

**IMPACTS OF MACROECONOMIC FACTORS ON
THE PERFORMANCE OF STOCK MARKET IN
MALAYSIA**

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We hereby declare that:

- (1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.
- (2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.
- (3) Equal contribution has been made by each group member in completing the research project.
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Five team members who work together to complete this research even though having different opinions.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
ARCH	Auto Regressive Conditional Heteroscedasticity
ASEAN	Association of Southeast Asian Nations
BG	Breusch Godfrey
CPI	Consumer Price Index
EGARCH	Exponential Generalized Autoregressive Conditional Heteroskedasticity
EMH	Efficient Market Hypothesis
EPS	Earning Per Share
EXCHG	Exchange Rate
E-Views	Econometrics View
FEVD	Forecast Error Variance Decomposition
FTSE	Financial Time Stock Exchange
GARCH	Generalized Autoregressive Conditional Heteroscedasticity
GDP	Gross Domestic Product
IBOV	Ibovespa Brasil Sao Paulo Stock Exchange Index
IPI	Industrial Production Index
IR	3 month Malaysia Government Securities
IRF	Impulse Response Function
ISE	Istanbul Stock Exchange
KLCI	Kuala Lumpur Composite Index
LM Test	Lagrange Multiplier Test
LOGCPI	Natural Logarithm of Consumer Price Index
LOGEXC	Natural Logarithm of Exchange Rate
LOGIPI	Natural Logarithm of Industrial Production Index

LOGKLCI	Natural Logarithm of Kuala Lumpur Composite Index
LOGM2	Natural Logarithm of Money Supply Category 2
M1	Money Supply Category 1
M2	Money Supply Category 2
M3	Money Supply Category 3
NSE	Nigeria Securities Exchange
OLS	Ordinary Least Square
PP	Philip Perron
VAR	Vector Autoregression Analysis
VDC	Variance Decomposition Technique
VECM	Vector Error Correction Model

PREFACE

Stock market is a key element in the economy as it is important to determine the growth in industry. Stock market involves valuation of securities based on the market forces. This is useful for users in decision making. Stock market is carefully monitored by policy makers since it carries the role to affect economic development. There are many macroeconomic factors which influence stock market return in the long run.

We conduct this research by using five independent variables which are gross domestic product, interest rate, inflation rate, money supply and exchange rate to examine the effect on stock market performance in Malaysia. These variables are possible to be the root of stock market volatility. There are a lot of researches conducted about this topic, however, the research in Malaysia is very limited.

This research will provide the result of the impact of selected macroeconomic factors on stock market in Malaysia. The users will have a better understanding on the impact of macroeconomic factors on Malaysia's stock market.

ABSTRACT

This study examines the impact of macroeconomic factors on Kuala Lumpur Composite Index (KLCI) stock return from January 1998 to December 2014 by using monthly data, which consist of 204 observations. This study has employed Augmented Dickey Fuller (ADF) test, Phillip Perron (PP) test, Johansen Juselius cointegration test, Vector Error Correction Model (VECM) and Granger causality test. This study will identify the long run relationship between dependent and independent variables. It is found that there is long-run equilibrium relationship between stock market return in Malaysia and exchange rate, gross domestic product, inflation rate, money supply and interest rate. Besides, interest rate and money supply have positive impacts while inflation rate has a clear negative impact on Malaysia stock market return in the short run dynamic relation. The regression model has no heteroscedasticity, no autocorrelation and the error term is normally distributed.

Keyword: exchange rate, gross domestic product, inflation rate, money supply, interest rate, KLCI

CHAPTER 1: RESEARCH OVERVIEW

1.0 Background of Study

Stock market is a market that brings the buyers and sellers of stock together in the business. Stock market is crucial to disseminate the information for the growth of an economy in a country. It also acts as a platform that allows the people to trade the share publicly by buying and selling in the market. The stock market in Malaysia possesses the special feature and is able to trigger the stock price movement of pattern from the economies. There is an increasing awareness and attention being drawn to the relationship between stock market return and macroeconomic variables. These macroeconomic variables namely exchange rate, consumer price index, industrial production index, money supply and interest rate are used as they represent good and bad news in stock markets. These variables have significant relationship with the stock prices and they able to predict stock price as well. Coupled with that, it is supported by Maysami and Koh (2000), Mukherjee and Naka (1995), Rjoub, Türsoy and Günsel (2009), and Al-Zararee and Ananzeh (2014) who stated that these five variables is crucial and important in explaining the stock price movement.

The market is considered efficient when stock price is the reflector of all available information. Stock markets become very efficient in mirroring information about a single share and even the whole stock market. The public can know the info without single delay whenever new information is coming in and stock prices reflect all information. An investor could forecast future prices by studying past stock prices or analyze information obtained to identify underestimated shares to earn returns. Nevertheless, the investor cannot earn abnormal returns by holding the stocks without taking additional risks in efficient market (Malkiel, 2003).

Behavioral Finance is a theory that developed by sociologists and psychologists which has different perspective against efficient market theory. In Efficient

Market Hypothesis, most of investors make reasonable choices using information obtained and the market prices reflect the true value at all the time and behaviorists state that sometimes investors make irrational decisions. Singh (2010) believe that investors' psychology can affect the market price. Shiller (2003) illustrates the progress of behavioral finance with feedback models and obstacles to smart money. In feedback models, when stock prices increase, some investors gain profits and this could attract potential investors, to expect stock prices increase further. The stock prices will increase once due to greater demands from public. If this situation lasts continuously, it will create a speculative "bubble", where high expectation for further prices increase comes from investors. The bubble in the end will burst and prices of the stock decrease because the high price is due to expectation from investors.

The global financial crisis happened in 2007/2008 and led to all financial market around the world being affected. Therefore, volatility of changes in stock markets has become a great concern. Coupled with that, financial market volatility becomes a vital aspect when the strategies are set up for options pricing, portfolio management and market regulation. It is found that stylized characteristics like leverage effect, clustering effect and asymmetric and leptokurtosis are exhibited by Kuala Lumpur Composite Index (KLCI). The volatility and leverage effect are found to have a significant increase but just a little decline in persistency because of the event of financial crisis (Premaratne & Balasubramanyan, 2003).

Although the occurrence of the global financial crisis is at the late 2007, there is still a huge impact on the financial system which consists of financial markets and institutions all over the world. There were several issues and questions left an impact on the global stock markets, where the securities experienced great losses at the end of 2008 and beginning of 2009 and Malaysia was affected as well that it was no exception. These questions include bank solvency, decrease in credit availability and poor or damaged investor confidence. The market indicator and main index in Malaysia, Kuala Lumpur Composite Index (KLCI), declined about 558.93 points in 2008 and then it comes to an approximately 40% decline in its value (Angabini & Wasiuzzaman, 2011).

According to the Malaysian Insider News, it mentioned that the stock market in Malaysia is at a risk of becoming a bubble in 2013 as strong increase in credit always result in insufficient investment. From Trading Economics, it is stated that the Malaysia Stock Market (FTSE KLCI) declined to 1735.63 points in June 2015. Other than that, there was stock market run-up in Malaysia in the early 1990s prior to Asian crisis while the Malaysia market regained strength in post Asian crisis.

In 2008 and 2009, it can be seen that because of mortgage bubble burst, the Global meltdown or recession began in US. There was a slowdown in real economies and financial markets witnessed by the Asian Countries. It is also stated that market in Indonesia were obtaining decreasing returns, as indicated by high negative skewness. From the study under Gupta (2011), it has revealed that there is low negative asymmetry indicating opportunities for investment for markets in Hong Kong, Korea and India in both short run and long run. For markets in Malaysia and Indonesia, it indicated weak relationship between stock market return and asymmetry of these returns. Other than that, markets in Malaysia and Japan were exception indicating positive returns but positive skewness. A positive skewness means the concentration of returns towards the lower values. When the negative skewness is higher, the reward for further gains is lesser. Thus, this study would like to examine the relationship between the stock market return and macroeconomic variables in the point of view of asymmetric.

1.1 Problem Statement

The relationship between stock market and macroeconomic variables become a popular topic in financial research. Stock market is a crucial part of the economy as it acts as an important role in industry growth. Stock market supports fiscal and monetary policies. It also involves in the valuation of the securities based on the demand and supply factors. Such valuation is important and useful for various users such as investors, government and creditors. Besides, the roles that stock

market plays will affect the economic development. That is why government, industry and central banks from all over the world concern about the happenings of the stock market from times to times. There are researchers make the investigations about the relationship between macroeconomic determinants and stock price on countries like Taiwan (Singh, Mehta & Varsha, 2011), China (Li, Zhu & Yu, 2012), India (Patel, 2012), New Zealand (Gan, Lee, Yong & Zhang, 2006) and Pakistan (Alam & Rashid, 2014). In reality, the market is asymmetric and not wholly symmetric since there is difference for the effect of positive and negative shock. Therefore, it is important to estimate and examine the macroeconomic variables and stock prices in the view of asymmetry. The macroeconomic factors include interest rate, consumer prices index, industrial production index, money supply and interest rate were highlighted as these variables have significant impacts on the stock market return. To measure the impacts of macroeconomics factors, the time series data method will be used and from the year of January 1998 to December 2014 with the monthly basis.

1.2 Research Objective

1.2.1 General Objective

The current research of this study will attempt to find out the significant relationship between Malaysia stock return and macroeconomics factors which are interest rate, consumer prices index, exchange rate, industrial production index and money supply in the long run.

1.2.2 Specific Objective

This study focuses on:

- i) To examine the long run relationship between stock return with macroeconomic variables namely exchange rate, consumer price index, industrial production index, money supply and interest rate.
- ii) To examine the short run causality between the stock return with macroeconomic variables namely exchange rate, consumer price index, industrial production index, money supply and interest rate.

1.3 Research Question

This study focuses on:

- i) Is there the long run relationship between stock return with macroeconomic variables namely exchange rate, consumer price index, industrial production index, money supply and interest rate?
- ii) Is there the short run causality between the stock return with macroeconomic variables namely exchange rate, consumer price index, industrial production index, money supply and interest rate?

1.4 Hypothesis of the Study

1.4.1 Exchange rate

H_0 : There is no significant relationship between stock market return (KLCI) and exchange rate in Malaysia.

