SCITECH
RESEARCH ORGANISATION

Volume 8, Issue 1

January 30, 2017

Journal of Research in Business, Economics and Management
www.scitecresearch.com

Relationship between Macroeconomics and Stock Market: Empirical Study in Malaysia

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Abstract:

This paper attempt to investigate the relationship between macroeconomic variables and FTSE Bursa Malaysia KLCI, the samples are divided into 2 groups such as foreign macroeconomic variables and local macroeconomic variables, foreign macroeconomic variables consist of Gold Bullion LBM price and Dow Jones Index, meanwhile local macroeconomic variables consist of Consumer Price Index, Base Lending Rate, Exchange Rate.

This study employs data from Jan 2000 to Dec 2013 which contains a monthly data set of 168 observations. There are 3 methodologies used in this study to investigate the relationship, the first test is Unit Root test which used to test the stationary of each variable, the results indicate that all the variables are stationary in first difference, this is important to use stationary variables because if the variables are not stationary, it might lead to spurious regression. The second methodology is Johansen & Juselius Co-integration test to investigate the long run relationship among these variables, the results show that the foreign macroeconomic variables and local macroeconomic variables have long run relationship with KLCI and significant. Next, this study will investigate the short run relationship between macroeconomic variables and KLCI, the results indicate that Gold, BLR and CPI can granger cause KLCI and significant at 1%, 5% significance level respectively.

Index Terms: FTSE Bursa Malaysia KLCI; Foreign Macroeconomic Variables; Local Macroeconomic Variables; Unit Root Test; Johansen & Juselius Co-Integration Test.

1.0 Research Background

The stock market is one of the sources that play an important role in contributing to the economic growth of a country. Government, industry, central bank and investor of the country are vital to keep a close watch on the happenings of the stock market. According to Zukarnain & Sofian (2012), the stock market should be theoretically closely linked with the macroeconomic variables of the country because stock prices are the discounted present value of expected future cash flows. Therefore, there were a few numbers of studies that have been conducted to determine the existence of the relationship between macroeconomic variable and stock market.

The Malaysia stock market was formerly known as Kuala Lumpur Stock Exchange (KLSE) and was renamed to Bursa Malaysia Berhad at year 2004. This is the only stock exchange in Malaysia and there are total 909 companies (as at 3-Mar-2014) which were listed on it inclusive of 800 companies listed in main market and 109 companies listed in ACE market. All the 909 companies are located at different sectors in Bursa as there are total of 14 sectors in Bursa Malaysia such as Closed-End Funds, Construction, Consumer Products, Finances, Hotels, Industrial Products, IPC, Mining,

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Plantations, Properties, REITs, SPAC, Technology, Trading and Services. Kuala Lumpur Composite Index (KLCI) is a part of Bursa Malaysia in representing the top 30 companies and is recognized as Malaysia stock market index since 1986 and now it is known as FTSE Bursa Malaysia KLCI. There are many important macroeconomic variables to represent the economic growth of a country such as GDP, CPI, interest rate, money supply and others. They are similar with the stock market where both also are important to the country growth. Therefore it is worthy for us to determine whether the macroeconomic variable can explain the stock market or vice versa.The knowledge of the factors which can influence the behavior of stock market and macroeconomic variables has attracted the attention not only from investors but also to the policy makers for a long time but it is still hardly to determine whether which macroeconomic variables can influence the stock market directly. For investors such as retail investors or institutional investors, by knowing the relationship between the macroeconomic variables and stock market can help them appropriately forecast stock price movement, whereas for government sector such as policy makers, it is important for them to identify the relationship between stock market and macroeconomic variables because they can use the stock market as a leading indicator to predict future macroeconomic variables if the stock market leads macroeconomic variables.This study not only include with the local macroeconomic variables but also with foreign macroeconomic variables in order to study the effect of it towards Malaysia stock market. The local macroeconomic variables adopted in this study are as CPI, ER and BLR, whereas for foreign macroeconomic variables adopted in this study are Dow Jones Industrial Average (DJIA) and Gold.

1.1 Problem Statement

Recently, there are many studies to investigate the relationship between stock market and the country macroeconomic variables. The main reason is because the stock market has been recognized to have a prominent role in a country economic performance. It is very crucial for investors in the equity market, bank in the financial institution as well as policy makers to discover the relationship between macroeconomic variables and the movement of the stock market because it can help investors and financial institutors to forecast the stock price movement by discovering the relationship and well diversified their investment portfolio in order to increase the return for them. Besides that, it is important for policy makers to discover the relationship between them as well because the policy makers need to estimate the impact of the government policies and predict the future movement of the stock market meanwhile the policy makers can use it for risk management practices. Thus, if the stock market volatility leads the macroeconomic variables volatility, they can use the stock market as a leading indicator to predict the future movement of the country macroeconomic variables.

Even though, there are quite a number of empirical studies on the relationship between macroeconomic variables and stock market but most of these studies focused on the developed countries such as Europe countries over the last several years and less studies on the developing countries such as Indonesia, Thailand, Malaysia, China, India, Cambodia, Vietnam, Philippine and others. Specifically, how do these developing countries stock market react to the changes in the macroeconomic variables still remain as an interesting area for researchers to study. This study will concentrate on Malaysia stock market reaction to the changes of the macroeconomic variables.

Most of the previous studies used Money Supply M2 or M3 (Zukarnain & Sofian, 2012; Syed, Zamri & Lai, 2011; etc), Exchange Rate USD/MYR (Mirza & Hashem, 2013; Mohamed, Wisam, Aris & Md Fouad, 2009; etc) and Industrial Production Index GDP (Caroline, Rosle, Vivin & Victoria, 2011; Zukarnain & Sofian, 2012; etc) as their macroeconomic variables but this study extend the previous literature to address the question whether local and foreign macroeconomic variables affect the stock market by using a set of different combination of local and foreign macroeconomic variable such as Exchange Rate (MYR/SGD), Gold Bullion LBM and Dow Jones Industrial Average (DJIA) which is seldom used in other studies. The main purpose of using MYR/SGD, Gold Bullion LBM and Dow Jones index as independence variables because they lead an important part in affecting the economics of a country. The currency of Malaysia Ringgit toward Singapore dollar has fallen to a new low rate in this year, this will influence the economic growth of our country because when our currency has depreciated, our purchasing power towards foreign goods will be reduced and this means that we need to use more money to purchase foreign goods compare to the past. In the world of gold price, it has reached to a new high price in this year, this might cause the people to invest in gold for hedging purposes instead of investing money in the stock market. Besides that, our stock market is being influenced by the US stock market and when the US market drop, usually by the next day Malaysia stock market will drop as well, this is mainly because previously our country currency is pegged to US dollar, so the US country economic can influence our country to a certain extent.

1.2 Research Objective

i) To examine the stationarity of each variables used in this study.

ii) To examine the co-integration relationship between all macroeconomic variables with the Malaysia stock market (KLCI)

iii) To examine whether each local or foreign macroeconomic variable can granger cause Malaysia stock market

iv) To examine whether Malaysia stock market can granger cause each local or foreign macroeconomic variables

1.3 Research Question

    i)   Do all the variables used in this study are stationary?

    ii)   Does co-integration relationship occur between macroeconomic variables and Malaysia stock market?

    iii)   Can each of the local and foreign macroeconomic variables granger cause Malaysia stock market?

    iv)   Can Malaysia stock market granger cause the local and foreign macroeconomic variables?

1.4 Significance of the Study

This study intends to investigate the relationship between Malaysia stock market (KLCI) and other macroeconomic variables such as exchange rate (MYR/SGD), Gold Bullion LBM and foreign macroeconomic variables such as Dow Jones Industrial Average (DJIA). The main contribution of this study is to provide the information of the relationship for these macroeconomic variables and Malaysia stock market and how the response of the Malaysia equity market to the macroeconomic variables fluctuation for the year from 2000 to 2013 which using monthly data.Besides that, this study will provide useful information for investor and policy maker because all these macroeconomic variables used in this study stand an important tool for participants such as retail investors, institutional investors, hedgers, speculators, policy maker and so on. For all investors, discovering this macroeconomic volatility can help them appropriately forecast the stock market movement. They can use these macroeconomic variables as an indicator for their stock market movement as well as helping them in managing their investment portfolio and therefore to earn profit. On the other hand, if the stock market can granger causal these macroeconomic variables, then it will be an advantage to policy makers because they can use stock market as a leading indicator to predict future macroeconomic and will be better equipped to formulate future macroeconomic policies.This study extends the previous studies for the relationship between macroeconomic variables and stock market by updating the data to the latest data, so this will provide more accurate information and benefit others. Other than that, this study used local and foreign macroeconomic variables such as Exchange Rate (MYR/SGD), Gold Bullion LBM and Dow Jones Industrial Average (DJI) which seldom been adopted by other researchers.

1.5 Assumption of the Study

This study assumes that the macroeconomic variables such as Exchange Rate (MYR/SGD), Gold Bullion LBM and Dow Jones Industrial Average (DJI) index used are important and will influence the economic growth of a country to a certain extent.

1.6 Chapter Layout

The rest of this paper is organized in as follows. Chapter 2 reviews the previous studies on the relationship between the macroeconomic variables and stock market. Chapter 3 provides the methodology being used in this study. Chapter 4 presents the empirical results while chapter 5 discusses about the findings and conclusion.

1.7 Conclusion

Basically in the first chapter, this is just an introduction for the whole study. This chapter will introduce what is the macroeconomic variables will be used and which stock market will be focused in. After that, is the purpose for this study and how this study will benefit to other peoples such as investors, policy makers and researchers.

2.1 Literature Review

There were a number of researches that have been conducted previously and try to find the indicator to predict the future movements of the stock market, mostly of the previous researchers try to investigate the existence of the relationship between stock market and macroeconomic variables which can eventually benefit to the public.The common local macroeconomic variables using by the previous studies were money supply, interest rate, exchange rate with US dollar, foreign currency reserve, industrial production index, inflation and etc. Meanwhile for the foreign macroeconomic variables were US interest rate, US inflation, US industrial production index and etc. Besides that, the seldom used macroeconomic variable Islamic interbank rate being used as well to investigate the existence of the relationship between this variable with the Malaysia Islamic stock market KLSI (Mohd. Yahya et al., 2009). Meanwhile, this study had found that some previous studies have been conducted in developed countries as well as developing countries. For example, in Caroline et al. (2011) and Md. Mahmudul & Md. Gazi (2009), they investigating the relationship between macroeconomic in developed and developing countries such as Malaysia market, China market, India market, US market, Germany market, Italy market, Japan market and etc.In order to determine the relationship between the macroeconomic variables with the stock market, the methodology they used previously were such as co-integration relationship, causality relationship, unit root test, impulse response function and etc. The relationship between stock market and macroeconomic variables have been studied extensively especially in developed countries, only several studies have been done in developing country such as Malaysia, Thailand and Vietnam.

