rate. They used data from year of 1976:Q1 to 1996:Q4 in the study of RM/US and the RM/JY exchange rate. The Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) unit root test, and also the Johansen-Juselius (1990) cointegration test were conducted in their study. The result showed that the relationship between the stock market and the exchange rate are a mixed result. This is due to which currency they are comparing in the exchange rate. (Smith, 1992a; Solnik, 1987) mentioned that there are positive relationship exists between the variables, but (Soenen and Hennigar, 1988) showed there are strongly negative relationships between these two variables. Therefore, the stock market is significantly affecting the exchange rate. Moreover, according to Sen and Ghosh (2008), they do also examine on the relationship between exchange rate and the Indian stock market. In the study, they used a total of 132 months for each variable from January 1995 to December 2005. The Phillips-Perron Unit Root Test, the Johansen's cointegration test and also the Vector Error Correlation Model (VECM) causality test was applied in their study. The result showed that there are significant relationship between the stock market and the exchange rate. From the results of ECM causality test, showed that most of the previous liquidity affects the current year's liquidity.

In another study, Anthony and Kwame (2008) analyze on the real exchange rate that affect the performance of the Ghana stock market from the year 1991 to 2005 in quarterly. They employed the unit root test, the cointegration test and aslo the Vector Error Correlation Model (VECM) to examine either there is any short-run or long-run relationships between the variable and the stock market. The result shows that the exchange rate did have a positive relationship between the stock market, and investors benefit from the exchange-rate due to result of domestic currency depreciation, but it expected that the stock market

will suffer from the exchange rate losses. In this study, they emphasized on the macroeconomic variable such as exchange rate and the stock market performance in a small country.

According to Agrawalla and Tuteja (2008) on their study, they examine on the relationship between the exchange rate and the stock market at India from the year 1965 (November) to 2000 (October). The unit root test, the Johansen's cointegration test, the Vector Error Correlation Model (VECM) and also the causality test was applied by them in the study. It showed that the exchange rate is stationary at the  $I(1)$ . Beside this, it also shows that the exchange rate and the share market are having a long-run relationship. The author concludes his study by mentioning the bull run of a share market cannot be taken by a leading indicator such as exchange rate.

Further on, Kwon and Shin (1999) investigated on the causality of exchange rate and the stock returns in Korea from January 1980 until December 1992 in their study. They do employ the Augmented Dickey-Fuller test (ADF) test and the Granger causality test from a Vector Error Correlation Model (VECM). Result showed that the stock market price index and the exchange rate are simultaneously affecting each other. The study showed that the stock price index is cointegrated with the exchange rate. Other than this, it also showed a long-run relationship with exchange rate. He summarize that the stock market price index is not a leading indicator for the economic variables (Fama, 1991; Geske & Roll, 1983).

From the study of Ibrahim and Aziz (2001), they do also analyze on the dynamic linkage between the stock market Malaysia and exchange rate from the year 1977 to 1998. They applied the Augmented Dickey-Fuller (ADF) and also (PP) unit root tests, the Johansen-Juselius cointegration tests, and also the regressions of the VAR model in the study. In long-run, they found that there is a negative relationship between stock price and the exchange rate which means, when the currency depreciation is associated with the decline in the stock market.



Mahmood and Dinniah (2009) also examine on the dynamic relationship between Stock return and exchange rates in Six Asian-Pacific Countries such as Australia, Thailand, Hong Kong, Japan, Korea and also Malaysia from January 1993 to December 2002. To analyze on the relationship between the variables, the cointegration test such as Engle and Granger (1987) and Johansen and Juselius (1990) are performed in this study. The study provides evidence that there is a long-run relationship between the exchange rate and the stock market in all the countries. It also support that the cointegration hypothesis with exception for Malaysia. Result also show that there is only cointegration in the short run between the exchange rate and stock price in Hong Kong.

Another study was done by Maysami and Koh (2000) on the dynamic linkages between exchange rate and the Singapore stock indices from January 1988 to January 1995. The Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) unit root test and also the Vector Error Correlation Model (VECM) test are both used in the study. The empirical results showed that changes in exchange rate were significant cointegrating with stock market index in the short-run and in the long-run. Also suggested in the study, the changes in the U.S. and Japan stock market will also affect the changes in the Singapore stock market in the long-run.

Another study by Mukherjee and Naka (1995) was regarding about the dynamic relationship between the exchange rate and the Japan stock market from January 1971 to December 1990. In their study, the ADF and PP unit root test, the Johansen and Juselius (1990) cointegration test, and also the Vector Error Correlation Model (VECM) method was been applied in the study. As the result showed that there is equilibrium between the variables and also the Japanese stock market is cointegrated with the exchange rate.

According to Ibrahim (2000) study, he does on the interaction between the exchange rate and the Malaysia stock market from the year 1979 to 1996. He applied the unit root ADF and PP test, the bivariate and multivariate cointegration test and also the Granger causality test in his study. As in his