H_1 : There is a significant relationship between stock market return (KLCI) and exchange rate in Malaysia.

According to Ooi, Wafa, Lajuni and Ghazali (2009), exchange rate has a stout linkage with the stock market return in Malaysia. Exchange rate can be determined and affected through the market mechanism. According to Nath and Samanta (2003), exchange rate not only will affect the multinational and export oriented firm, it will affect also the domestic firm's stock market return as well. An appreciation/depreciation of the exchange rate will influence the stock market return or price increasing/decreasing. In conclusion, there will be reject the H_0 where stock market return (KLCI) in Malaysia and exchange rate do have significant relationship.

1.4.2 Industrial Production Index (IPI)

H_0 : There is no significant relationship between stock market return (KLCI) and industrial production index in Malaysia.

H_1 : There is a significant relationship between stock market return (KLCI) and industrial production index in Malaysia.

According to Nishat and Shaheen (2004), industrial production index measures the real economic activity and real output and affects the stock market return through the influence on expected future cash flows. Industrial production index will increase the profit of industries and corporations through the raising in the production of the industrial sector. When the real activities increase, the production and revenue increase also and subsequently it leads the profit increase too (Rahman, Hatta & Ismail, 2013). Hence, the industrial production and stock market return (KLCI) is positively related.

1.4.3 Consumer Price Index (CPI)

H_0 : There is no significant relationship between stock market return (KLCI) and consumer price index in Malaysia.

H_1 : There is a significant relationship between stock market return (KLCI) and consumer price index in Malaysia.

According to Bryan and Cecchetti (1993), consumer price index is fixed weight index of the cost of living that acts as a proxy or measures of an inflation rate. There is a negative relationship between them when inflation rate is higher it will increase the cost of living and shift the consumer's investment towards the consumption. Subsequently, the increasing of the inflation rate will restrict the monetary policies and have negatively impact on the stock market return. In conclusion, this study tends to reject the H_0 where there is negative correlation among the stock market return (KLCI) in Malaysia and consumer price index.

1.4.4 Money Supply (M2)

H_0 : There is no significant relationship between stock market return (KLCI) and money supply (M2) in Malaysia.

H_1 : There is a significant relationship between stock market return (KLCI) and money supply (M2) in Malaysia.

Money supply is a monetary tool that has a direct impact towards the banking system and the Central Banks (Bank Negara Malaysia). According to Ratneswary and Rasiah (2010) stated that there was positively relationship between the KLCI return and Malaysia money supply. High in the money supply causes the higher liquidity and this leads to interest rate declines and increases the demand among the people. At the end, it increases the KLCI return in Malaysia. Hence, this study will reject

the null hypothesis where money supply has a significant relationship towards the stock market return (KLCI).

1.4.5 Interest Rate

H_0 : There is no significant relationship between stock market return (KLCI) and interest rate in Malaysia.

H_1 : There is a significant relationship between stock market return (KLCI) and interest rate in Malaysia.

Alam and Uddin (2009) stated that an interest rate can be cost of capital, borrowing rate and lending rate as well. Therefore, interest rate has negative effects on the stock market return (KLCI) and interest rate and stock market return (KLCI) is negatively correlated. When interest rate rises, it attracts people to demand for deposit. Cost of borrowing becomes higher, therefore it will lead to decrease in investment and hence, stock prices reduce.

1.5 Significance of Study

This study would like to observe the relationship between the stock return in the Malaysia's market and macroeconomics factors which are known as consumer prices index, interest rate, money supply, exchange rate, and industrial production index in the long run. Thus, this study mainly contributes to the analysis of the significant relationship between stock market performance and of the macroeconomics (independent) variables. This entire macroeconomics variable is very useful information and as important tools for various users such as policy makers, investors, government and so on. As the Malaysian Insider News had mentioned that the stock market in Malaysia is at risk and become a bubble in 2013. Therefore, detail research on Malaysia's stock market is necessary.

There are many previous researches that using some macroeconomics variables such as money supply, inflation and interest rate to investigate on the relationship between stock market performances. The policy makers in Malaysia can make use of this study as an important instrument to assess the causes of the volatility of the stock market and to stabilize the stock market return. Besides, it could help the policy makers to conduct the fiscal or monetary policy and it also provide a correct direction and right decision making.

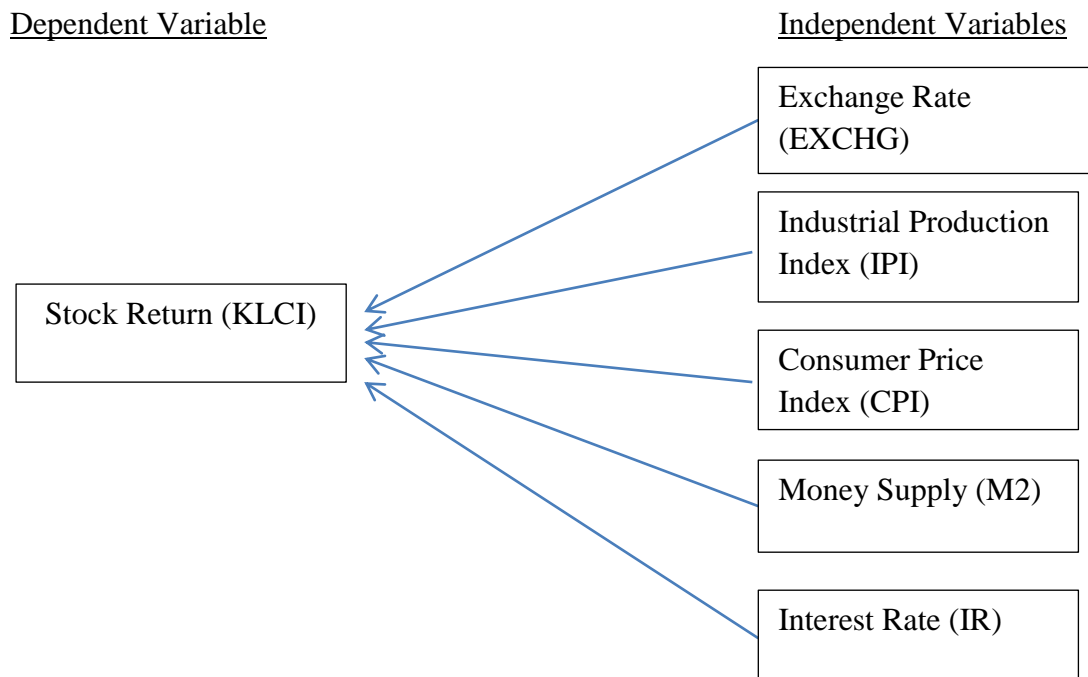
From the perspective of investors in Malaysia, they can use the information and the contribution of this finding to get better understanding on the flow in the stock market and also to forecast the movement of the stock market in Malaysia. Thus, they also use this information as a tool to provide a right decision whether to sell or buy the stock in the stock market. Other than that, more awareness will be created for them on the government policy toward the stock market. As a fund manager or portfolio manager, they can handle the fund efficiently and effectively and provide it to their customers. Thus, they also use the information to hedge the stock efficiently.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

Several journals had been reviewed to study the relationship. The relationship between stock market return and the macroeconomic factors is popular and well known by researchers. Previous studies enable potential researchers to identify which macroeconomic factors impact towards return of stock market to conduct their research.

Figure 2.1: Proposed Framework of factors influencing stock prices in Malaysia's stock market from January 1998 to December 2014



Source: Developed for the research

2.1 Review of Literature

2.1.1 Stock Market Return

The rate of return generated by the investors from capital gains and dividends out of stock market is stock market return. It is important to have a fully understanding on the link between stock market and economic growth to help the investors to predict the trend of overall market for a better investment decision according to stock market activities. By having a thorough understanding on stock market, the government and private sectors can ensure the effectiveness of each policy that implement as the empirical facts would serve as a useful guidance (Tang, Habibullah & Puah, 2007).

The efficient market hypothesis (EMH), or known as Random Walk Theory suggests that stock prices adjust quickly and fully for the coming new information. Thus, all information in the market is reflected in stock values. There is no way to earn excess profit. According to Muhammad and Rahman (2010), Malaysia stock market is considered in the weak form of efficiency. One of the reasons is the stock market in Malaysia is closed on both Saturday and Sunday. The investors cannot utilize the information immediately although the information is obtained during weekend and this creates the market anomalies.

Previous studies have documented the relationships between macroeconomic factors and equity market return. The studies show that macroeconomic variables are important to determine equity market return. However, the studies provide different results since the data used and the countries studied are not the same. Ouma and Muriu (2014) found that, in Kenya, inflation, exchange rate and money supply have effects on the equity market return significantly while interest rate is insignificant to NSE return in long run. While Barnor (2014) found that exchange rate,

interest rate and money supply are important variables and affect equity market return negatively in Ghana. Inflation does not significantly affect stock market return.

The relationship between Istanbul Stock Exchange (ISE) return and GDP, interest rate, exchange rate and current account balance in Turkish economy is studied by Acikalin, Aktas and Unal (2008). The researcher found a stable correlation between ISE and the macroeconomic factors by using co-integration tests, vector error correction model and causality tests on a quarterly data set. There are unidirectional relationships between ISE index and the macroeconomic factors.

Alam and Rashid (2014) analyze the relationship between Karachi stock market 100 index and macroeconomic variables. The results show there are significant relationships between stock prices and the macroeconomic variables in Pakistan. While for the studies on Asian countries, Rahman, Sidek and Tafri (2009) study the relationship between stock prices in Malaysia and macroeconomic variables using vector error correction model. The outcome is the changes in KLCI do perform a co-integrating relationship with changes in all of the tested independent variables. Singh et al. (2011) examine whether Taiwan 50 Index return causally affect macroeconomic variables in Taiwan. The result shows that GDP and exchange rate will affect all the classes of portfolio return. There are negative relationships between the portfolio returns and inflation rate, exchange rate and money supply for big and medium companies.

2.1.2 Exchange Rate

Exchange rate can be measured by comparing the currencies of two different countries. It can be defined as the ratio of one currency expressed in other currency (Aslam, 2014). The relationship between these two variables has drawn attention of researchers, even for investors in

forecasting the future trends of stock market. Studies in the past have examined the correlation between exchange rate and equity market return and the findings are different. Most of the researchers found that the relationship is negatively related for the two variables.