There are several methodologies which can be used to investigate the relationship between the stock market and macroeconomic variables such as causality test, co-integration test and also unit root test. Causality analysis is to test the causality effect in both directions to determine whether the macroeconomic variables can only granger cause stock market or vice versa or in both directions (Aisyah, Noor & Fauziah, 2009; Liu & Wan, 2012; Praphan & Subhash, 2002; Abdullah, Sarkar & Omar, 2012; Osamah, 1999), this method is popular because of this function. In the study of Khaled & Le (2009), Anthony & Kwame (2008), Abdullah, Sarkar & Omar (2012), Shiu (2009), Mohamed et. al. (2009), they have adopted with unit root test before they started their relationship analysis to test for the stationary of these variables to avoid the spurious results. The time series is considered as stationary if a series is mean reverting, means that the series repeatedly returns back to its means and does not have a tendency to drift (Mohamed et. al., 2009). Meanwhile for co-integrating test, it is to test for stock market efficiency with respect to macroeconomic variables in long run (Rajen & Qiao, 1997).It is undeniable that the stock market of a country plays an important role in influencing the economics of that country. There were many previous studies on the relationship between stock market and macroeconomic variable for the past few years. There are a lot of macroeconomic variables in a country and different macroeconomic variable may influence the stock market in a different degree. This is the reason that attracts the interest of many researchers toward this type of study. Study like this can provide usable information for investors in their investment as well as policy makers in their decision making. Researchers might select different macroeconomic variables for different countries and also different time period for the research to examine the relationship between it.

Moreover, there were many studies about how macroeconomic variables affect the stock market have been investigated long time ago such as Chong & Tai (1999) and Rajem & Qiao (1997), these two studies were conducted more than thirteen years ago. According to Chong & Tai (1999) and Rajem & Qiao (1997), they have stated that the relation between stock market return and fundamental economic activities is well documented for developed countries such as Europe countries and US country before their studies had been conducted, whereas less research been conduct in developing countries such as Taiwan, China, Malaysia and etc.From the previous studies until present, it is have shown that most of the macroeconomic variables significantly have an effect on the stock market (Aisyah, Noor & Fauziah., 2009; Zukarnain & Sofian, 2012; Liu & Wan, 2012; Caroline et. al., 2011; etc) but it is hardly to see any new combination for these macroeconomic variables and explaining the relationship with Malaysia stock market, most of them using local macroeconomic variables instead of foreign country macroeconomic variables. Thus, this study attempts to use other macroeconomic variables which seldom used by other researchers for seeking their relations with FTSE Bursa Malaysia KLCI. This study has adopted with local macroeconomic variable as well as foreign macroeconomic variables.

2.2 Malaysia Stock Market (FTSE Bursa Malaysia KLCI)

Bursa Malaysia is the only stock market in Malaysia, it contained total 909 companies (as at 3-Mar-2014) listed on it where 800 companies listed in main market whereas 109 companies listed in ACE market, there are total 14 sectors in Bursa Malaysia such as Construction, Consumer Products, Closed End Funds, Finances, Hotels, Industrial Products, IPC, Mining, Plantations, Properties, REITs, SPAC, Technology, Trading/Services. Malaysia stock market index is represented by FTSE Bursa Malaysia KLCI, previously it was known as Kuala Lumpur Composite Index (KLCI) and was only transitioned to the FTSE Bursa Malaysia KLCI at year 2009. It is the benchmark for the performance of Malaysia stock market as well as the benchmark for Malaysia economic indirectly. FTSE Bursa Malaysia KLCI index gives investor a general idea about the market overview in Malaysia as well as the country economic health. FTSE Bursa Malaysia KLCI index contains the selected 30 largest companies from main board which listed in Bursa Malaysia. In order for the companies listed in Bursa Malaysia, they must fulfill the two main eligibility requirement stated in FTSE Bursa Malaysia Ground Rules, it is free float and liquidity. A minimum of free float allowance is 15% for each of the company and the liquidity is to ensure that the share market is liquid enough to be traded.

2.3 Local Macroeconomic Variables

2.3.1 Money Supply

Money supply is the entire amount monetary assets and other liquid instrument available in a country's economic at a specific time. We can obtain the monthly money supply data easily from central bank of the country since it is published. Since money supply is the measurement of the monetary assets in a country, it plays an important role in influencing the economics of a country. Public sector and private sector analysts always pay attention to the changes in money supply because it can eventually affects the inflation rate, exchange rate and interest rate of a country. A decrease in cost of borrowing will bring to increase in leverage and cause in price surge, an increase in M2 growth shows that an excess liquidity available for buying securities, this result the security price to increase (Mirza & Hashem, 2013)Money supply has become a favorable macroeconomic variable used in the previous studies, most of the previous studies found that money supply is significantly in influencing the stock market of a country either positively or negatively (Aisyah, Noor & Fauziah, 2009; Zukarnain & Sofian, 2012; R. Ratneswary, 2010; Seyed, Zamri & Lai, 2011; Rosylin, Shabri & Ahmad, 2006; Mizra & Harshem, 2013; Shabri & Rosylin, 2009). Money supply can divided into 4 categories, M0, M1, M2 and M3 because of its different types of money. M0 is the narrowest in the money supply and only include with the

most liquid assets such as currency, whereas M3 is the broadest in the money supply and only include with the less liquid types of assets such as certificates of deposit. Even the money supply significant influence the stock market, Mohamed et. al. (2009) and Mohd et. al. (2012) found that M2 and M3 which are the broad money supply have negative relationship with FTSE Bursa Malaysia KLCI and Kuala Lumpur Syariah Index. In Mirza & Hashem (2013) research, they provide information that similar with Mohd et. al. (2012) where the relationship between Malaysia Islamic stock and money supply are existing, but Mirza & Hashem (2013) found that the relationship between these can be in different direction, they found that FTSE Bursa Malaysia Hijrah Shariah Index is leading the money supply positively.

Not only the broadest measurement M2 and M3 are significantly influencing the country stock market, the narrow measurement M1 also been found that can significantly influencing the Malaysia stock market (Ratneswary, 2010) and have co-integration relationship with Singapore stock market (Rajen & Qiao, 1997) and have co-integration relationship with Korean stock market as well but Korean stock market cannot be used as a leading indicator for money supply (Chong & Tai, 1999). This shows that money supply not only can influence the Malaysia stock market, but it can influence other country stock market in ASEAN country such as Korean and Singapore. It has the strong evidence claim that money supply plays an important role in affecting Malaysia stock market. Most of the previous studies which investigate the relationship between Malaysia stock market and money supply have proved that there is significant relationship (Aisyah, Noor & Fauziah, 2009; Zukarnain & Sofian, 2012; Ratneswary, 2010; Rosylin, Sharbri & Ahmad, 2006; Mohamed et. al., 2009; Md. Mahmudul & Md. Gazi, 2009; Propha & Subhash, 2002), it can affect the Malaysia stock market either in positive direction or negative direction. The money supply in Malaysia not only can affect the Malaysia stock market, but can affect the Malaysia Islamic stock market as well, it have been proven that the money supply is significantly affecingt the Syariah market as well (Mirza & Hashem, 2013; Mohd. Yahya et. al., 2012; Shari & Rosylin, 2009).

2.3.2 Exchange Rate

Currency exchange rate is the rate for whose need exchange foreign currency by using his local currency, the currency rate could be change at a moment notice in currency market where the currencies are freely floating, foreigner will refer to this currency rate when they need to travel to other country, whereas all MNC companies also give a lot attention to the currency rate movement because this can indirectly affect their profitability when they transfer the money out from one country. Some of the countries will use pegged system where their local currency is pegged to other, so the rate will be fixed all the time, this will benefit to the MNC companies but the country economic hardly to grow is using pegged system. Meanwhile some other currencies are controlled in a managed float strategy whereby their local central bank can intervene its country currency is there is necessity. Between year 1995 and 1997, Malaysia was using a free floating system for the currency and was traded at around 2.5 to US Dollar, but during the economic crisis in 1998, Malaysia has changed currency strategy to become pegged system, Ringgit was pegged to US Dollar from year 1998 until 2005, Malaysia ringgit was traded at 3.80 to US Dollar, Malaysia has remain this strategy for almost 7 years until 2005, then changed to managed float system until today.

Exchange rate is one of the important macroeconomic variables that play a vital role in a country economic health, it can affect the rate of local currency to foreign currency, this is the reason why Malaysia government keeps on changing the currency system to maintain the country economic health. The exchange rate can influence the export activities and import activities directly and eventually will influence the country GDP. A higher currency will make the country goods more expensive and reduce the demand whereas a lower currency will make the country goods cheaper and increase the demand, therefore it will directly affect the profit of a company in Malaysia which doing international business.There were many previous studies using exchange rate as one of the macroeconomic variable. Investigation of previous studies reveal that the relationship between exchange rate with country stock market, mostly of the researchers using US Dollar as the base currency toward their local currency such as Aisyah, Noor & Fauziah (2009), Zukarnain & Sofian (2012), Liu & Wan (2012), Ratneswary (2010), Caroline et. Al. (2011), Chong & Tai (1999), Rajen & Qiao (1997), David (2002), Anthony & Kwame (2008), Osamah (1999), Shabri & Rosylin (2006), etc. This is proven that many researchers believe that exchange rate plays a very important role in their country economic and many of them using US Dollar as base because US Dollar is worldwide common used currency.

Based on the finding from the previous studies, most of the empirical results show that exchange rate do play an important role in affecting the country stock market either in positive or negative direction, the results of 15 studies out of 25 studies are statistically significant and this shows that the exchange rate has a relationship with the country stock market but according to Seema & Paresh (2012) and Prapha & Subhash (2002), exchange rate is not significant influence to all countries, it is depend on certain countries only. But based on Rajen & Qiao (1997) result, they cannot found any significant evidence to prove that the relationship existence between the USD/SGD and the Singapore stock market, but this study was using the data from year 1984 until 1993 and there is no further update for this study, so the future research regarding the relationship between USD/SGD and Singapore stock market need to be verify again.

There are few studies show that there is no relationship between exchange rate and stock market (Zukarnian & Sofian, 2012 and Rajen & Qiao, 1997). Zukarnian & Soafian (2012) shows that there is no relationship exist in Malaysia stock

market whereas mostly of the studies proved that there is significant relationship between exchange rate and Malaysia stock market. In the study of Rajen & Qiao (1997), they show that there is no significant relationship between exchange rate in Singapore and Singapore stock market, but there is significant relationship exists in Korean stock market (Chong & Tai, 1999) and China stock market (Liu & Wan, 2012). In these two researches, they have proved that the relationship does exist between the local currency exchange rate and the local stock market in other ASIA countries except Singapore, there is a unidirectional causality relationship from exchange rate to China stock index (Liu & Wan, 2012), meanwhile according to Chong & Tai (1999), they have proved that the Korean stock market is not a leading indicator for exchange rate. Whereas in the studies of Shiu-sheng (2009), Benjamin (2008) and Abdullah, Sarkar & Omar (2012), they proved that there is no significant relationship between exchange rate and stock market in US, Bangladesh, Chile and Mexico.

Since exchange rate plays an important role in country economic health, this study also adopt exchange rate as one of the macroeconomic variable. There is difference between the exchange rate used in this study with other studies, this is because the exchange rate use in this study is Malaysia Ringgit versus Singapore Dollar (MYR/SGD) instead of using US Dollar as base. The reason of using Singapore Dollar instead of US Dollar is because Singapore is just beside Malaysia and there are a lot of Singaporeans travel to Malaysia every year, and recently the Malaysia Ringgit has depreciated to a lowest low toward the Singapore Dollar for the past few years, this has increase the spending power of the Singaporean and eventually will affect the country income, so it has increase a lot investors curiosity whether this currency movement can be used to forecast the share market, the relationship between the SGD/MYR with Malaysia stock market will be further study in this research.