According to Bhargava and Konku (n.d.), S&P 500 return could be affected by the volatility of dollar/euro exchange rate. Different GARCH models are used to find the result by using daily data from 2002 and 2009. The result shows the dollar appreciation and S&P 500 return have a negative relationship. It is explained that when dollar appreciates, domestic products become more expensive relative to foreign products, subsequently, import increases and export decreases. As the result, S&P 500 return go down.

Adjasi, Harvey and Agyapong (2008) performed EGARCH model and found that exchange rate volatility inversely and negatively affect the equity market return. When foreign currency appreciates, home currency tends to depreciate and equity market return in home country rise in the long run. While in the short run it reduces stock market return. Study of Subair and Salihu (2013) also found that the exchange rate has a negative effect on the Nigeria equity market.

According to Li and Huang (2008) performed the Engle-Granger co-integration test and found that long-run equilibrium relationship between equity return in China and RMB exchange rate are not exist using five percent significant error. However, changes in the nominal exchange rate affect equity return in short-run.

Paramati and Gupta (2013) found that exchange rate Granger cause stock return and there is no reverse causality from equity return to exchange rate. The relationship between them is bidirectional. However, Bhattacharya and Mukherjee (n.d.) found that Bombay Stock Exchange Sensitive Index did not causally influence exchange rate and vice versa

since all past information on exchange rate has already incorporated by Indian stock market.

Khan, Khan, Rukh, Imdadullah and Rehman (2012) use multiple regression models to study the effects of inflation rate, exchange rate and interest rate on Karachi Stock Exchange 100 index return by using 10 years data. The results show that exchange rate and equity price are negatively correlated. When exchange rate increases, foreign investors convert their return on investment into own currency. The return will be lower when converted into other currency. Therefore, they would not to invest and switch to other investment.

2.1.3 Industrial Production Index

Gross domestic product (GDP) can be known as the total market value of all the final goods and services produced by labor in an economy in a specified time frame. It is a popular method to measure a country's national income and output for the economy in a given time frame (Kira, 2013).

Index of Industrial Production will be selected as an alternative for GDP and it reflects the growth rate of industries. Patel (2012) mentioned that it is expected to have positive relationship between Index of Industrial Production and stock return. This positive relationship can be explained: when there is an increase in production, it will result in higher revenues and benefits for the firm, eventually; it also increases the volume of cash flows, hence, the stock return increases (Erdogan & Ozlale, 2005). Other than that, it is found that there is relationship between GDP and the equity return is significant. The finding about this positive and significant relationship is consistent with the studies by Fama (1981), Kaul (1987), Cochrane (1991) and Lee (1992). All these studies emphasize the positive relationship between these two variables through expected cash flow.

GDP growth tends to increase stock return since it stimulates corporate profit growth according to supply-side models. The positive relationship between GDP growth and aggregate earnings growth is supported by US GDP and corporate earnings over 80 years. The aggregate earnings growth will then transform into EPS growth. It is not guaranteed that all the earnings growth caused by GDP growth will lead to EPS growth. There are some factors such as new initial public offering or right issues that will stimulate GDP growth but not accessible to current investors. EPS growth will transform into stock price increases, only if that the price to earnings ratio remains unchanged. However, stock price increases will then reduce future realized return which becomes one of the discrepancies (MSCI, 2010).

According to the study of Ritter (2005), the relationships between real equity return and per capita GDP growth are negative for several countries investigated. The GDP growth was due to bigger factor inputs which are increased labor and high personal savings rate and which do not benefit the of capital holders. The rapid technology changes benefit consumers the most by increasing standard of living. Individuals tend to save and invest more and this lead to high in real wage rate that brings zero advantage to the capital owner. Therefore, the rate of GDP growth has little impact toward the future stock return in a country.

2.1.4 Consumer Price Index

Trading Economics (2016) shows Malaysia's inflation rate was 2.50% in June, 2015. The Department of Statistics Malaysia reported the interest rate. Consumer price index is the proxy for inflation rate. In Malaysia, the categories for consumer price index include food and non-alcoholic beverages, water, electricity, gas and other fuels. There was a rise of 1.4% of consumer prices from January to June 2015.

A broad increase in the level of prices of goods and services in a country is defined as inflation. In other words, there is a decrease in the real value of money which means the purchasing power in the medium of exchange decreases. When the general price level rises, consumers will buy fewer units of them as the goods and services has become more expensive (Singh et al., 2011).

There are numerous investigations on the correlation between inflation and equity return. According to Chen, Ross and Roll (1986), inflation is measured according to two variables. These variables include unexpected inflation and the change in expected inflation. The former means the distinction between actual inflation and inflation rate that expected while the latter means to reflect the inflation estimating from other economic factors. The research showed that inflation variables negatively affect the stock return. Coupled with that, Adrangi, Chatrath and Raffiee (1999) also support the negative sign and found that both inflation variables such as unexpected inflation and expected inflation negatively affect the stock return in Korea. Most of the empirical researches proved that stock return and inflation are having an inverse relationship (Geske & Roll, 1983; Fama & Schwer, 1977). The result is also similar with Liu and Shrestha (2008) who found that inflation and equity return were negatively associated by using heteroscedasticity cointegration to investigate their long term relationship in Chinese market. In addition, Reilly (1997) used data for Standard & Poor's 500 firms to investigate about how inflation affects stock return. Under this research, the findings showed that inflation negatively affect the profit margins of these companies. This negative correlation may lead to fact that the companies unable to pass on price increases through higher prices when the costs do rise. All this can bring to reflect stock return with the declined expected cash flows and result in lower prices.

In addition, the research of Fama (1981) revealed that real activity and the stock return are positively associated but there is negative association between the real activity and inflation through the money demand theory. In other words, the stock return and inflation are negatively related. Fama (1981) also stated that the dividend discount model can clarify the negative relationship between inflation and stock return. Furthermore, according to Shubita and Al-Sharkas (2010), the result showed that inflation inversely affects the stock prices.

However, on the other hand, the research under Boudoukh and Richardson (1993), Graham (as cited in Ibrahim & Agbaje, 2013), Choudhry (as cited in Ibrahim & Agbaje, 2013), Lee, Tang and Wong (2000) showed that there is a positive correlation between the equity return and inflation. Autoregressive Integrated Moving Average (ARIMA) model was implemented by Lee et al. (2000) to investigate the effect of German hyperinflation that occurred in 1920s on the stock return. The findings on this study show equity return and inflation is highly positively related. The researchers concluded that common stock is used to hedge against inflation during this period.

In 1930, Irving Fisher presented the hypothesis about the inferences on relation between the two variables, inflation and stock return. According to Fisher's hypothesis, a positive relationship between real assets return and expected inflation rate is confirmed. In other words, the increase in nominal stock return should come together with the inflation as stock hedge against inflation (Tripathi & Kumar, 2014). Previous empirical studies by Ratanapakorn and Sharma (2007) found that inflation positively affects the stock return providing that equity can be used to hedge against inflation. Exponential Generalized Autoregressive Conditional Heteroscedasticity (EGARCH) model was used for the study to examine the effect of stock return in Turkey and the result showed that there was a positive relationship between the stock return and the inflation (Kutan & Aksoy, 2003).

2.1.5 Money Supply

M1, M2 and M3 are the classification in details of money supply. Money is the most liquid things because it is the medium of exchange and can be used to repay the debts. Coupled with that, it helps to economize on the use of scarce resources devoted to exchange. It also can be used for the facilitation of trade, specialization, and contribution to the welfare of a society (Thornton, 2000).

Money supply is an important determinant of stock prices as it plays a crucial role to be a general indicator of economic expectations (Homa & Jaffee, 1971). There are numerous researches on the relationship between stock return and money supply. Money supply can affect stock prices positively or negatively. According to Fama (1981), inflation and money supply are positively related to each other, a rise in the available of money could result to boost the discount rate and decline the equity prices. Nevertheless, according to Mukherjee and Naka (1995), increase in money growth may raise cash inflows and equity prices. Patel (2012) found that the money supply and inflation is positive associated. However, these two variables have a dual consequence on the equity return. First, an increase in money supply will cause inflation; eventually will increase the expected rate of return. This will decline the firm's value and will result in lower share prices. Secondly, an increase in money supply and inflation will cause a rise in the firm's future cash flow, which result in increased expected dividend and will cause equity price increases.

Based on theories, negative effects of money supply on stock prices are found. The reason is that when the growth rate of money rises, it is expected that inflation rate will increase: eventually it will lower the stock price. However, a rise in money supply will provide economy stimulus and corporate earnings will rise. Therefore, it will likely enhance the future cash flows and stock prices (Gan et al., 2006). The research about the positive correlation among money supply and equity return is in sync with

Maysami and Koh (2000), Murkherjee and Naka (1995), and Kwon and Shin (1999). It found that there is a significant positive relationship between money supply and stock return. In other words, when there is increase in money supply will result in that investors rebalance their portfolio and will eventually lead to higher stock prices. This result is supported by Fama (1981), and Jensen, Mercer and Johnson (1996).

There are money supply which includes M1 and M2. Cash, account balances, coins, and traveler's checking flowing in the economy are measurement for M1. On the other hand, all the M1 variables and certificate of deposit, foreign bank deposits and money market account balances are included in M2. The former acts as a medium of exchange while the latter is used for the store of value. M2 is known as wider measure of money available. M2, the broad money supply is also defined as the total amount of monetary asset available in an economy.

According to Humpe and Macmillan (2007), it is stated that the money supply is likely to affect the stock prices via at least three mechanisms. First, when money supply changes, it could be related to unexpected rises in inflation and future inflation uncertainty and therefore, the negative relationship is established. Second, when the money supply changes, it could positively affect the equity prices by its impacts on the activities in the economy. Third, based on portfolio theory, it is suggested that there is positive relationship, which means money available increase may cause shifting investments from non-interest bearing money to financial assets such as equities.

2.1.6 Interest Rate

Interest rate is the important macroeconomic variable that has direct impact on economic growth. In general, interest rate is also referred as the cost of capital, which is the opportunity cost of making a specific

investment. Interest rate can be viewed in the point of view of borrower and the lender. For the former, interest rate is considered as the cost of borrowing which is the charge for borrowing debts. For the latter, interest rate is known as the investment rate which means the return earned by lenders who lend money to borrowers. When the interest rate offered by the banks to depositors rises, people will choose to invest in banks rather than in stock market. Eventually, the public do not demand stocks and the stock prices decline, vice versa. Moreover, if the interest rate paid to depositors by banks rises, the increase in the interest rate also lead to decrease in investments, and this is one of the reasons that the share price will reduce and vice versa. Rise in interest rate lends to people demand for deposits and the investment will reduce since the borrowing cost is higher, thereby, reducing the stock return in market. Therefore, in theoretical, there is an adverse correlation existed among share price and interest rate (Alam & Uddin, 2009).

According to Moya-Martínez, Ferrer-Lapena, and Escribano-Sotos (2015), it is stated that there might be a major impact on the value of non-financial firms caused by the movements in interest rate. Coupled with that, under the framework of present value models, when interest rate rises, it tends to raise the firms' cost of capital, it also means that future cash flow is discounted as a higher rate. Hence, it negatively influences the share values of the firms. Other than that, the rise in interest rate will raise the leveraged companies' interest paid and customers who are high in debts will decrease their demand for goods and services, in other words, there will be lesser corporate profits and it will have a negative effect on the share prices. The increase and decrease in interest rate have impact on the opportunity cost of equity investments. It is preferably to hold the stocks when there is higher interest rate for the bonds, eventually, investors will rebalance their portfolios by purchasing debts from proceed of equities, thereby reducing the stock prices. Therefore, all these impacts summarized that there interest rate fluctuations and stock return is adversely associated.

It is stated that prior to the crisis, the result done by the researchers, Erdogan and Ozlale (2005) suggested that the increase in interest rate and the depreciation of exchange rate can be considered as the crucial indicators of political and economic instability, rises the volatility in stock market. Furthermore, interest rate can be the significant factor that adversely affects the stock return.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter will include the step of methodology which includes the data description, data processing and data analysis on the methodology used in this research study. There is total of five macroeconomics variables and stock return (KLCI) as dependent variable is used conducts this research. In order to measure the impacts of macroeconomics factors, the time series data method will be used and from the year of January 1998 to December 2014 with the monthly basis, so there are 204 observations in this study. All of the five variables are obtained from the data stream database and Bank Negara Malaysia.

3.1 Data Description

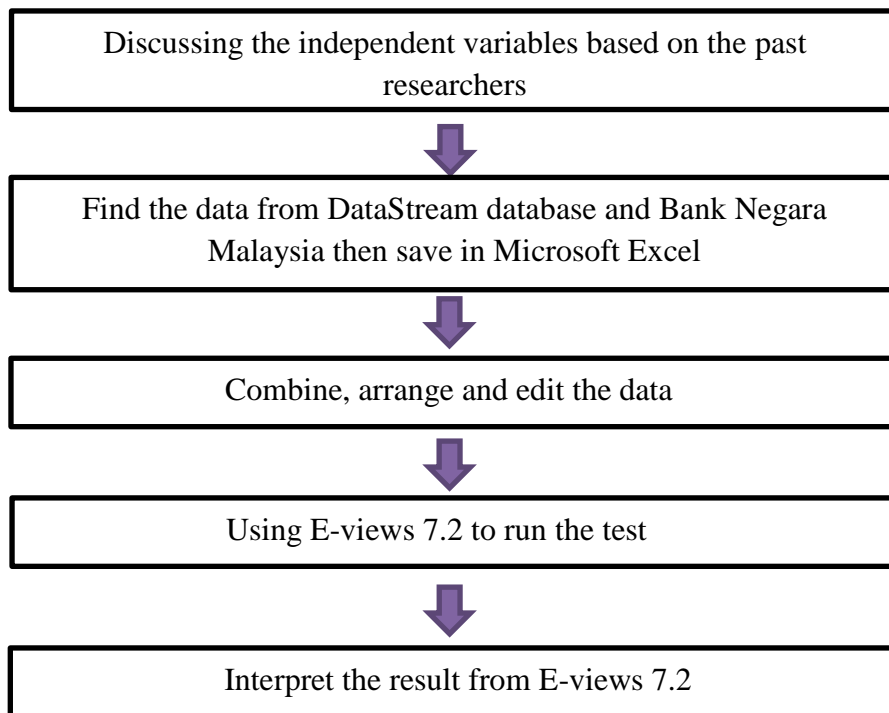
This study used the time-series data which is from January 1998 to December 2014. This study is using monthly basis data as the sampling method which consists of 204 observations.

3.2 Data Processing

There are five steps for the data processing in this research study. The first step of the data processing is discussing the independent variables that used in the research study which is based on the past researchers. The researchers will gather the journal from past researchers and find out which independent variables are suitable for research. After researchers decide the variables, they will get the data of the independent and dependent variables from data stream database and Bank Negara Malaysia. The period and sample size of the data will take into

consideration by the researchers too. All the variables that found from data stream database and Bank Negara Malaysia will be downloaded and saved into the spread sheet or Microsoft Excel. Besides, researchers will combine, arrange and edit all the data that had been gathered to run for the test. The fourth step of data processing is using the software which is E-views 7.2. E-views 7.2 helps the researchers to run the test for diagnostic checking such as ARCH test, Jarque Bera test, unit root test and so on in order to find out whether the regression model have face any problem. Lastly, the researchers will extract the result from E-views 7.2 in order to do the interpretation.

Figure 3.2.1: Data Processing



3.3 Multiple Regression Model

Regression Model

$$\text{LOGKLCI}_t = \beta_0 + \beta_1 \text{LOGEXC}_t + \beta_2 \text{LOGIPI}_t + \beta_3 \text{LOGCPI}_t + \beta_4 \text{LOGM2}_t + \beta_5 \text{IR}_t + \varepsilon_t$$

Where,

LOGKLCI = Natural logarithm of stock market return

LOGEXC = Natural logarithm of exchange rate

LOGIPI = Natural logarithm of industrial production index

LOGCPI = Natural logarithm of consumer price index

LOGM2 = Natural logarithm of money supply of category 2

IR = 3 month Malaysia Government Securities

t = 1998,, 2014

3.4 Data Analysis

3.4.1 Stationary Analysis (Unit Root Test)

According to Ouma and Muriu (2014), the stationary of the regression model between the dependent and independent variables means their variance is constant and the mean of the regression model is zero over the time. In short, if the time series is stationarity the mean and variance do not change throughout the time. If there is non stationarity problem, there will have different problems occur. The result that had been estimated does not contain the economic meaning where there is no relation between the variables since the R squares is high (Talla, 2013). Besides, there will have the spurious result happen among the unrelated variables of the regression

model (Talla, 2013). So, it is crucial to examine whether time series is stationarity or non stationarity. Thus, Augmented Dickey Fuller (ADF test) and Phillip Perron test (PP test) are used in order to test the stationarity or non stationarity of the time series.

3.4.2 Augmented Dickey Fuller (ADF) Test

ADF test is used to examine the time series data whether it is stationarity or non stationarity in order to escape from the spurious regression. Instead of that, ADF test also helps to determine the integration level of the variable and correct the serial correlation by add in the lagged differenced term in order to obtain the stationarity of the variables (Nantwi, Victor & Kuwornu, 2011). If the result shows that there is non stationarity in the time series data, the first difference and second difference of the variable will be conducted (Talla, 2013). Based on the E-views output, we can compare the p-value and the 1%, 5% and 10% significance level. If the p-value is more or greater than the 1%, 5% and 10% significance level, we will not reject the null hypothesis where the variable is not stationarity and have a unit root. Thus, the variables that had been tested are no have the time trend and follow the random walk with drift. In conclude the first difference of the variable will be conducted. Even though ADF is a good size but there is a poor power of the properties, hence Phillip Perron (PP) test is also used in order to test the stationarity of the variables.

3.4.3 Phillip Perron (PP) Test

Phillip Perron test is same as the ADF test where it is used to test the stationarity of the variables. It uses the non-parametric methods which can help the model suffers less from the distributional problem and help to control the high order serial correlation (Asmy, Rohilina, Hassama & Fouad, 2009). Thus, Phillip Perron test can avoid the loss of observation

and prevent from adding the lagged difference terms that implied by ADF test. Besides, the results of the PP test normally will same as the ADF test. According to Ibrahim and Musah (2014), Phillip Perron test will correct the serial correlation in the error term by modifying the test statistic directly. The null hypothesis (H_0) will be rejected if the p-value of the PP test is less than (1%, 5% and 10%) significance level. The null hypothesis that had been rejected stated that there was stationarity series among the variables.

3.4.4 Vector Error Correction Model (VECM)

A VEC model is also known as a restricted VAR that is made for use with nonstationary series that are to be cointegrated. According to Rahman et al. (2009) VECM is a full information maximum likelihood estimation model that allows testing the cointegration of the variables without to normalize the variables. VECM is able to identify the dynamic movement between the dependent and independent variables and it has the adjustments towards the long run equilibrium (Yunus, Mahyideen & Saidon, 2014). Thus, it can help to prevent from take the error in first step to the second step (Maysami, Howe & Hamzah, 2004). In short, VECM will be applied if there is cointegration among the variables in the long run equilibrium. If there is no cointegration occurs, the Granger causality test will be conducted without go through the VECM (Asari et al., 2011). Besides, VECM does not specific the prior assumption of the dependent and independent variables in the model. On the other hand, VECM itself is unable to provide the dynamic properties of the whole equation model among the sample period. So, the variance decomposition technique (VDC) and impulse response function (IRF) which from VAR will be conducted to examine the variables too (Yunus et al., 2014).

3.4.5 Cointegration Test

According to Nasir, Hassan, Nasir and Harun (2013), cointegration test is used to identify the long run relationship between dependent and independent variables. It helps to study the pairs of the variables are cointegrated or move jointly. Co-integrated is the stationarity in first difference and non stationarity at the level with the linear combination of the integrated variables $I(0)$. In order to detect the cointegration of the variables the Johansen Juselius or Johansen method can be used (Naik, 2013).