2.3.3 Inflation Rate

Another macroeconomic that plays an important role in affecting the country economic health is inflation rate. Inflation is the persistent increase in the price level either in goods or services over a certain period of time. When the price level increase, fewer goods and services we can buy with the same currency compare to the usual price level, in other word the purchasing power of residents will reduce. For example, last time the goods cost RM1,000, but if the inflation rate of last year was about 5%, so we need to have RM1,050 in order to purchase the same goods, this will reduce the purchasing power of the resident, residents will choose not to buy it if it is not a necessity goods. Increase in inflation rate will give two ways impacts on the country economic, either positive or negative impact to the country economic but usually the negative impact will be greater compare to positive impact for the long run. The negative impact of the inflation rate is that there will be increase in the opportunity cost of holding money, so this will eventually discourage investment and saving in the bank because the earning will less than the opportunity cost. Meanwhile the positive impact of the inflation rate is the central banks of the country will adjust the real interest rate in accordingly to the inflation rate and will encouraging investment in non-monetary capital projects but in the same time the borrowing rate will be adjusted according the interest rate, eventually this will reduce the company to borrow money for expansion their business.

There were a lot previous studies using inflation rate as one of their independent variable in their research towards Malaysia stock market (Zukarnian & Sofian, 2012; Ratneswary, 2010; Caroline et. Al., 2011; Mirza & Hashem, 2013; Mohamed et. al., 1009; Mohd Yahya et. Al., 2012). Among these studies, there are two studies investigate the relationship between inflation rate and Malaysia Islamic Stock Index (Mirza & Hashem, 2013 and Mohd Yahya et. Al., 2012), but both of these studies have different conclusion regarding the significantly relationship between inflation rate and Malaysia Islamic Stock Index. In the study of Mohd et. Al. (2012), they found that there is a positive relationship between inflation rate and Malaysia Islamic Stock Index, but the results in the study of Mirza & Hashem (2013) is opposite to it, they have proved that the inflation rate is statistically insignificant to the Malaysia Islamic Stock Index, this is against the theory of mostly studies. The explanation given by Mirza & Hashem (2013) for this situation is because the inflation usually does not belong to the long run. The differences conclusion between Mirza & Hashem (2013) and Mohd et. Al. (2012) may because of the period of data collection, the data period used by Mirza & Hashem (2013) was from 2006 until 2012, but the data period used by Mohd et. Al. (2012) was from 1999 until 2007. Since the data for these two studies was collected at different period, so we can assume that previously there was significant relationship between inflation rate and Malaysia Islamic Stock Index, but there is no significant relationship between inflation rate and Malaysia Islamic Stock Index for the recently years.

Among all the previous studies which using inflation as one of the independent variable, mostly concluded that the inflation rate does significantly influence the stock market. This is not only appled to Malaysia stock market, other countries such as China and US country have the same results that the relationship between inflation and the local stock market is significant (Caroline et. Al., 2011; Shiu-Sheng, 2009;). Besides that, the Indian stock market also significantly influence by their local inflation rate (Syed, Zamri & Lai, 2011), this is the strong evidence claims that there is a relationship between the inflation rate and stock market. Even though in the study of David (2002), he shows that there is no significant relationship between inflation rate and UK stock market, it is same happened to Ghana stock market where Khaled & Le (2009) has proved that there is insignificant relationship between them. Although these 2 studies shows that there is no relationship between them, but it is undeniable that inflation rate plays an important role in influencing the

country growth as well as the economic, so further study need to be conduct by using the latest data to verify again the results

2.3.4 Interest Rate

Interest rate is refers to a specified amount of paid by the bank on the use of these cash deposit over a period of time to the depositors, it is usually known as bank deposit rate. Interest in another side can be refers as the amount of money of a borrower will pay to the bank for the use of the money borrowed over a period of time, it is usually known as base lending rate (BLR). The interest rate can be used to represent a country economic health because as mentioned in previous section, the inflation rate will eventually influence the interest rate and the inflation rate did plays an important roles in affecting a country economic, thus the interest rate indirectly did the same roles as inflation rate.

Because of this reason, many researchers targeting interest rate as one of their investigation target. There were 14 out of 25 researchers from the previous studies investigated the relationship between interest rate and different stock market. There were 9 studies proved that there was significant influence from the interest rate towards the country stock market (Aisyah, Noor & Fauziah, 2009; Caroline et. al., 2011; Mirza & Hashem, 2013; Md Mahmudul & Md Gazi, 2009; Seema & Paresh, 2012; Prapha & Subhash, 2002; Anthony & Kwame, 2008; Khaled & Le, 2009; M. Shabri & Rosylin, 2009).

There are usually 4 types of interest rate which adopted by the previous researchers in their studies, they are Base Lending Rate which used by Zukarnain & Sofian (2012), KLIBOR which used by Mirza & Hashem (2013), Bank Deposit Rate which used by Md Mahmudul & Md Gazi (2009), the fourth type is Treasury Bill Rate (T-bill) which common used in the studies of Caroline et. al. (2011), Praphan & Subhash (2012) and Anthony & Kawme (2008). Bank deposit rate is the rate which paid by the bank to the depositor whereas base lending rate is the rate which paid by the borrower to the bank. Treasury bill is the bond which issued by the government and constantly coupon payment which can be consider as risk free bond or safe bond because the interest rate is paid by the government constantly. KLIBOR (Kuala Lumpur Interbank Offered Rate) is the fundamental interest basis used by bank for borrowing or lending money to each other, KLIBOR generally moves closely with Malaysia overnight policy rate.

The studies using BLR (Zukarnain & Sofian, 2012), KLIBOR (Mirza & Hashem, 2013), bank deposit rate (Md Mahmudul & Md Gazi, 2009) and T-bill (Caroline et. al., 2011; Praphan & Subhash, 2012 and Anthony & Kawme, 2008) shows that the interest rate is significantly can affect the stock market, but according to Zukarnain & Sofian (2012), even though the BLR can granger causality to Malaysia stock market, but the Malaysia stock market cannot be granger causality to BLR.

The interest rate not only can influence Malaysia as well as other countries, Anthony & Kwame, 2008 and Khaled & Le, 2009 have mentioned that the local interest rate plays an important role in affecting the Ghana and Vietnam stock market. Interest rate plays an important role in affecting Europe countries as well such as Australia, Canada, Chile, Italy, Mexico, and Spain, this has been proven in the study of Md Mahmudul & Md Gazi, 2009. Even though there were studies proved that the significant relationship occurs between interest rate and stock market in their studies, but some researchers proved that there is no linkage between interest rate and stock market.

Although previously had mentioned that the high inflation will eventually increase the interest rate of a country because interest rate reflect the market information regarding expected change in the purchasing power of money or future inflation rate (Osamah, 2009), but there is one study proved that it is not necessary a relationship must have between inflation of a country with the country interest rate. According to Osamah (1999), she target on the inflation rate in the nine countries in the Pacific Basin. Pacific Basin is refers to the Pacific Ocean from the Arctic in the north to the Southern Ocean to Asia and Australia in the west and Americas in the east. Her study included with the countries of Australia, Hong Kong, Indonesia, South Korea, Malaysia, Philippines, Singapore and Thailand, her study unable to find a unidirectional causality between inflation rate and interest rates, it also fails to find either a consistent positive response of inflation to the shocks in interest rate in her targeting countries (Osamah, 1999) and the results are same from the methodology of vector autoregressive (VAR) as well as co-integration test, so it means that there is no significant relationship between inflation rate and the interest rate which mostly peoples have assumed there is relationship between them because normally the high inflation in the country will eventually lead to increase in the interest rate.

2.3.5 Industrial Production Index

IPI is a monthly index that measures the output of the industrial sector of the economy mainly in 3 sectors which are manufacturing, mining and electric & gas utilities. It is slightly different with Gross Domestic Production (GDP) because GDP is a quarterly release data that measures the market value of the goods and services which produced by labor and property located in a country, although these sectors in the IPI contribute only a small portion of GDP, but they are highly sensitive to interest rates and consumer demand, this cause the IPI become an important forecasting tool to predict the country economic performance.

Review of the literature indicated that many researchers are interesting in the relationship between these 2 variables (Aisyah, Noor & Fauziah, 2009; Zukarnain & Sofian, 2012; Ratneswary, 2010; Seyed, Zamri & Lai, 2011; Caroline et.

al., 2011; Rosylin, Shabri & Ahmad, 2006;Mohd Yahya et. al., 2012; Chong & Tai, 1999; Praphan & Subhash, 2002; Hussain & Ali, 2013; David, 2002; Shiu-Sheng, 2009; Benjamin, 2008; Khaled & Le, 2009 and M. Shabri & Rosylin, 2009).

These previous studies had proven that the significant relationship not only happened in Malaysia, but also at other ASEAN countries and Europe countries. According to Caroline et. al., 2011, they have shown that IPI is significantly play a significant and important role in affecting the stock market in Malaysia, China as well as US stock market. Meanwhile some other researchers have reveleal that there is relationship between IPI and stock market in Vietnam (Khaled & Le, 2009), Jordon (Hussain & Ali, 2013), Korean (Chong & Tai, 1999), Singapore, Thailand, Philippines, Indonesia (Prapha & Suhbash, 2002). Whereas in Malaysia, there were about 5 studies shows that there was significant relationship between IPI and Malaysia stock market (Aisyah, Noor & Fauziah, 2009; R. Ratneswary, 2010; Caroline et. al., 2011; Rosylin, M. Shabri & Ahmad, 2006; Prapha & Subhash, 2002), some researchers using GDP and some using IPI, but both macroeconomic variables did play an important roles in affecting the Malaysia stock market.

2.4 Foreign Macroeconomic Variables

2.4.1 Gold Price

The investigation for the relationship between the gold and Malaysia stock market is remain in very fresh status, seldom researchers will adopt gold price in their research paper. But as known worldwide, gold is a leading economic indicator the fluctuation of the gold price will represent economic of a country. Most of the countries in the world will purchase US Dollar as their country reserve currency because US Dollar is the common currency can be used in any country, but it has an inverse relationship with the gold price. Peoples will start to purchase gold when the US Dollar weaken, this will cause the gold price to be increase, but when the US Dollar is strong, peoples will tend to switch from gold to US Dollar and Malaysia Ringgit is strong influenced by US Dollar, so the gold price movement will indirectly influence the Malaysia economic.

Besides that, gold is considered as one of the hedging tool to hedge against the inflation. When the inflation rate increase, the purchasing power of the peoples will reduce, it means that it take more money to buy a same product compared to the past, so the investor will shift their money to gold and this will cause the gold price to increase.

2.4.2 Dow Jones Industrial Average Index

Dow Jones index is the oldest stock market index in US market, it is the measurement of combined stock values of 30 big US companies, it consists of different stocks in various sectors and this give us a general snapshot of the stock market, this include with housing sector, energy sector, technology sector and consumer sector.. Dow Jones Industrial Average has been existed for more than 100 years., S&P Dow Jones Indices LLC is a subsidiary of The McGraw-Hill Companies and is the world largest, global resource for index-based data and research.This is the only foreign macroeconomic variable using in this study, as mentioned early, Malaysia stock market is being influence by US market, so this study is to verify again this statement. The reason why Dow Jones can influence our stock market is because previously our currency Ringgit is pegged to US Dollar until recent year.