3.4.5.1 Johansen Juselius (JJ) test

Johansen Juselius test is a multivariate extension where it allows the data consists of more than one cointegrating vector. It is conducted to examine the cointegration relationship by using the VECM model (Ooi et al., 2009). Besides, Johansen Juselius test is used to identify the cointegration relationship between then variables in the long run (Bhunja & Ganguly, 2015). According to Ibrahim and Yusoff (2001), if the variable is non stationarity and not cointegrated, VAR model will be used to test the short run dynamic relationship among the variables.

$$X_t = A_0 + \sum_{j=1}^p B_j X_{t-j} + e_t$$

On the other hand, if the variable is cointegrated the error correction model will be applied.

$$\Delta X_t = A_0 + \sum_{j=1}^{p-1} \Gamma_j \Delta X_{t-j} + \Pi X_{t-p} + e_t$$

Cointegrating vectors helps to identify the long run relationship between dependent and independent variables. There have two test statistics which are trace and maximal eigenvalue in order to identify the number of cointegrating vectors. Based on the E-views output, we can compare the p-value and the significance level (1%, 5% and 10%) of trace statistic test. If the p-value is lesser than the significance level (1%, 5% and 10%) of trace

statistic test, we will reject the null hypothesis where there is cointegration among the variables.

3.4.6 Granger Causality test

Granger causality test is used to examine the causality relationship among all variables. Therefore, F statistics test is involved in order to test the significantly relationship about dependent variable and independent variables (Nasir et al., 2013). According to Asari et al. (2011) stated that if there is no cointegration Vector Error Correction Model (VECM), then granger causality can be used to test the casual linkage among variables. For example, 2 variables which are X_t and Y_t affect each other with distributed lags. Granger causality test is estimated by VAR model as below:

$$Y_t = a_0 + a_1Y_{t-1} + \dots + a_pY_{t-p} + b_1X_{t-1} + \dots + b_pX_{t-p} + u_t$$

$$X_t = c_0 + c_1X_{t-1} + \dots + c_pX_{t-p} + d_1Y_{t-1} + \dots + d_pY_{t-p} + v_t$$

Another example is explained in this way, B is said to be granger-caused by A if A helps to predict B. It is crucial to take note that statement “A granger causes B” does not imply that B is the effect or the result of A. Granger causality is used to measure precedence and information content. Granger causality used to recall the casual significant relationship among the variables.

Granger causality is used to recall the casual significant relationship among the variables.

3.4.7 Impulse Response Function

Vector Auto Regressions (VAR) had offered a new analytical which known as Impulse Response Function (IRF). Impulse response function same as variance decomposition that only can be applied in the short run dynamic analyze. In order for further estimation among the variables, it needs to generate impulse response function from VAR (Ibrahim & Yusoff, 2001). Impulse response function is designed to track the response when the system is shocked and impulse by the variables (Ronayne, 2011). Besides, impulse response function also can be used to detect the random interaction between the variables.

3.4.8 Variance Decomposition

Under Vector Error Correction Model (VECM), there is a short-run dynamic analyze known as Forecast Error Variance Decompositions (FEVD). Forecast Error Variance Decomposition is an econometric tool to detect the random relations between the variables (Herve, Chanmalai & Shen, 2011). Besides, Forecast Error Variance Decomposition also can measure the sensitivity to the changes in the forecasting variables that used. However, Variance Decomposition can investigate the relative contribution and attributable to innovation of the different variables (Ooi et al., 2009).

3.5 Diagnostic Checking

3.5.1 Test of Heteroscedasticity

Heteroscedasticity is that there is no constant in the variances of the error term. According to Gujarati and Porter (n.d.), heteroscedasticity is a

violation of assumption of the OLS. Even though heteroscedasticity problems happen, the OLS estimators are still unbiased and linear. The variances of the OLS estimators will become biased and inefficient. It will overestimate or underestimate the true variance of the error term. Thus, it affects the usual confidence intervals and hypothesis tests that depend on the T and F distribution becomes inaccurate and unreliable. Subsequently, the estimators will become inefficient (Gujarati & Porter, n.d.). ARCH model can be used to detect whether this econometric model does heteroscedasticity problem occur or not. According to Wang, Gelder, Vrijlingand and Ma (2005), ARCH model is a type of model and appropriate to examine and study the economic problem as heteroscedasticity which usually happen in time series data. So, the hypothesis testing will form in order to examine the heteroscedasticity problem in this economic model. Based on the E-view output, the p-value and significance level of the model will be compared. If the p-value which is prob. Chi-Square of the ARCH test is greater or more than the (1%, 5% and 10%) significance level of the model, it tends to do not reject the null hypothesis (H_0). Thus, it stated that these econometric models do not have any heteroscedasticity problem.

3.5.2 Test of Autocorrelation

According to Schink and Chiu (1966), autocorrelation is an economic problem that the disturbance of one period may affect an observation of the other period. Autocorrelation is the correlation between the series of observation that either order in time series data or cross sectional data (Gujarati & Porter, n.d.). Autocorrelation problem is same as heteroscedasticity where they are no longer BLUE. There are no longer efficient (minimum variance), hence the variances of the OLS estimators are biased and inefficient. There have 3 different methods to detect the presence of the autocorrelation problem of the model which are Durbin Watson d test, Durbin Watson h test and Breusch Godfrey (BG) test or

known as (LM test). The Durbin Watson d test and h test are applied to carry out the test for first order correlation. There have many assumptions when apply the d test such as the regression model cannot contain the lagged value of the dependent variable and there must be normally distributed error term and so on. Once the assumption does not follow the h test will used to test the regression model. Besides, the statisticians Breusch and Godfrey have developed a test which is Breusch Godfrey (BG) test or known as LM test to examine the autocorrelation problem that having a higher order of autocorrelation. Based on the E-view output of the Breusch Godfrey LM test, if the p-value which is prob.Chi-Square of the LM test is greater or more than the (1%, 5% and 10%) significance level of the model, it tends to do not reject the null hypothesis (H_0). Thus, it can conclude that these econometric models no have series correlation of any order problem.

3.5.3 Jarque Bera Test

Normality distribution of the error term is one of the assumptions in the regression model (Gujarati & Porter, n.d.). The normality is very important because it can help the test of significance and confidence interval become valid. If there is no normality of the error term in the regression model it tends to leads the incorrect of the p-value for the overall F test and T-test in each model's parameter. So, Jarque Bera test is introduced to examine the normality of the error term in the regression model. Jarque Bera test is based on the OLS residual and large sample test (Gujarati & Porter, n.d.).

$$\text{Jarque Bera Test} = \frac{n}{6} \left[S^2 + \frac{(K-3)^2}{4} \right]$$

The Jarque Bera test statistic that calculated will be compared and follows with the chi-square with 2 degree of freedom. Besides, based on the E-views output, we can determine the normality distributed of the error term. If the p-value is more than the (1%, 5% and 10%) significance level, we

will do not reject the null hypothesis and conclude that error term is normality distributed in the model.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

This study will make analysis on the time series and presentation on the estimated result about the effect of macroeconomic factors towards equity market return in Malaysia. Hence, it consist the result of descriptive statistic, unit root test, cointegration test, granger causality test, impulse response function, variance decomposition and diagnostic checking.

4.1 Descriptive statistics

Table 4.1: Summary of Descriptive Analysis of stock market return in Malaysia

	LOGEXC	LOGIPI	LOGCPI	LOGM2	IR
Mean	1.2617	4.5048	4.5160	13.3776	3.1317
Maximum	1.5315	4.8187	4.7176	14.2503	9.9820
Minimum	1.0946	3.9853	4.3202	12.5466	1.8230
Std. Dev.	0.0887	0.1975	0.1125	0.5492	1.1114

From the Table 4.1, it shows the summarized descriptive data related to Malaysia economy variables in log form. The average LOGEXC is 1.2617 among the period. The exchange rate touches the low of 1.0946 and the peak of 1.5315 from 1998 to 2014. The standard deviation is 0.0887 which shows low fluctuation in exchange rate compared with other variables.

The average of LOGIPI is 4.5048 while the minimum and maximum values are 3.9853 and 4.8187 respectively. The standard deviation is higher than the exchange rate which is 0.1975.

LOGCPI has a mean of 4.5160 and the standard deviation is 0.1125. The maximum value is 4.7176 while the minimum value is 4.3202.

The average of LOGM2 is 13.3776 which is the highest mean among all the independent variables. The highest value of LOGM2 is 14.2503 while the lowest value is 12.5466 during the period. The standard deviation is 0.5492 which shows low fluctuation in LOGM2 compare to IR.

IR has an average of 3.1317 while the minimum and the maximum values of IR are 1.8230 and 9.9820, which are observed in May 2009 and June 1998 respectively. From the minimum and maximum values we can know that the movement of interest rate is fluctuated in the period. Therefore the standard deviation is the highest among all variables, which is 1.1114.

4.2 Unit Root Test

Table 4.2.1: Result of Augmented Dickey-Fuller Unit Root Test

	Level Form		First Difference	
	Intercept	Trend and intercept	Intercept	Trend and intercept
Dependent Variable:				
LOGKLCI	-1.2186(0)	-3.1442(0)*	-12.1213(0)***	-12.0995(0)***
Independent Variables:				
LOGEXC	-3.1718(0)**	-4.2100(0)***	-20.3267(0)***	-20.2585(0)***
LOGIPI	-3.1024(12)**	-3.6446(12)**	-4.1691(11)***	-4.5255(11)***
LOGCPI	0.1706(1)	-2.8158(1)	-10.6380(0)***	-10.6256(0)***
LOGM2	0.7084(0)	-2.2148(0)	-12.0219(0)***	-12.0158(0)***
IR	-4.4894(11)***	-4.4660(11)***	-8.9529(4)***	-10.0085(4)***

Table 4.2.2: Result of Philips-Perron Unit Root Test

	Level Form		First Difference	
	Intercept	Trend and intercept	Intercept	Trend and intercept
Dependent Variable:				
LOGKLCI	-1.3562(5)	-3.6590(2)**	-12.2102(3)***	-12.1880(3)***
Independent Variables:				
LOGEXC	-3.1497(7)**	-4.2279(1)***	-21.5277(13)***	-21.4647(13)***
LOGIPI	-1.4551(18)	-3.9968(5)**	-30.7903(7)***	-31.1250(7)***
LOGCPI	-0.1691(2)	-2.5126(3)	-10.6710(2)***	-10.6558(2)***
LOGM2	0.5128(5)	-2.3186(5)	-12.0735(3)***	-12.0708(3)***
IR	-2.8665(12)*	-2.6024(12)	-9.1678(27)***	-9.4171(32)***

Note: *, **, *** denotes the rejection of null hypothesis at 10%, 5% and 1% significance levels. Number in parentheses is the number of lags. Lag lengths for the ADF unit root test are based on the Schwarz information criterion. While, Philips-Perron unit root test is based on the Newey-West estimate by using the Barlett Kernel. The unit root test includes a constant and linear time trend. The null hypothesis under ADF and PP test is the presence of the unit root.