3.1 Research Methodologist

There were total fours variables which included with three independent variables and one dependent variable being used in this study. These data are collected from January 2000 to December 2013 using monthly data, the period of this study is 14 years. There are total 1008 observations used in this study, out of total 1008 observations, there are 168 observations for each variable. Monthly data is adopted in study instead of quarterly data is to increase the accuracy of the finding as well as to avoid the problem of thin trading and price limits of a stock market. All variables are obtained only from one source.

3.2 Research Design

This study is for financial research purposes and using secondary source of data, so this paper is a quantitative research which includes with a series of empirical technique and formulae. All the data are obtained from same source, this is to avoid any differences if using different source. A program will be used in this study to investigate the relationship between macroeconomic variables and Malaysia stock market, the program is E-views software. It is statistical analysis software which has been adopted by other researcher before.

3.3 Data Collection Method

This study is focusing on secondary data, there are a plenty of sources which allow us to obtain secondary. In order to avoid the discrepancy of the data, so all the data will be only obtained from one source which is DataStream.

3.3.1 Source of Data

The reason of using secondary data is because of its high reliability which can increase the accuracy of the analysis. The data will cover from January 2000 to December 2013 for all the independent variables of Exchange Rate (MYR/SGD), Gold Bullion LBM (Gold price), Dow Jones Industrial Index (DJI), Inflation Rate (CPI), Interest Rate (BLR) and also for dependent variable of FTSE Bursa Malaysia KLCI, these data are extracted from DataStream database.

Table 3.3: Source of Data				
Variables	**Proxy**	**Explanation**	**Unit**	**Source of data**
Stock market	KLCI	FTSE Bursa Malaysia KLCI	Index	DataStream
Exchange rate	ER	MYR/SGD rate	RM	DataStream
Inflation rate	CPI	Consumer price index	Index	DataStream
Interest rate	BLR	Base lending rate	Index	DataStream
Gold Price	Gold	Gold bullion LBM	USD	DataStream
Dow Jones	DJI	Dow Jones Industrial	Index	DataStream

3.4 Sampling Design

3.4.1 Target Population

This study targets Malaysia stock market and intends to investigate the relationship between the identified independent variables and stock market in Malaysia which is considered one of the developing countries. Since there are 909 companies listed in Bursa Malaysia (as at 3-Mar-2014), in order to obtain a general performance of the stock market, not all the companies will be used, only FTSE Bursa Malaysia KLCI index is consider because it represents Malaysia stock market index in worldwide. FTSE Bursa Malaysia KLCI index comprises of top 30 companies listed on the main board by full market capitalization that meet the eligibility requirement of the FTSE Bursa Malaysia Ground Rules and the requirement stated in the FTSE Bursa Malaysia Ground Rules are the free float and liquidity. Besides that, it plays an important role in promoting Malaysia market globally through adoption of internationally accepted standard in 2011. This is the reason why this study only targeted FTSE Bursa Malaysia KLCI index instead of all the companies listed on the Bursa Malaysia.

3.4.2 Sampling Technique

In this study, E-View will be used as a tool for performing the analyzing of the finding. As mention in the previous section, E-view is software that provides statistic data analysis, estimation and forecasting program. It is the favorable tool used by mostly economist to perform statistical analysis.

Several empirical analyses would be carried out such as Co-integration tests, Unit Root test and Granger Causality test. Findings from the literature review revealed that, mostly of the studies were using these methods to investigate the relationship between these variables such as money supply, exchange rate, industrial production index, interest rate, inflation rate with stock market, so this justify the selection of same methodology to be adopted in this study .

3.4.3 Sampling Size

This study will using daily data from January 2000 to December 2013, the period is 14 years. The main reason of choosing this period is because this study intends to investigate Malaysia stock market behavior after the economic crisis occurred in Malaysia in year 1997 and using the latest data. There are 168 observations for each variable will be used in this research. All of these data are in monthly basis. For Malaysia stock market, FTSE Bursa Malaysia KLCI index will be used to represent Malaysia stock market. It consist 30 largest companies listed in Malaysia main board and is recognized internationally

3.5 Hypotheses of the Study

3.5.1 Local Macroeconomic Variables

Exchange Rate (ER)

H_0 : There is no relationship between the Malaysia stock return (KLCI) and exchange rate (ER)

H_1 : There is a relationship between the Malaysia stock return (KLCI) and exchange rate (ER)

Generally, it is believed that the exchange rate will affect the country stock market directly, it has been proven by previous studies. For example, according to Liu & Wan (2012), they show that there is a unidirectional causality relationship from the exchange rate to China stock index. The exchange rate of a country is believed will influence the country stock market to a certain extent, this is because exchange rate will directly influence the profit of an export and import company. For example, if a country currency too high, the goods demand for that country will reduce because foreigner needs to pay higher cost to purchase the same goods, this will eventually reduce the profit of the company in that country.

Inflation Rate (CPI)

H_0 **:** There is no relationship between the Malaysia stock return (KLCI) and inflation rate (CPI)

H_1 **:** There is a relationship between the Malaysia stock return (KLCI) and inflation rate (CPI)

Most of the previous studies mentioned that there the relationship between inflation rate and local stock market was existed. According to Prapha & Subhash (2002), they shows that the inflation rate can significantly influence the stock market in Malaysia, Singapore, Thailand, Philippines and Indonesia. This study intends to verify again the relationship between them by using the latest data.

Interest Rate (BLR)

H_0 : There is no relationship between the Malaysia stock return (KLCI) and interest rate (BLR)

H_1 : There is a relationship between the Malaysia stock return (KLCI) and interest rate (BLR)

Base lending rate is the minimum interest rate that the borrowers need to pay for their loan. It is calculated based by banking institution and taken into account the institutional cost and other administrative cost based on a formulae. BLR has been adopted in the study of Zukarnain & Sofian (2012) and shows that the relationship was existed between BLR and stock market. This study intends to verify again this relationship by using the latest data and different methodology.

**3.5.2 Foreign Macroeconomic Variables**

Gold Bullion LBM (Gold)

H_0 **:** There is no relationship between the Malaysia stock market and gold bullion LBM price (Gold)

H_1 **:** The is relationship between the Malaysia stock market and gold bullion LBM price (Gold)

It is seldom to see previous researchers investigate the impact of gold price to the country stock market compare to other common macroeconomic variables such as CPI, GDP, interest rate and etc, but it is undeniable that gold is becoming more popular now as it is stable and the value is kept increasing because there are many countries not only purchase US currency as their reserve currency but they purchase the gold together as well. Thus, if the gold price reduces, this will directly reduce the amount of reserve of a country. Below is the gold price chart for period Jan 2000 until Jan 2014, it shown that the price of gold was continue to increase.

Figure 3.5.1: Gold Price from 2000 until Jan 2014
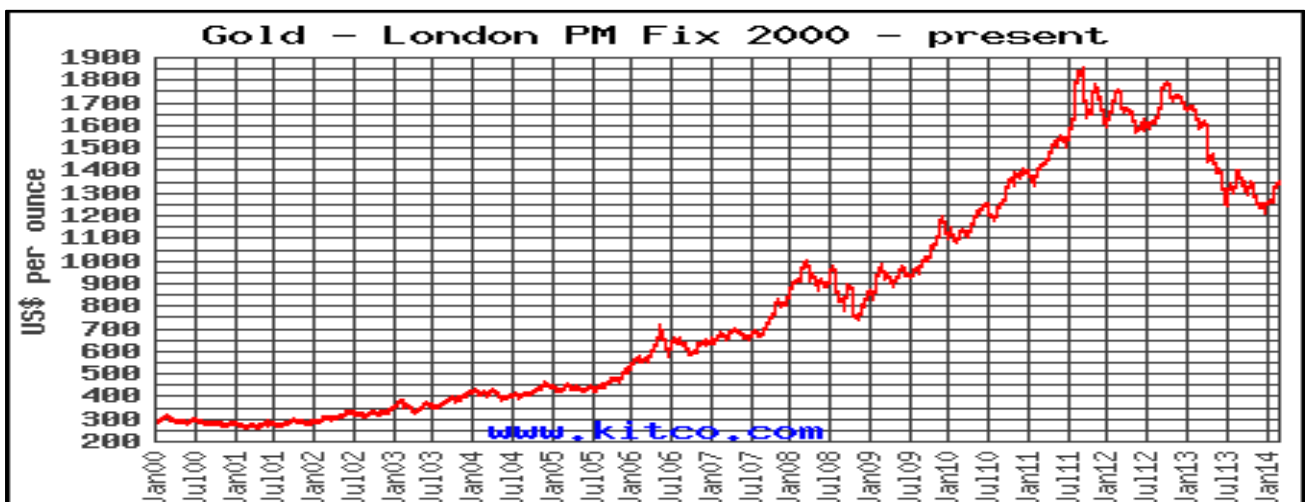

(Source: www.kitco.com)

Dow Jones Industrial Average (DJI)

H_0 = There is no relationship between the Malaysia stock market and Dow Jones Industrial Average (DJI)

H_1 = There is relationship between the Malaysia stock market and Dow Jones Industrial Average (DJI)

S&P Dow Jones is the largest stock market in US country, it has been existed for more than 100 years. In Malaysia, US Dollar is still widely used in business trading, transaction, the most popular foreign currency used in Malaysia business world still US Dollar, so the US economic is believed will directly influence to other country which export goods to US or import goods from US. So it is believed it will have positive influence to Malaysia stock market as well. Below is the graph shows that percentage of global currency reserves held in the particular currency, we can see that US Dollar remain the top currency reserve worldwide.

Figure 3.5.2: Percentage of Global Currency Reserves
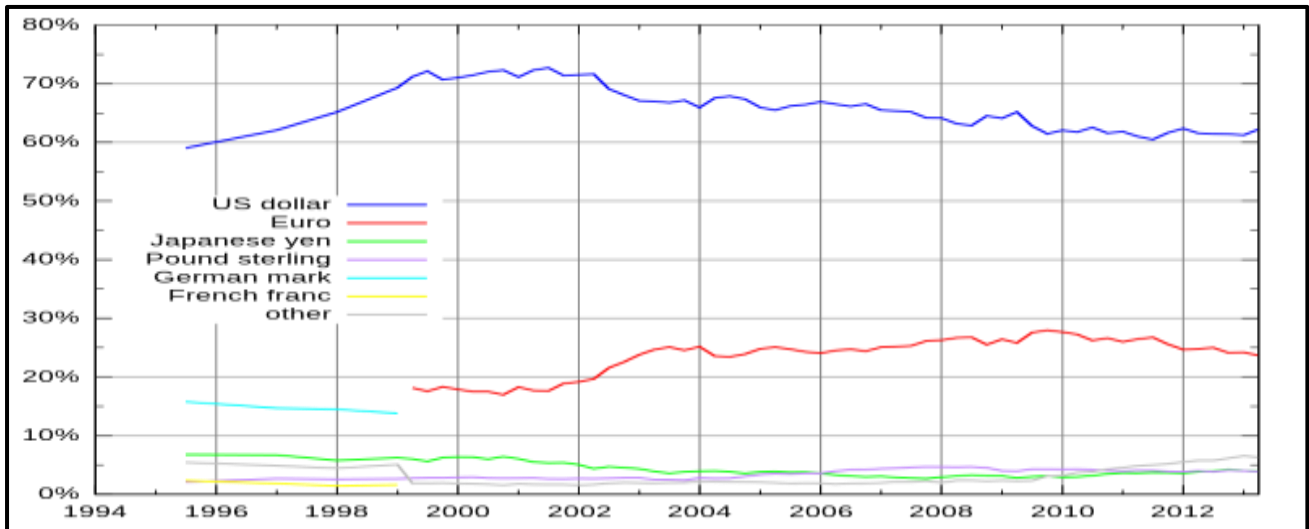
(Source : www.wikipedia.org)