According to Table 4.2.1 and Table 4.2.2, there is enough evidence to reject H_0 since all the variables' p-values are lesser than significance level of 10%, 5% and 1%. It is concluded that variables are stationary at I (1) and there is no unit root in the regression model.

4.3 Cointegration Test

Table 4.3.1: Result of Cointegration Test

H_0	Trace Statistics	Critical Value	Max-Eigen Statistics	Critical Value
None	148.4490***	95.75366	70.3019***	40.0775
At most 1	78.14709***	69.81889	33.44017*	33.87687
At most 2	44.70692*	47.85613	23.60006	27.58434
At most 3	21.10686	29.79707	11.68069	21.13162
At most 4	9.426164	15.49471	6.407523	14.26460

Note: *, **, *** denote rejection of null hypothesis at 10%, 5% and 1% significance level.

Table 4.3.1 shows the result of cointegration test. The result shows that trace statistics is rejected at $r=2$ at 10% significance level while Max-Eigen statistics is rejected at $r=1$ at 10% significance level. Trace test is cointegrated in $r=2$ while Max-Eigen is cointegrated in $r=1$. Therefore, this study concludes that there is at least one cointegrating relations under the null hypothesis.

4.4 Granger Causality Test

Table 4.4.1: Result of Granger Causality Test

	LOGKLCI	LOGEXC	LOGIPI	LOGCPI	LOGM2	IR
LOGKLCI	-	3.3947	6.0001***	39.2789	15.8165**	24.3412***
LOGEXC	7.7978	-	-	-	-	-
LOGIPI	15.8096**	-	-	-	-	-
LOGCPI	9.9754	-	-	-	-	-
LOGM2	11.5024	-	-	-	-	-
IR	27.1947***	-	-	-	-	-

Note: *, **, *** denotes rejection of null hypothesis at 10%, 5%, and 1% significance level.

According to Table 4.4.1, the result shows that LOGIPI, LOGM2 and IR are granger cause LOGKLCI at 5% and 1% significance level. The LOGEXC, LOGCPI is no granger cause LOGKLCI. However, the result shows that LOGKLCI granger cause LOGIPI and IR at 5% and 1% significance level. This

study also found that LOGKLCI does not granger cause LOGEXC, LOGCPI and LOGM2.

4.5 Impulse Response Function

Figure 4.5.1: Response of LOGKLCI to LOGKLCI

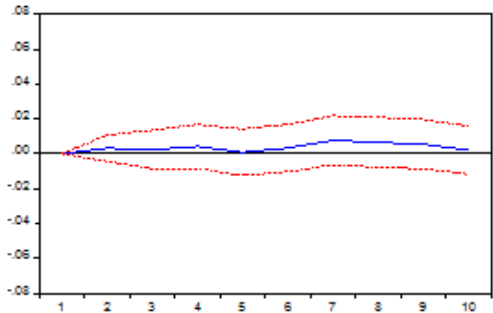


Figure 4.5.2: Response of LOGKLCI to IR

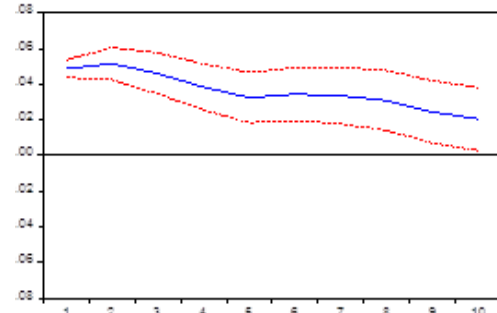


Figure 4.5.3: Response of LOGKLCI to LOGCPI

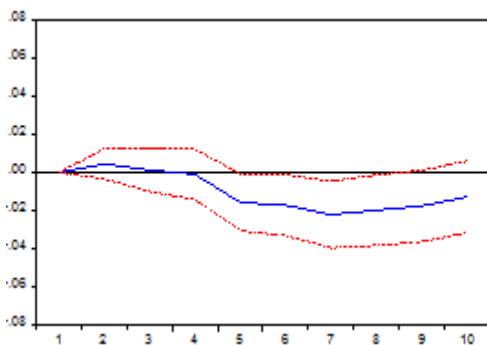


Figure 4.5.4: Response of LOGKLCI to LOGEXC

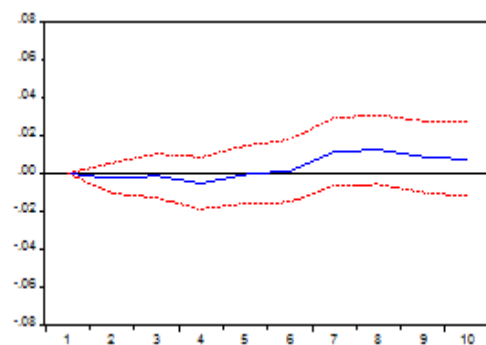


Figure 4.5.5: Response of LOGKLCI to LOGIPI

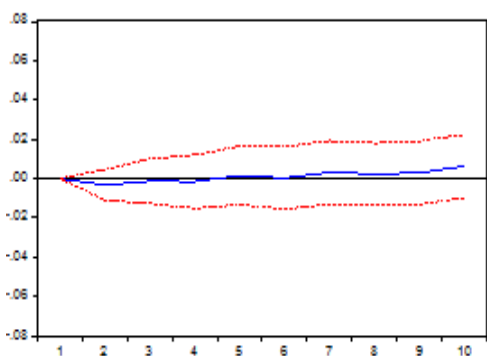
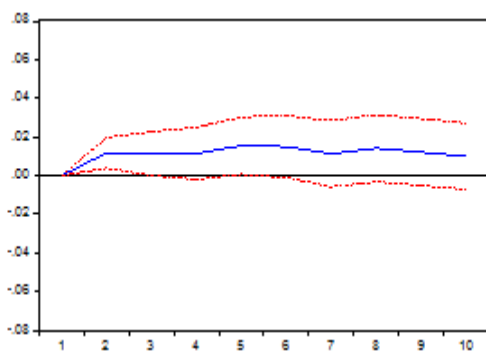


Figure 4.5.6: Response of LOGKLCI to LOGM2



The Figure 4.5.1 shows how LOGKLCI is expected to change following a unit of impulse from LOGKLCI. The respond of LOGKLCI to its own unexpected shock is positive at every time. The Figure 4.5.2 shows how LOGKLCI is expected to

change following a unit of impulse from IR. The every respond of LOGKLCI to IR is positive. The value is right above the line zero.

The Figure 4.5.3 shows how LOGKLCI is expected to change following a unit of impulse from LOGCPI. A one standard deviation shock to LOGCPI causes LOGKLCI to decrease overtime. The response of LOGKLCI become negative started from the middle stage. The Figure 4.5.4 shows how LOGKLCI responds when receive the impulse from LOGEXC. LOGKLCI has a negative respond to LOGEXC in early stage, and become positive in the late period.

The Figure 4.5.5 shows how LOGKLCI is expected to change following a unit of impulse from LOGIPI. The response of LOGKLCI does not have an obvious fluctuation. LOGKLCI is not much affected by the impulse since the response is near to zero. The Figure 4.5.6 shows how LOGKLCI is expected to change following a unit of impulse from LOGM2. The response of LOGKLCI is all positive and does not fluctuate much.

4.6 Variance Decomposition

Table 4.6.1: Results on Variance Decomposition of LOGKLCI towards LOGEXC, LOGIPI, LOGCPI, LOGM2 and IR.

Period	LOGKLCI	LOGEXC	LOGIPI	LOGCPI	LOGM2	IR
1	100.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	94.8353	0.0126	0.9579	0.1600	3.4367	0.5974
3	90.1549	0.1249	1.5642	0.2211	6.0393	1.8957
4	84.0269	0.1277	1.7650	0.4978	8.0470	5.5355
5	77.2020	0.1066	2.1333	4.2087	9.6129	6.7365
6	72.4604	0.0876	2.2894	6.9655	9.6108	8.5862
7	68.6905	0.1881	2.3463	9.6172	8.8833	10.2746
8	64.0466	0.3281	2.1043	12.124	7.8531	13.5437
9	60.4267	0.4647	2.2775	14.540	7.3175	14.9732
10	58.3730	0.6214	2.2273	15.892	6.9093	15.9775

According to Table 4.6.1, Malaysia stock return itself illustrates its relative exogeneity with over 94.84% of own variance being explained by their own innovation. Secondly, it is proven that money supply influences the Malaysia's

stock market return with over 3.3438% in period 2. The most impact towards Malaysia's stock market return caused by money supply is in period 5, which is 9.6129%.

Besides, CPI has a small shock towards KLCI in the first 4 periods which is less than 1%. The impacts towards KLCI become larger in the long run which is from period 5 to 10. The impacts of each independent variable to stock market return are getting larger as the period is increasing. It can be concluded that the independent variables influence dependent variable spectacularly in the long run.

4.7 Diagnostic Checking

Table 4.7.1: Result on the Diagnostic Checking

Diagnostic Checking	Test Statistics
White Heteroscedasticity	2000.026 (8)
Autocorrelation LM	44.60650 (24)
Normality	6.0965

Note: *, **, *** denotes rejection of null hypothesis at 10%, 5%, and 1% significance level.

Refer to Table 4.7.1, the regression model is not suffered from heteroscedasticity and autocorrelation problem. Other than that, the error term is normally distributed.