3.6 Data Processing

Figure 3.6: Data Processing
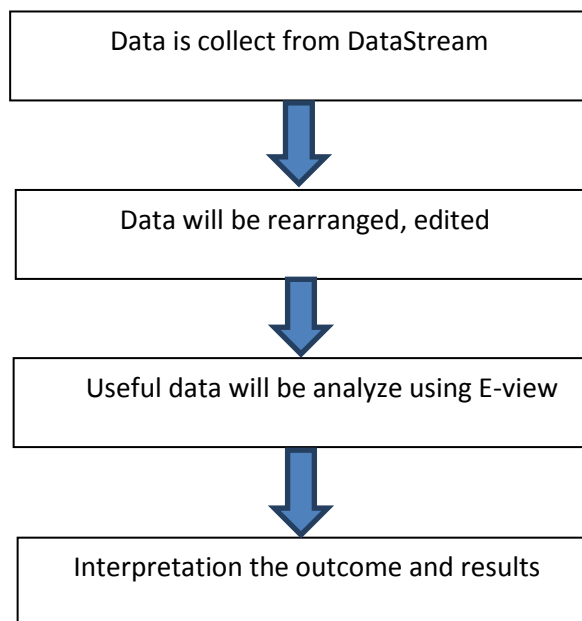
Above figure shows how these data being process. Firstly, the data from DataStream will be obtained. Then these data will be edited, re-arranged. After that these data will be analyze by using a software program which is known as E-views. Lastly, the finding and results will be interpreted.

3.7 Multi Regression Model

Before starting the analysis, all the variables must be converting into natural logarithm format, this is mainly because all these data are calculated in monthly basis, by converting into logarithm format, it will reduce the gap of the data between variable, so the spread differences between each variable can be reduce.

Normal Function

KLCI= f (Exchange Rate, Inflation Rate, Interest Rate, Gold Bullion LBM price, Dow Jones Index)

Logarithm Model

$$\text{Log } KLCI_t = \beta_0 + \beta_1 Log ER_t + \beta_2 Log CPI_t + \beta_3 Log BLR_t + \beta_4 Log Gold_t + \beta_5 Log DJI_t + \varepsilon_t$$

N = 168 observation

Where,

Log$KLCI$ = Natural logarithm of Malaysia stock market at t year

LogER = Natural logarithm of exchange rate at t year

LogCPI = Natural logarithm of inflation rate at t year

LogBLR = Natural logarithm of interest rate at t year

Log$Gold$ = Natural logarithm of Gold Bullion LBM price at t year

LogDJI = Natural logarithm of Dow Jones Index at t year

ε = Residual

3.8 Data Analysis

There are 3 tests to be conducted in order to investigate the relationship between these variables. These 3 tests are such as unit root test, Johansen & Juselius co-integration test and granger causality test, each of them is testing in different perspective.

3.8.1 Unit Root Test

Unit root test is to tests whether a time series variable is non stationary using an autoregressive model and aimed at establishing the order of integration of each variable. Before go in to other testing, unit root test must be performed to test the stationarity of those variables in this study, this is a very important initial stage. The stationarity of a series can strongly influence its behavior and properties, if the variables are not stationary, then it can be proved that the standard assumptions for asymptotic analysis will not be valid. Besides that, if the variables are not stationary, it might lead to spurious regression, according to Seyed, Zamri & Lai (2011), if a model consists of non-stationary variables, the usual test statistic either T test of F test would not have the standard distribution. Thus, the unit root test will be conducted prior to test its stationarity and to determine the order of integration, there are 2 types of unit root tests will be conducted in this study.

The first type of unit root test using in this paper is Augmented Dickey Fuller (ADF) test. This is a well know test that can be used in large sample and more complicated se t of time series models. We will obtain negative number by performing this test, the more negative the number, it is stronger the rejection of the hypothesis that there is a unit root at some level of confidence. Besides, it is also investigating on the coefficient of the regression. The formula for ADF is as below:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \cdots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t,$$

Where,

t is the time trend

y_{t-1} is the variable in period t

Δ is the difference operator

ε_t is an error term disturbance with mean zero and variance

The second type of unit root test is Phillips-Perron (PP) test, which is used to test the null hypothesis that a time series is integrated of order 1. PP test use non parametric statistical methods and avoid the use of adding lagged difference terms as in ADF test (Mohamed et. al., 2009; Mohd Yahya et. al., 2012; Praphan & Subhash, 2002)., below equation represent for PP test

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + \varepsilon_t$$

3.8.2 Johansen Co-integration Test

After determine the order of the integration for each variable, then will continue to test co-integration relationship among these variables. According to Mohamed et. al. (2009), there is various models in order to test the co-integration relationship among the variables such as Engle-Granger procedure, dynamic ordinary least squares, Johansen & Juselius procedure and Bounds Test.

Johansen test will be adopted in this study to perform the co-integration test. The Johansen & Juselius test is to determine whether the linear combination of the series have a long run equilibrium relationship or not, if there is co-integration relationship among these variables, a linear combination of the integrated series is stationary.

Basically there are 2 types of Johansen & Juselius test, namely trace test and max eigenvalue test. The formula for both test are as below:

$$\text{Trace} = -T \sum_{i-i+1}^{n} \ln(1 - \mu i)$$

For null hypothesis, the number of co-integration vectors is less than or equal to r, which r=0,1,2,… the alternative hypothesis against this is that r=n

$$\text{Max Eigen} = -T \ln (1 - \mu_r)$$

The null hypothesis is that the existence of r co-integration vector and the alternative hypotheses is r+1 co-integration vector.

3.8.3 Granger Causality Tests

After the Johansen & Juselius test, this study will investigate the causal relations between Malaysia stock market index and macroeconomic variables which mentioned early by using Granger Causality test which proposed by Granger (1969) and these variables might be used predict each other if the causal relationship existed. Granger causality technique is to further determine the relationship between independent and dependent variables, it is used to test whether independent variables can be used to forecast dependent variable and vice versa. Sometime the relationship occurs in one direction and vice versa whereas sometime it could happen in both ways. Granger causality technique being adopted in this study is tends provide the information whether which variable can granger cause another.

There are 2 steps in the Granger Causality testing. Firstly, stationary data is needed rather than non-stationary data, afterward, granger methodology which is sensitive to the lag length is used to test the stationary property of the data (Chong & Tai, 1999). Granger Causality test is normally test in the context of linear regression models, the magnitude of a Granger causality interaction can be estimated by using F-statistic (Geweke 1982). The basic illustration for Granger Causality test is as below:

$$X_1(t) = \sum_{j=1}^{P} A11, jX1(t-j) + \sum_{j=1}^{P} A12, jX2(t-j) + E_1(t)$$

$$X_2(t) = \sum_{j=1}^{P} A21, jX1(t-j) + \sum_{j=1}^{P} A22, jX2(t-j) + E_2(t)$$

Where,

P is the maximum number of lagged observations

Matrix A contains the coefficients of the model

E_1 and E_2 are residuals

In order the causality effect to be happen, the variance of E_1/E_2 must reduced by the inclusion of the X_2/X_1 terms in the first/second equation, so in this situation, we can say that X_2/X_1 is Granger Cause X_1/X_2 (Ding et. al., 2006)

If stock market can granger cause macroeconomic variable, so it will be very useful to policy maker in order to forecast the macroeconomic. If macroeconomic variable can granger cause stock market, so it will be very useful to investor in order to seek for higher return in their investment portfolio (Zukarnain & Sofian, 2012).

3.9 Conclusion

In this study, there are total 3 macroeconomic variables which include ER as proxy for Exchange Rate (MYR/SGD), Gold as proxy for Gold Bullion LBM price, DJI as proxy for Dow Jones Industrial Index (DJI) and also for dependent variable of FTSE Bursa Malaysia KLCI index as a proxy for Malaysia stock market. There are a set of 168 observations for each variable for 14 years period, from January 2000 until December 2013. All these data will be obtained from same source to avoid difference. The methodologies used in this study are unit root test, follow by Johansen co-integration test and then granger causality test in testing the relationship between these variables.

4.1 Data Finding and Results

There are several different methodologies will be used in this chapter investigate the relationship between the macroeconomic variables and Malaysia stock market, even though different methodologies will be used in this paper but all these methodologies are used to investigate the relationship between this variables in different dimension. There are total 3 methodologies will be used in this paper such as Unit Root Test, Johansen & Juselius Co-integration Test and Granger Causality Test as mentioned in previous chapter, this chapter will present all the empirical results from the finding.

4.2 Normality Test

Normality test is important for most statistical test, if it is deviate from normality, it will show inaccurate results for the rest of the testing.

4.2.1 Hypothesis

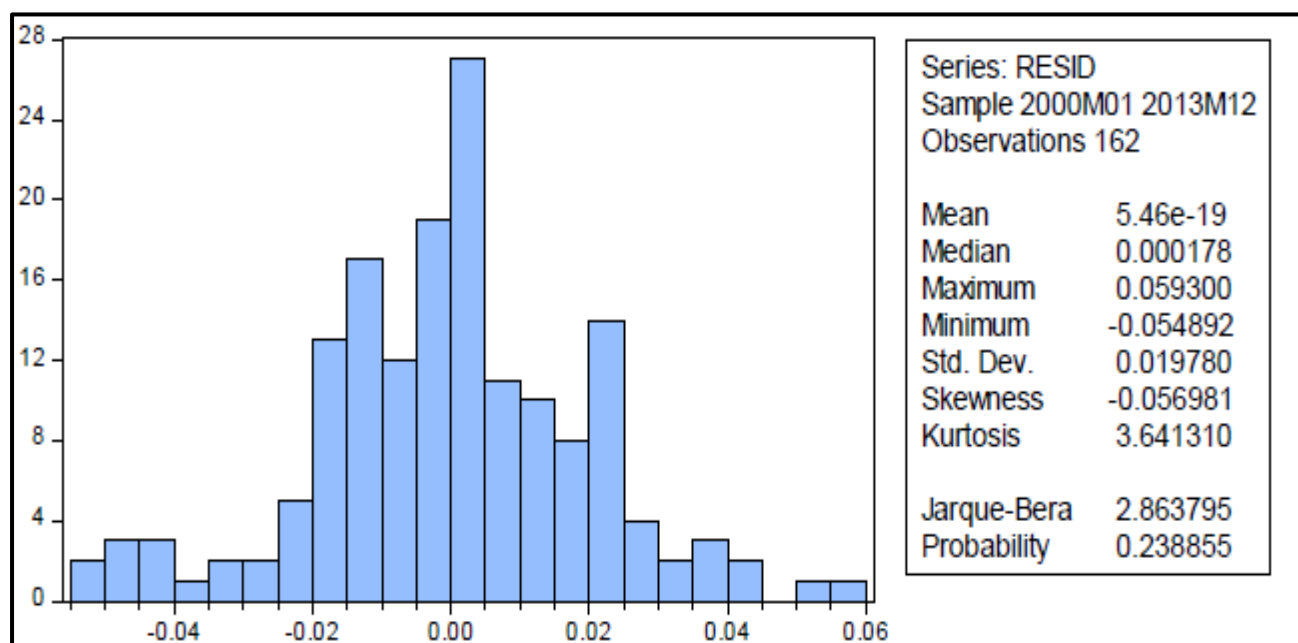H_0: Error term is normally distributed.

H_1: Error term is not normally distributed.

4.2.2 Decision Rules

   i)   Do not reject H_0 if P-value for Jarque-Bera is > 0.01, meaning the error term is normally distributed.

   ii)   Reject H_0 if P-value for Jarque-Bera is < 0.01, meaning the error term is not normally distributed (Brooks, 2008)

4.2.3 Results

Figure 4.2: Jarque-Bera Normality Test

The P-value for Jarque-Bera is 0.238855, it is > 0.01, so do not reject H_0. Thus this shows that the error term is normally distributed and can continue to perform other tests on these data because it has been proven that the residual is in normality distributed.

4.3 Unit Root Test

The first step in this study is unit root test, this is used to obtain the significant model and stationary relationship between these variables, it is important for researchers to test the degree of stationarity of these variables before continue to next test. This study has employed Augmented Dickey-Fuller and Phillips-Perron to test for stationary for each variable. The results are shows in Table 4.3(a) and Table 4.3(b) respectively.

4.3.1 Hypothesis

H_0: LogKLCI/ LogER/ LogGold/ LogDJI/ LogCPI/ LogBLR is not stationary and has a unit root.

H_1: LogKLCI/ LogER/ LogGold/ LogDJI/ LogCPI/ LogBLR is stationary and does not contain unit root.

4.3.2 Decision Rules

1. Do not reject H_0 if t-statistic value is > critical value, meaning that it is not stationary and contain root.

2. Reject H_0 if t-statistic value is < critical value, meaning that it is stationary and does not contain root.

4.3.3 Result

Table 4.3(A): Unit Root Test Results for Local Macroeconomic Variables				
Variables	**Level**		**First Difference**	
	ADF	**PP**	**ADF**	**PP**
LogKLCI	0.9532	0.9121	0.0000***	0.0000***
	(-0.034854)	(-0.358373)	(-11.32939)	(-11.41709)
LogER	0.8933	0.9438	0.0000***	0.0000***
	(-0.466948)	(-0.124739)	(-11.95650)	(-12.21429)
LogCPI	0.9723	0.9801	0.0000***	0.0000***
	(0.205660)	(0.346622)	(-9.039301)	(-9.039301)
LogBLR	0.0924*	0.1770	0.0000***	0.0000***
	(-2.612961)	(-2.288107)	(-6.025755)	(-10.07256)

Value based on MacKinnon (1996) one-sided p-values.

The value in parenthesis refers to t-statistic.

***, ** and * indicate significant at 1%, 5% and 10% respectively

Table 4.3(B): Unit Root Test Results for Foreign Macroeconomic Variables				
Variables	**Level**		**First Difference**	
	ADF	**PP**	**ADF**	**PP**
LogDJI	0.8207	0.7172	0.0000***	0.0000***
	(-0.783809)	(-1.095553)	(-12.09507)	(-12.13273)
LogGold	0.7858	0.7881	0.0000***	0.0000***
	(-0.901757)	(-0.894528)	(-14.58257)	(-14.58257)

Value based on MacKinnon (1996) one-sided p-values.

The value in parenthesis refers to t-statistic.

***, ** and * indicate significant at 1%, 5% and 10% respectively

Based on the above tables, when there is no difference for the variables, all the variables are not significant, therefore we cannot reject H_0 and they are not stationary and contain unit root in both ADF test and PP test. However, when proceed to first difference, all the variables are significant at 1% and therefore can reject H_0 and can conclude that all the variables are stationary and do not contain root.

4.4 Johansen & Juselius Co-Integration Test

After established all these variables are stationary and have same order of integration, now continue to test the co-integration relationship between them. Johansen & Juselius (1990) Co-integration test is employed, it is used to determine whether the linear combination of the series possesses a long run equilibrium relationship. The samples are divided into 2 groups to test the co-integration relationship between local macroeconomic variables and Malaysia stock market as well as between foreign macroeconomic variables and Malaysia stock market. The results are show in Table 4.4.1(a), Table 4.4.1(b), Table 4.4.2(a) and Table 4.4.3(b).

4.4.1 Hypothesis

H_0: Co-integration relationship does not exists at number of co-integrating vector which is less than or equal to r.

H_1: Co-integration relationship does exists at a number of co-integrating vector which is more than r.

4.4.2 Decision Rules

i) Do not reject H_0 if Trace/ Max. eigen. value is < 5% critical value, meaning that there is no co-integration relationship.

ii) Reject H_0 if Trace/ Max. eigen. value is > 5% critical value, meaning that there is co-integration relationship exists.

4.4.3 Results

4.4.3.1 Co-Integration Test among KLCI and Foreign Macroeconomic Variables

Table 4.4.1(a): Trace Test				
Hypothesized		**Trace**	**0.05**	
No. of CE(s)	**Eigen. value**	**Statistic**	**Critical Value**	**Prob.***
None**	0.131152	32.73523	29.79707	0.0223
At most 1	0.050768	9.819582	15.49471	0.2949
At most 2	0.008108	1.327031	3.841466	0.2493
Trace test indicates 1 co-integrating equation at the 0.05 level				
**denotes rejection of the hypothesis at the 0.05 level				
*MacKinnon-Haug-Michelis (1999) p-values				

Table 4.4.1(b): Maximum Eigen. Value Test				
Hypothesized		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigen. value**	**Statistic**	**Critical Value**	**Prob.***
None **	0.131152	22.91565	21.13162	0.0278
At most 1	0.050768	8.492551	14.26460	0.3308
At most 2	0.008108	1.327031	3.841466	0.2493
Max eigen. value test indicates 1 co-integrating equation at the 0.05 level				
**denotes rejection of the hypothesis at the 0.05 level				
*MacKinnon-Haug-Michelis (1999) p-values				

4.4.3.2 Co-integration Test among KLCI and Local Macroeconomic Variables

Table 4.4.2(a): Trace Test				
Hypothesized		**Trace**	**0.05**	
No. of CE(s)	**Eigen. value**	**Statistic**	**Critical Value**	**Prob.***
None **	0.194129	59.85498	47.85613	0.0025
At most 1	0.090104	24.67435	29.79707	0.1734
At most 2	0.052021	9.283126	15.49471	0.3399
At most 3	0.003522	0.575169	3.841466	0.4482
Trace test indicates 1 co-integrating equation at the 0.05 level				
** denotes rejection of the hypothesis at the 0.05 level				
*MacKinnon-Haug-Michelis (1999) p-values				

Table 4.4.2(b): Maximum Eigen. Value Test				
Hypothesized		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigen. value**	**Statistic**	**Critical Value**	**Prob.***
None **	0.194129	35.18063	27.58434	0.0044
At most 1	0.090104	15.39123	21.13162	0.2624
At most 2	0.052021	8.707957	14.26460	0.3113
At most 3	0.003522	0.575169	3.841466	0.4482
Max eigen. value test indicates 1 co-integrating equation at the 0.05 level				
**denotes rejection of the hypothesis at the 0.05 level				
*MacKinnon-Haug-Michelis (1999) p-values				

From Table 4.4.1(a) and Table 4.4.1(b), the results show that trace test and maximum eigen. value test are co-integrated in r=0 at 5% significance level. Thus, H_0 is being rejected and this shows that there is long run relationship exists among Malaysia stock market and foreign macroeconomic variables. Meanwhile from Table 4.4.2(a) and Table 4.4.2(b), the results also show that trace test and maximum eigen. value are significance at 5% in r=0, meaning that the co-integration relationship does exists among the Malaysia stock market and local macroeconomic variables, there is at least 1 macroeconomic that can influence Malaysia stock market in long run. When consider long run relationship, the movement of these variables can influence the movement of the KLCI. It is consistent with the study from Ratneswary (2010) and Mohamed Asmy et. al. (2009) that exchange rate and inflation rate have a long run relationship with Malaysia stock market. Besides that, T-Bill used as a proxy for interest rate in the study of Rosylin, Shari & Ahmad (2006) also shows that there is long run relationship between interest rate and Malaysia stock market, it is similar to the BLR in this study which as a proxy for interest rate as well.
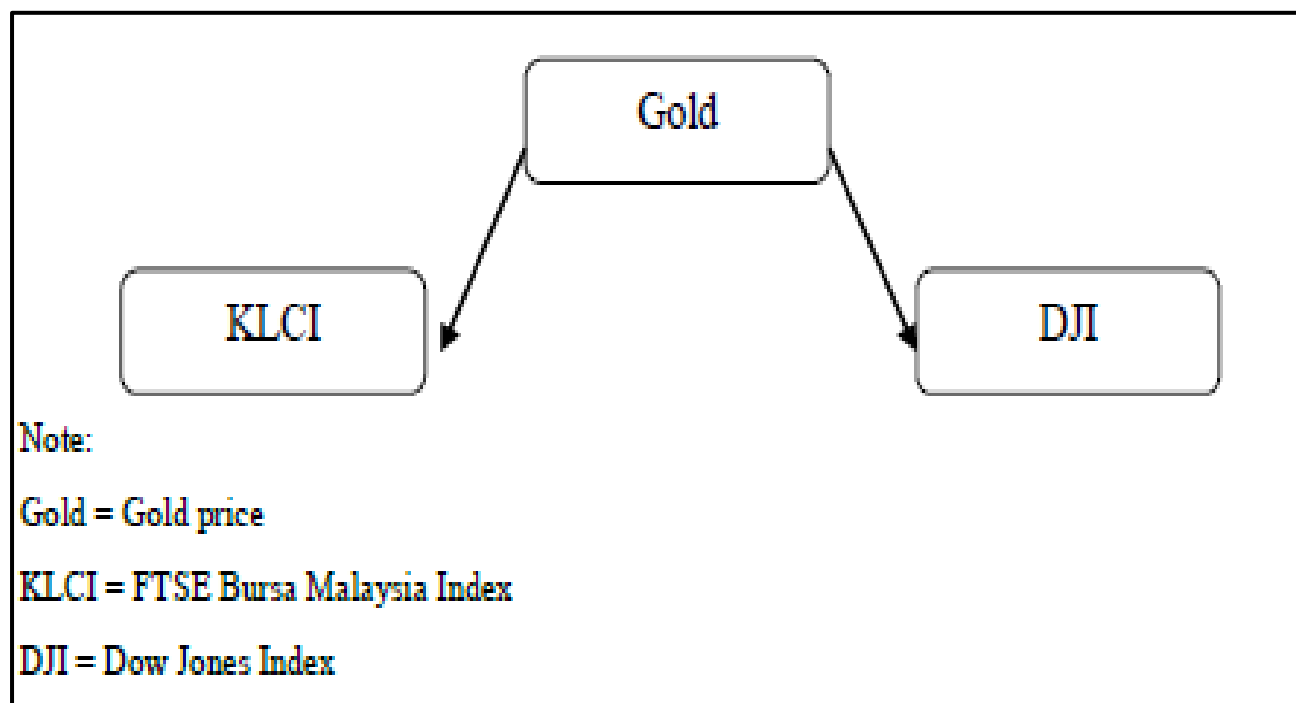
4.5 Granger Causality Test

After the co-integration test, this study will proceed with third test which is Granger Causality test which proposed by Granger (1969). It is used to check the causality relationship and determine the direction of this causality effect. Results are show in Table 4.5.1 and Table 4.5.2