4.8 Discussion on Major Findings

According to the results, Granger causality test and VECM show that LOGIPI, LOGM2 and IR are granger cause LOGKLCI at 10%, 5% and 1% significance level respectively. Ozbay (2009) showed that GDP does not Granger cause stock return in Turkey which is not consistent with this study. There is no causal relationship between stock market and industrial production, in the other words, the variables cannot be used as leading indicators to estimate each other. While in the research of Teker and Alp (2014) investigated 4 countries which are Turkey,

Brazil, China and Hungary and found that only 3-month T-bill rates in Brazil are granger cause the IBOV Index. The other countries' 3-month T-bill rates do not granger cause their respective stock market indexes. In the study of Zakaria and Shamsuddin (2012) examined the relationship between stock market volatility and macroeconomics volatility in Malaysia as well. Hence, the money supply (M2) and stock return does not granger cause each other.

LOGEXC and LOGCPI does not granger cause LOGKLCI based on the results. According to Ogunmuyiwa and Segun (2015) found that inflation using Consumer Price Index as proxy does granger cause NSE index, however, the result is a weak unidirectional causality since it is at 10% significance level. Ogunmuyiwa and Segun (2015) also argued that inflation is not strong enough to determine movements in stock market variables in Nigeria. Ozbay (2009) found that exchange rate does not granger cause stock return in Turkey and the result is inconsistent with the study. Ozbay (2009) stated that exchange rate should be an important factor to be considered in investment, since the emerging and developed markets provide many opportunities for investment for investors which increase the exchange rate risk. Nevertheless, many empirical studies also found that the direction of causality is not weighty.

From Johansen cointegration test, the result proved that there was evidence that three co-integrating relationship vector in trace while in Max-Eigen Statistics shows only two co-integrating relationship vector. This study rejected the hypothesis of zero cointegration vectors at 1% significance level. Therefore, it shows that there is long-run equilibrium relationship between stock market return in Malaysia and all the independent variables. The result is consistent with Raymond (2009) where there is a long term relationship between the Jamaica Stock Exchange Index and 5 variables where four of the variables tested are similar to this study, which are interest rate, inflation rate, exchange rate and M2.

Other than that, impulse response functions which analyze the short run dynamic relation between the stock market return in Malaysia and the macroeconomic factors. The result indicates that LOGKLCI, IR, and LOGM2 have positive

impacts on LOGKLCI. While the response of LOGKLCI to LOGCPI shows a clear negative impact especially in the long term. LOGEXC and LOGIPI have rising trends where the impacts rise from negative to positive in the long run.

According to the results, in the variance decomposition of LOGKLCI, its own shocks contribute 94.84% in period 2 where other variables LOGEXC, LOGIPI, LOGCPI, LOGM2 and IR constituting 0.01%, 0.96%, 0.16%, 3.44% and 0.60% respectively. Own shocks continue to decline for LOGKLCI to 58.37% in period 10. While for the macroeconomic factors, own shocks increase continuously the longer the period.

In addition, diagnostic checking is performed to check the autocorrelation, heteroscedasticity and normality problem in this study. This regression model does not have heteroscedasticity and autocorrelation problem and the error term is normally distributed as well.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

This chapter includes the implications of the study, limitation and recommendations and conclusion.

5.1 Implications of the Study

In this study, the results proved that variables such as consumer prices index, interest rate, industrial production index, exchange rate, money supply are having long run equilibrium relationship with stock return in Malaysia. Besides, industrial production index, money supply and interest rate are found to granger cause stock market return in Malaysia. The results shown are important especially to the stock market investors as they can use this information in making decision and can forecast the movement of the stock market in Malaysia. Every variable adopted in this study plays a crucial role in influencing the stock market in Malaysia (KLCD). Hence, this finding contributes to policy makers and stock market participants in a better understanding on how the equity market in Malaysia can be affected by these variables.

The result showed that exchange rate (RM/ \$) affects the stock market return in the long run. When the Malaysia (RM) Ringgit appreciates which means the dollar depreciates, the domestic product will become more expensive compared to the foreign product, hence, it will eventually lead to import increases and export decreases. As a result, stock return (KLCD) reduces. Decisions should be made carefully on the implementation of expansionary or contractionary monetary policies for the purpose to enhance performance in the stock market. Coupled with

that, changes in money supply will affect the exchange rate and eventually influence the stock market as well (Dimitrova, 2005).

Furthermore, the industrial production index has been proved to granger cause stock return in Malaysia. It can be simply explained in that when production increases, revenues and benefits for the firms will be higher, hence, increase in the volume of cash flows will cause the stock return to rise as well.

In this study, it is concluded that there is long run relationship between consumer price index and stock return in Malaysia. Inflation is also meant that decline in the value of money. When there is a decrease in real value of money, it will lead the purchasing power in the medium of exchange to reduce as well. When the general price level increases, the goods and services become more expensive for the consumers, hence they will buy fewer units of them. When there is inflation in the country, the cost of living will rise as well because the consumers might consume less on goods and services that become more expensive for them. Economic activities will be reduced as well. Investors would choose to invest less and sell out their shares that cause the share price to reduce. Therefore, to minimize the negative impacts brought by inflation, it is recommended for the government to monitor the economic condition from time to time and also to balance the money supply in the market. When it is expected for the inflation to occur, actions should be taken such as restriction of the money supply in the market.

In addition, according to the result, it can be seen that money supply does granger cause stock return in Malaysia. Investment activities will be raised when money supply increases because investors tend to have more funds. Therefore, it improves the economic activities and performance as well. In order to increase money supply, required reserve should be reduced so that more loans can be lent out to the public. In the open market operations, government can also purchase treasury securities to increase money supply. Government should put more caution in implementing monetary policy. The changes in money supply will affect the changes in stock market as well.

Besides, it is found that interest rate does granger cause stock return in Malaysia. When the interest rate increases, demand for deposits will be higher and there will be less investment because the cost of borrowing is higher, subsequently it reduces the stock return in market. In other words, it is preferably to deposit money in the financial institutions in order to gain interest income rather than to make investment in the stock market. Central Bank takes the decision to control the interest rate. The decision will affect the performance of Malaysia stock market. When the discount rate is lowered down by central bank, cost of borrowing reduces as well and it will improve the economic activities such as investment in the market.

5.2 Limitations

This study does not provide information on the impacts of factors on stock return on other countries. This study only makes investigation in Malaysia. The findings and results presented are only useful and helpful for the Malaysia investor and policy maker in making decision as the study is focus only in Malaysia. Different countries have different status, culture, background, political factors and strength in the industry field. Coupled with that, different countries have different pattern movement and characteristics of the data a used. Therefore, other countries such as China, Japan and United States are not advised to adopt this research.

5.3 Recommendations

It is recommended to include other countries such as ASEAN countries, Japan and China in this research. Therefore, it would be useful for other countries to refer to the study to adopt the case into their respective countries' policies. Also, it would be helpful as well for ASEAN countries' investors and policy makers in making decisions. Therefore, investors would have a clearer view and enhance understanding on those impacts between countries as well.

5.4 Conclusion

In a nutshell, it is concluded that the result under this study shows that industrial production index, money supply and interest do granger cause Malaysia's stock return. Other than that, all the macroeconomic variables are having long run equilibrium relationship with Malaysia's stock market return. Besides, some limitations and recommendations have been discussed in order for the future researchers to make improvement and contribution in future research and study. Findings on this study are useful in enhancing better understanding on the impact of these macroeconomic factors on stock return in market.

REFERENCES

- Acikalin, S., Aktas, R., & Unal, S. (2008). Relationships between stock markets and macroeconomic variables: an empirical analysis of the Istanbul Stock Exchange. *Investment Management and Financial Innovations*, 5(1), 8-16.
- Adjasi, C., Harvey, S. K., & Agyapong, D. (2008). Effect of Exchange Rate Volatility on the Ghana Exchange. *African Journal of Accounting, Economics, Finance and Banking Research*, 3(3), 28-47.
- Adrangi, B., Chatrath, A., & Raffiee, K. (1999). Inflation, Output, and Stock Prices: Evidence from Two Major Emerging Markets. *Journals of Economics and Finance*, 23(3), 266-278.
- Alam, Z., & Rashid, K. (2014). Time Series Analysis of the Relationship between Macroeconomic Factors and the Stock Market Returns in Pakistan. *Journal of Yasar University*, 9(36), 6261-6380.
- Alam, M. M., & Uddin, M. G. S. (2009). Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries. *International Journal of Business and Management*, 4(3), 43-51.
- Al-Zararee, A. N., & Ananzeh, I. E. N. (2014). The Relationship between Macroeconomic Variables and Stock Market Returns: A Case of Jordan for the Period 1993-2013. *International Journal of Business and Social Science*, 5(5), 186-194.
- Angabini, A., & Wasiuzzaman, S. (2011). GARCH Models and the Financial Crisis-A Study of the Malaysian Stock Market. *The International Journal of Applied Economics and Finance*, 5(3), 226-236.
- Asari, F. F. A. H., Baharuddin, N. S., Jusoh, N., Mohamad, Z., Shamsudin, N., & Jusoff, K. (2011). A Vector Error Correction Model (VECM) Approach in Explaining the Relationship Between Interest Rate and Inflation Towards Exchange Rate Volatility in Malaysia. *World Applied Sciences Journal*, 12(3), 49-56.
- Aslam, W. (2014). Relationship Between Stock Market Volatility and Exchange Rate: A Study of KSE. *International Journal of Current Research*, 6(3), 5800-5804.
- Asmy, M., Rohilina, W., Hassama, A., & Fouad, M. (2009). Effects of Macroeconomic Variables on Stock Prices in Malaysia: An Approach of Error Correction Model. *Munich Personal RePEc Archive*, 1-33.
- Barnor, C. (2014). *The effect of macroeconomic variables on stock market returns in Ghana*.