4.5.1 Results

4.5.1.1 Causality Test among KLCI and Foreign Macroeconomic Variables

Table 4.5.1: Causality Test Among KLCI and Foreign Macroeconomic Variables			
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
KLCI does not Granger Cause GOLD	166	1.70920	0.1843
GOLD does not Granger Cause KLCI		6.19372	0.0026**
DJI does not Granger Cause GOLD	166	0.77930	0.4605
GOLD does not Granger Cause DJI		4.10085	0.0183**
DJI does not Granger Cause KLCI	166	3.04318	0.0504
KLCI does not Granger Cause DJI		2.77351	0.0654
** Significant at 1% significant level			
* Significant at 5% significant level			

Figure 4.5.1: Relationship between Each Foreign Macroeconomic Variables and KLCI for Granger Causality Test

Note:

Gold = Gold price
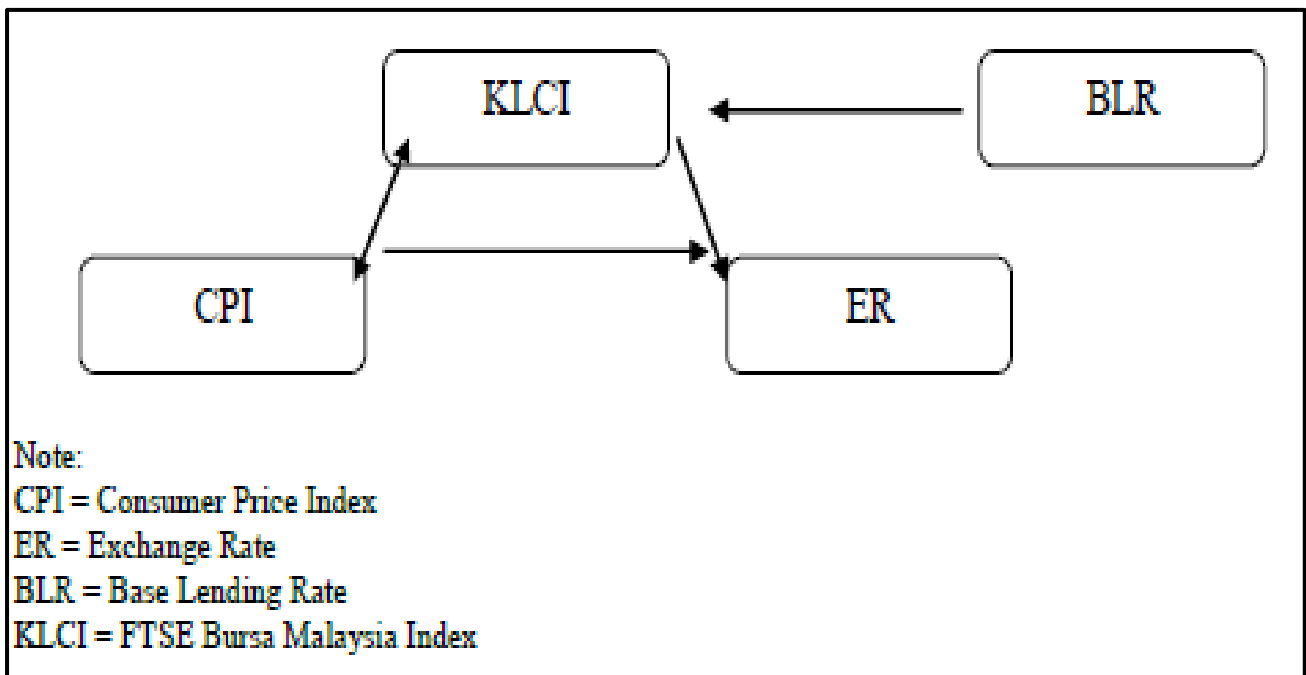
KLCI = FTSE Bursa Malaysia Index

DJI = Dow Jones Index

4.5.1.2 Causality test among KLCI and local macroeconomic variables

Table 4.5.2: Causality Test among KLCI and Local Macroeconomic Variables			
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
CPI does not Granger Cause BLR	166	1.00523	0.3682
BLR does not Granger Cause CPI		1.24261	0.2914
ER does not Granger Cause BLR	166	0.00639	0.9936
BLR does not Granger Cause ER		1.74383	0.1781
KLCI does not Granger Cause BLR	166	1.83364	0.1632
BLR does not Granger Cause KLCI		3.86950	0.0228*
ER does not Granger Cause CPI	166	0.88259	0.4157
CPI does not Granger Cause ER		7.66582	0.0007**
KLCI does not Granger Cause CPI	166	4.24062	0.0160*
CPI does not Granger Cause KLCI		4.09796	0.0184*
KLCI does not Granger Cause ER	166	6.00038	0.0031**
ER does not Granger Cause KLCI		1.16739	0.3138
** Significant at 1% significant level, * Significant at 5% significant level			

Figure 4.5.2: Relationship between Each Local Macroeconomic Variables and KLCI for Granger Causality Test

Note:
CPI = Consumer Price Index
ER = Exchange Rate
BLR = Base Lending Rate
KLCI = FTSE Bursa Malaysia Index

4.6 Gold LBM price (Gold)

4.6.1 Hypothesis

H_0: There is no Granger cause relationship between Gold LBM price and KLCI in short run

H_1: There is a Granger cause relationship between Gold LBM price and KLCI in short run

4.6.2 Decision Rules

i)   Do not reject H_0 if the probability is not significant at 1% or 5% significance level.

ii)   Reject H_0 if the probability is significant at 1% or 5% significance level.

From the Table 4.4.1, the result is significant and therefore can reject null hypothesis that the Gold does not Granger cause KLCI. The probability is 0.0026 at 1% significance level, this shows that Gold has a very strong Granger cause impact on KLCI index. As mentioned in previous chapter, mostly countries used gold as one of their hedging tool, this caused gold price fluctuate. Malaysia government did purchase gold for hedging purposes as well, this means that if the gold price reduce, it will directly reduce the amount of reserve in Malaysia, and if the gold price increase, it will directly increase the amount of reserve in Malaysia, so gold price can Granger cause KLCI strongly.

4.7 Dow Jones Index (DJI)

4.7.1 Hypothesis

H_0: There is no Granger cause relationship between Dow Jones Index and KLCI in short run.

H_1: There is a Granger cause relationship between Dow Jones Index and KLCI in short run.

4.7.2 Decision Rules

i)   Do not reject H_0 if the probability is not significant at 1% or 5% significance level.

ii)   Reject H_0 if the probability is significant at 1% or 5% significance level.

From the Table 4.4.1, the result is not significant and therefore we cannot reject the null hypothesis that the DJI does not Granger cause KLCI. The probability is 0.0504 which is only at 10% significance level which shows that the Granger cause relationship is in weak form. It was initially thought that US is Malaysia's top 5 exporter country, so when Us's economic weaken, it will impact to Malaysia economic, but it was rejected by this result, this result statistically shows that DJI only can granger cause Malaysia stock market in weak form. This might be resulted from China now keep growing and become Malaysia's important exporter country, so Malaysia economic no longer being affected by US economic directly.

4.8 Base Lending Rate (BLR)

4.8.1 Hypothesis

H_0: There is no Granger cause relationship between Base Lending Rate and KLCI in short run

H_1: There is a Granger cause relationship between Base Lending Rate and KLCI in short run

4.8.2 Decision Rules

i)   Do not reject H_0 if the probability is not significant at 1% or 5% significance level.

ii)   Reject H_0 if the probability is significant at 1% or 5% significance level.

From the Table 4.4.2, the result is significant and therefore can reject null hypothesis that the BLR does not Granger cause KLCI. The probability is 0.0228 at 5% significance level, this shows that BLR has Granger cause impact on KLCI index. This is mainly due to BLR play an important roles in Malaysia economic, when the interest rate increase, people tends to keep their money away from stock market and deposit in bank to earn higher return whereas when interest rate decrease, people will withdraw the money from bank and invest in stock market to earn higher return, this will indirectly influence the stock market.

4.9 Consumer Price Index (CPI)

4.9.1 Hypothesis

H_0: There is no Granger cause relationship between Consumer Price Index and KLCI in short run

H_1: There is a Granger cause relationship between Consumer Price Index and KLCI in short run

4.9.2 Decision Rules

i)   Do not reject H_0 if the probability is not significant at 1% or 5% significance level.

ii)   Reject H_0 if the probability is significant at 1% or 5% significance level.

From the Table 4.4.2, the result is significant in both direction and therefore can reject null hypothesis that the CPI does not Granger cause KLCI and KLCI does not Granger cause CPI. The probability is 0.0184 and 0.0160 at 5% significance level, this shows that CPI has Granger cause impact on KLCI index and vice versa. When the inflation rate increase, this will increase the opportunity cost of holding money and this will discourage investment because the earning will less

than opportunity cost, thus central bank will increase interest rate to hedge against the high inflation rate and cause increase in borrowing cost, so this will reduce the company to borrow money for expansion and reduce the economic growth in Malaysia.

4.10 Exchange Rate (ER)

4.10.1 Hypothesis

H_0: There is no Granger cause relationship between Exchange Rate and KLCI in short run.

H_1: There is a Granger cause relationship between Exchange Rate and KLCI in short run.

4.10.2 Decision Rules

   i)   Do not reject H_0 if the probability is not significant at 1% or 5% significance level.

   ii)   Reject H_0 if the probability is significant at 1% or 5% significance level.

From the Table 4.4.2, the result is not significant and therefore we cannot reject the null hypothesis that the ER does not Granger cause KLCI. The probability is 0.3138 shows that ER does not Granger cause KLCI but the KLCI is Granger cause ER because the probability is 0.0031 at 1% significance level. Exchange rate is found cannot Granger cause KLCI mainly is because stock market is located in Malaysia and traded in Malaysia Ringgit, it is not related to Singapore Dollar (used in exchange rate), so ER cannot Granger cause KLCI. Nevertheless, KLCI is found that can Granger cause ER at 1% significance level, this is mainly because Malaysia economic can influence the currency movement and KLCI is represent Malaysia economic performance.

4.11 Conclusion

This chapter shows the empirical results obtained from e-views, it has been well shown in table form and figure form. Furthermore, clear explanations have been written for each result. Summary of the whole study will be presented in the next chapter.

5.1 Summary, Discussion and Conclusion

In this chapter, firstly this study will present the summary of the findings in previous chapter in table and further discuss on it. Next will be the implication of this study and limitation of this study will be presented. Furthermore, recommendations for future research and conclusion will be presented in the last section in this chapter.

5.2 Summary of Major Findings

Table 5.1: Summarize of Major Findings			
Dependent Variable	**Independent Variable**	**Unit Root Test**	**Granger Causality Test**
KLCI	Gold	Stationary	Significant at 1%
KLCI	DJI	Stationary	Not significant
KLCI	BLR	Stationary	Significant at 5%
KLCI	CPI	Stationary	Significant at 5%
KLCI	ER	Stationary	Not significant

Refer to the above table, it shows that Gold, BLR and CPI having short run relationship with KLCI, whereas DJI and ER are found that not significant. Gold has the strongest influence toward KLCI compared to other macroeconomic variables and significant at 1% significance level. BLR and CPI have short run relationship with KLCI and significant at 5% significance level.

Table 5.2: Summary of Johansen & Juselius Co-integration Test	
Long Run Relationship Test: Johansen & Juselius Co-Integration Test	
Trace test	Max Eigenvalue Test
Co-integrated at r=0	Co-integration at r=0

Above table is the summary for co-integration test for local and foreign macroeconomic variables. The trace test and max eigenvalue test are both co-integrated at r=0, this proven that there is existence of long run relationship among these variables.

5.3 Discussion

There are total 3 local macroeconomic variables and 2 foreign macroeconomic variables used in this study to investigate the relationship between these macroeconomic variables and Malaysia stock market. Consumer price index as proxy for CPI, BLR as proxy for interest rate and exchange rate are used as local macroeconomic variables whereas Gold bullion price and Dow Jones index are used as foreign macroeconomic variables.

Refer to table 4.3(a) and table 4.3(b), we can see that the results for ADF test and PP test are not stationary in normal testing, but where performed first difference testing, the results shows that all the variables are significant at 1% significance level, these indicate that all the variables are stationary and can be proceed to further testing. It is very crucial that we can only use stationary variables to perform further analysis, according to Seyed, Zamri & Lai (2011), if the model consists of non-stationary variables, the usual test statistic T test and F test would not have the standard distribution, it might lead to spurious regression. This study has fulfilled the requirement that must use stationary data to conduct further analysis.

Johansen & Juselius Co-integration test has performed after unit root test, this method is to test the long run relationship among these variables. This test was performed in 2 groups, the first group is KLCI with foreign macroeconomic variables and results are show in table 4.4.1(a) and table 4.4.1(b), the second group is KLCI with local macroeconomic variables and results are show is table 4.4.2(a) and table 4.4.2(b). The main reason for dividing into 2 groups is because these variables consists of local and foreign macroeconomic variables and this study is to check long run relationship for foreign variables and KLCI as well as local variables and KLCI. The results for both Trace test and Max Eigen Value test show that the statistic values were larger than its critical value at significant level of 5% at r=0, thus H_0 is being rejected and this shows that the long run relationship exists between foreign macroeconomic variables and KLCI. Meanwhile for local macroeconomic variables, the results for both Trace test and Max Eigen Value test show that the statistic values were larger than its critical value at significant level of 1% at r=0, this indicate that the co-integration relationship among local macroeconomic variables and KLCI are stronger if compared to foreign variables.

The overall results for Johansen & Juselius Co-integration test show that the long run relationship not only exists among local macroeconomic variables and local stock market, whereas the foreign macroeconomic variables do have long run relationship with local stock market especially US's macroeconomic variables. From the results, it has showed that there are at least 1 macroeconomic variable that can influence Malaysia stock market in long run, it is mainly because all the macroeconomic variables included local and foreign were believed will have impact to the Malaysia stock market, so it is proven that it is correct that the macroeconomic variables being used in this study have relationship with KLCI. In the study of Osamah (1999), this study had proven that US's macroeconomic variables such as US inflation rate, US industrial production, US unemployment rate, US nonfarm payroll, US retail sales, US current account, US trade balance and US federal reserve are not co-integrated and with the inflation rate in Australia, Japan, Hong Kong, South Korea, Indonesia and Malaysia, this is suggest that the Fisher effect may not exist in these countries, Fisher effect suggests that in long run stock market compensate for changes in the purchasing power of money, remains pivotal to the rationality and efficiency of markets. Meanwhile in studies of Ratneswary (2010) and Prapha & Subhash (2002), they have proven that inflation rate was co-integrated and have long run relationship with KLCI, so this indicate that US macroeconomic variables are co-integrated with KLCI since they were co-integrated with Malaysia inflation rate.

After checked the long run relationship among these variables and KLCI, this study continue to investigate the short run relationship among these variables and direction of them by using Granger Causality test. This test is similar with co-integration which testing in 2 different groups, the first group is foreign macroeconomic variables and KLCI whereas the second group is local macroeconomic variables with KLCI. The results for KLCI as dependent variable are shown in table 5.1, DJI and ER were found that cannot granger cause KLCI, meanwhile BLR and CPI were found granger cause KLCI at 5% significance level, Gold was found granger cause KLCI at 1% significance level which indicate that Gold Bullion LBM price plays an important in influence FTSE Bursa Malaysia KLCI. The results for DJI and ER are surprising in this study, because initially they were assumed that both of these variables have relationship with KLCI. The result for ER in this study shows that it is not significantly granger cause KLCI, this study is not same with previous studies such as Aisyah, Noor & Fauziah (2009), Prapha & Subhash (2002), Seema & Paresh (2012), Rosylin, Shabri, Ahmad (2006), Caroline et. al. (2011). All of these previous studies proven that the exchange rate are significantly granger cause to KLCI, after deeply analysis these studies, even though some of the previous studies using same period but previous researchers were using MYR/USD as a proxy for exchange rate, whereas MYR/SGD was used in this study and this study intends to investigate the impact of the recent appreciation of Singapore Dollar and result shows that Singapore Dollar was not granger cause KLCI. Another reasons that might cause this situation is Singapore Dollar give lesser impact to the Malaysia economic, Malaysia export lesser goods to Singapore compare with US country, previous study using US Dollar in their exchange rate, since US country was Malaysia top 5 larger exporter country, the

movement US Dollar will impact to Malaysia economic, and it will influence the Malaysia stock market. Meanwhile for Singapore Dollar, since it is not Malaysia strong exporter country, so Singapore Dollar gives lesser impact to Malaysia economic.

For inflation rate, the results show that it can granger cause KLCI in both direction and significant at 5% significance level. This result is consistent with previous studies such as Zukarnain & Sofian (2012), Caroline et. al. (2011), Mohamed Asmy et. al. (2009), these studies proven that the inflation rate can granger cause KLCI. Consumer price index was used commonly in these studies as proxy for inflation rate, the differences between the previous studies were only the period they adopted, but it is concluded the CPI can significantly granger cause KLCI no matter which time period is using. When inflation rate increase, this will reduce the investment and saving because of the higher holding cost, whereas when CPI decrease, it will increase the investment. When the inflation rate is high, this is reduce the expansion speed for most company because more cost is needed to expand during this period, so this will slow down the Malaysia economic growth.

For interest rate, the results in table 5.1 show that it can granger cause KLCI at 5% significance level at one direction only, this result is consistent with previous studies that interest rate can significantly granger cause KLCI. In the study of Caroline et. al. (2011), they used country Treasury Bill as proxy for interest rate and they found that the interest rate can granger cause KLCI. Meanwhile in the study of Mirza & Hashem (2013), they use KLIBOR as proxy for interest rate and investigate the relationship of interest rate and Malaysia Islamic stock market FTSE Bursa Malaysia Hijrah Shariah Index, they found that there is short run relationship between interest and Malaysia Islamic stock market. Thus, this study has confirmed the existence of short run relationship between interest rate and Malaysia stock market. When the interest rate is high, people will tends to deposit their money in bank to earn a higher interest rate and less invest, whereas when the interest rate is low, people will shift their money from bank and do some investment such as invest in stock market to generate higher return.

Meanwhile for Gold price, this study used Gold Bullion LBM as proxy for Gold price. The results in table 5.1 show that it is the strongest variable that can granger cause KLCI and significant at 1% significance level and in one direction. This is consistent with the assumption in chapter 2 that gold price plays an important in affecting KLCI. It is seldom to see previous researchers investigate the impact of gold price to KLCI, but it undeniable that gold is becoming more popular now as its value kept increasing and many countries still using gold as hedging tool. The gold price will directly influence the amount of assets in Malaysia, when the gold price reduce, the amount of reserve in Malaysia will become reduce, this will impact to Malaysia economic and hence reduce the stock market performance.

5.4 Implications of the Study

This study provides useful information to public especially to investors, policy makers, bank institutions, central bank, and economists. These categories of peoples will obtain the largest benefit from this study, they will have more understanding towards the relationship of gold price (Gold), Dow Jones index(DJI), inflation rate (CPI), interest rate (BLR), exchange rate (ER) with our Malaysia stock market index (KLCI). This study also provides whether the relationship among these variables exist in short run or long run.

For the interest rate, it has short run relationship with KLCI, according to the theory, when central bank increases the interest rate, mostly investors prefer to save their money in bank to earn higher profit compared to invest in stock market but if central reduce the interest rate, investors will tend move their money to the stock market and eventually cause the stock price to increase. This study has showed that it can granger cause KLCI, investors might set their portfolio accordingly when there is movement in interest rate to increase their investment returns. When the interest rate increases, investors can move out from stock market and invest in other area.

Meanwhile for inflation rate, this study showed that it can granger cause KLCI in both direction. This means that the inflation rate can granger cause KLCI and vice versa, this information is useful for policy market as well as investors, policy maker can predict the future trend for the inflation rate by using KLCI performance, so they can have well preparation before the inflation rate of a country increase. When they can predict that the inflation rate will increase in very soon, so they can prepare and reduce the impact of the inflation rate increase to the residents.

For the exchange rate, the results show that it is not granger cause stock market, but surprisingly this study found that KLCI can significantly granger cause exchange rate at 1% significance level. This will benefit to those who plan to visit Singapore in near future, they can plan to exchange Singapore Dollar currency by referring to Malaysia stock market KLCI because this study proven that KLCI can granger cause exchange rate.

The last macroeconomic variable used in this study is gold price, the empirical results show that gold price is significantly granger cause KLCI at 1% significance level and in the same time gold price is significantly granger cause DJI at 5% significance level. This is a strong support that gold can influence the KLCI, so policy makers, investors, bank institution can use the movement of gold price to predict the trend of KLCI. Investors can set their portfolio accordingly to increase their investment return, whereas policy makers can use this information to predict the future macroeconomic

status such as inflation rate and well prepare to reduce the bad impact of it, meanwhile bank institutions can use this information to expand their investment to oversea such Dow Jones Index to increase their investment returns.

5.5 Limitations of the Study

Even though this study might provide useful information for those who need it such as researchers, investors or policy makers, but it has some limitations.

This study only investigates the relationship between 5 macroeconomic variables and Malaysia stock market, additional work can be done on different stock market for developing countries such as Indonesia, Vietnam, Thailand, Philippine and so on due to different status of cultural, background and political issue to verify these results. Furthermore this study can also include with other macroeconomic variables which can influence the country economic growth such as GDP, money supply, federal fund, foreign currency reserve and so on.

Secondly, this study only use data for 14 years period from Jan 2000 until Dec 2013, perhaps a longer period of data such as 20 years or 30 years data could be used to generate a more refine result. Moreover, this study could include structural breaks for the 2008 economic crisis and explore its effect to the stock market even though this economic crisis was not originated from Asian country.

5.6 Recommendations for Future Research

Future researchers are encouraged to add other methodology such as variance decomposition or OLS to have a more clearly information of these variable's behavior. Different approach of granger cause such as Wald test and VAR can be use in their study, this can increase the validity and consistency of the results.

5.7 Conclusion

As a conclusion, the results from this study found that these variables are stationary at the first difference in ADF test and PP test, this shows that all the variables employed in this study are stationary. Meanwhile, form the results of Johansen & Juselius Co-integration test, all the macroeconomic variables were significantly has long run relationship with KLCI. Moreover, in the Granger causality test, only Gold, BLR and CPI were found can significantly granger cause KLCI at 1% and 5% significance level. DJI and ER found no short run relationship with KLCI. Meanwhile, KLCI was found can significantly granger cause ER and CPI at 1% and 5% respectively.

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