- Bhargava, V., & Konku, D. (n.d.). *Impact of Exchange Rate Fluctuations on US Stock Market Returns*.
- Bhattacharya, B., & Mukherjee, J. (n.d.). Causal Relationship Between Stock Market And Exchange Rate, Foreign Exchange Reserves and Value of Trade Balance: A Case Study For India. 1-24.
- Bhunia, A., & Ganguly, S. (2015). Cointegration Influence of Macroeconomic Indicators on Stock Market Index in India. *American Journal of Theoretical and Applied Business*, 1(1), 1-5.
- Boudoukh, J., & Richardson, M. (1993). Stock Returns and Inflation: A Long-Horizon Perspective. *The American Economic Review*, 83(5), 1346-1355.
- Bryan, M. F., & Cecchetti, S. G. (1993). The Consumer Price Index as a Measure of Inflation. *National Bureau of Economic Research*, 29(4), 1-23.
- Chen, N.-F., Roll, R., & Ross, S. (1986). Economic Forces and the Stock Market. *The Journal of Business*, 59(3), 383-403.
- Cochrane, J. H. (1991). Production-Based Asset Pricing and the Link Between Stock Returns and Economic Fluctuations. *The Journal of Finance*, 46(1), 209-237.
- Dimitrova, D. (2005). The Relationship between Exchange Rates and Stock Prices: Studied in a Multivariate Model. *Issues in Political Economy*, 14.
- Erdogan, E., & Ozlale, U. (2005). Effects of Macroeconomic Dynamics On Stock Returns: Case of Turkish Stock Exchange Market. *Journal of Economic Corporation*, 26(2), 69-90.
- Fama, E. F. (1981). Stock Returns, Real Activity, Inflation, and Money. *The American Economic Review*, 71(4), 545-565.
- Fama, E. F., & Schwert, G. W. (1977). Asset returns and inflation. *Journal of Financial Economics*, 5, 115-146.
- FTSE Bursa Malaysia KLCI. (2011, August 12). Features of FTSE Bursa Malaysia, Selection of FTSE Bursa Malaysia KLCI Constituents and Calculation and Review of the FTSE Bursa Malaysia KLCI. Retrieved from http://www.bursamalaysia.com/website/bm/market_information/fbm_klci.htm
- Gan, C., Lee, M., Yong, H. H. A., & Zhang, J. (2006). Macroeconomic Variables and Stock Market Interactions: New Zealand Evidence. *Investment Management and Financial Innovations*, 3(4), 89-101.

- Geske, R., & Roll, R. (1983). The Fiscal and monetary linkage between stock returns and inflation. *The Journal of Finance*, 38(1), 1-33.
- Gujarati, D. N., & Porter, D. C. (n.d.). *Essentials of econometrics* (4th ed.). New York, United States: Douglas Reiner.
- Gupta, N. (2011). Asymmetry in Asia Pacific Stock Markets. *QUEST-Journal of Management and Research*, 2(1), 33-42.
- Herve, D. B. G., Chanmalai, B., & Shen, Y. (2011). The Study of Causal Relationship between Stock Market Indices and Macroeconomic Variables in Cote d'Ivoire: Evidence from Error-Correction Models and Granger Causality Test. *International Journal of Business and Management*, 6(12), 146-169.
- Homa, K. E., & Jaffee, D. M. (1971). The Supply of Money and Common Stock Prices. *The Journal of Finance*, XXVI (5), 1045-1066.
- Humpe, A., & Macmillan, P. (2007). Can macroeconomic variables explain long term stock market movements? A comparison of the US and Japan. *Centre For Dynamic Macroeconomic Analysis*, 1-23.
- Ibrahim, M., & Musah, A. (2014). Causality and Cointegration Analysis: Evidence from the Brazilian Stock Market. *European Journal of Business and Management*, 6(3), 130-142.
- Ibrahim, M. H. (2006). Integration or Segmentation of the Malaysian Equity Market: An Analysis of Pre- and Post-Capital Controls. *Journal of the Asia Pacific Economy*, 11(4), 424-443.
- Ibrahim, M. H., & Yusoff, W. S. W. (2001). Macroeconomic Variables, Exchange Rate and Stock Price: A Malaysian Perspective. *Journal of Economics and Management*, 9(2), 141-163.
- Ibrahim, T. M., & Agbaje, O. M. (2013). The relationship between stock return and inflation in Nigeria. *European Scientific Journal*, 9(4), 146-157.
- Jensen, G. R., Mercer, J. M., & Johnson, R. R. (1996). Business Conditions, Monetary Policy and Expected Security Returns. *Journal of Financial Economics*, 40, 213-237.
- Kaul, G. (1987). Stock returns and inflation: The role of the monetary sector. *Journal of Financial Economics*, 18(2), 253-276.
- Khan, Z., Khan, S., Rukh, L., Imdadullah, & Rehman, W. U. (2012). Impact of Interest Rate, Exchange Rate and Inflation on Stock Returns of KSE 100 Index. *International Journal of Economics and Research*, 3(5), 142-155.

- Kira, A. R. (2013). The Factors Affecting Gross Domestic Product (GDP) in Developing Countries: The Case of Tanzania. *European Journal of Business and Management*, 5(4), 148-158.
- Kutan, A. M., & Aksoy, T. (2003). Public Information Arrival and the Fisher Effect in Emerging Markets: Evidence from Stock and Bond Markets in Turkey. *Journal of Financial Services Research*, 23(3), 225-239.
- Lee, B. S. (1992). Causal Relations Among Stock Returns, Interest Rates, Real Activity, and Inflation. *The Journal of Finance*, 47(4), 1591-1603.
- Lee, S. R., Tang, D. P., & Wong, K. M. (2000). Stock returns during the German hyperinflation. *The Quarterly Review of Economics and Finance*, 40(3), 375-386.
- Li, S.-F., Zhu, H.-M., & Yu, K. (2012). Oil prices and stock market in China: A sector analysis using panel cointegration with multiple breaks. *Energy Economics*, 34(6), 1951-1958.
- Li, Y. & Huang, L. (2008). On the relationship between stock return and exchange rate: evidence on China, *The Business School, Loughborough University, UK*.
- Liu, M., & Shrestha, K. (2008). Analysis of the long term relationship between Macro-economic variables and the Chinese stock market using Heteroscedastic cointegration. *Journal of Management Finance*, 34(11), 744-755.
- Malkiel, B. (2003). The Efficient Market Hypothesis and Its Critics. *Journal of Economic Perspectives*, 17(1), 59-82.
- Maysami, R. C., & Koh, T. S. (2000). A vector error correction model of the Singapore stock market. *International Review of Economics & Finance*, 9(1), 79-96.
- Maysami, R. C., Howe, L. C., & Hamzah, M. A. (2004). Relationship between Macroeconomic Variables and Stock Market Indices: Cointegration Evidence from Stock Exchange of Singapore's All-S Sector Indices. *Jurnal Pengurusan*, 24(1), 47-77.
- Moya-Mart ínez, P., Ferrer-Lapena, R., & Escribano-Sotos, F. (2015). Interest rate changes and stock returns in Spain: A wavelet analysis. *BRQ Business Research Quarterly*, (18), 95-110.
- MSCI (2010). Is There a Link between GDP Growth and Equity Returns? *MSCI Barra Research Paper*, No. 2010-18.

- Muhammad, N. M. N., & Rahman, N. M. N. A. (2010). Efficient Market Hypothesis and Market Anomaly: Evidence from Day-of-the Week Effect of Malaysian Exchange. *International Journal of Economics and Finance*, 2(2), 35-42.
- Mukherjee, T., & Naka, A. (1995). Dynamic Linkage Between Macroeconomic Variables and the Japanese Stock Market: An Application of a Vector Error Correction Model. *The Journal of Financial Research* 18(2), 223-237.
- Naik, P. K. (2013). Does Stock Market Respond to Economic Fundamentals? Time-series Analysis from Indian Data. *Journal of Applied Economics and Business Research*, 3(1), 34-50.
- Nantwi, O., Victor, & Kuwornu, J. K. M. (2011). Analyzing the effect of macroeconomic variables on stock market returns: Evidence from Ghana. *Journal of Economics and International Finance*, 3(11), 605-615.
- Nasir, N. M., Hassan, N. M., Nasir, Z. A., & Harun, M. F. M. (2013). Macroeconomic Factors as the Determinants of Stock Market Return in Malaysia: Multivariate Cointegration and Causality Analysis. *Terengganu International Finance and Economics Journal*, 3(1), 38-49.
- Nath, G. C., & Samanta, G. P. (2003). Relationship Between Exchange Rate and Stock Prices in India –An Empirical Analysis. *SSRN Electronic Journal*, 1-8.
- Nishat, M., & Shaheen, R. (2004). Macroeconomic Factors and Pakistani Equity Market. *The Pakistan Development Review*, 43(4), 610-637.
- Ogunmuyiwa, & Segun, M. (2015). Does Inflation Granger Cause Stock Market Performance in Nigeria? *Developing Country Studies*, 5(5), 139-142.
- Ooi, A. Y., Wafa, S. A. W. S. K., Lajuni, N., & Ghazali, M. F. (2009). Causality between Exchange Rates and Stock Prices: Evidence from Malaysia and Thailand. *International Journal of Business and Management*, 4(3), 86-98.
- Ouma, W. N., & Muriu, D. P. (2014). The Impact of Macroeconomic Variables on Stock Market Returns in Kenya. *International Journal of Business and Commerce*, 3(11), 1-31.
- Ozbay, E. (2009). The Relationship between Stock Returns and Macroeconomic Factors: Evidence from Turkey. 1-63.
- Paramati, S. R., & Gupta, R. (2013). An Empirical Relationship between Exchange Rates, Interest Rates and Stock Returns. *European Journal of Economics, Finance and Administrative Sciences*, (56), 169-179.

- Patel, S. (2012). The effect of Macroeconomic Determinants on the Performance of the Indian Stock Market. *NMIMS Management Review*, 22(1), 117-127.
- Premaratne, G., & Balasubramanian, L. (2003). Stock Market Volatility: Examining North America, Europe and Asia. *National University of Singapore, Economics Working Paper*.
- Rahman, S. M. B. A., Hatta, S. A. B. M., & Ismail, H. F. B. (2013). Macroeconomic Variables of Stock Prices (KLCI). *International Conference on Financial Criminology*, 233-249.
- Rahman, A. A., Sidek, N. Z. M., & Tafri, F. H. (2009). Macroeconomic determinants of Malaysian stock market. *African Journal of Business Management*, 3(3), 95-106.
- Ratanapakorn, O., & Sharma, S. C. (2007). Dynamics analysis between the US Stock Return and the Macroeconomics Variables. *Applied Financial Economics*, 17(5), 369-377.
- Ratneswary, R., & Rasiah, V. (2010). Macroeconomic Activity and the Malaysian Stock Market: Empirical Evidence of Dynamic Relations. *The International Journal of Business and Finance Research*, 4(2), 59-69.
- Raymond, K. (2009). Is There a Long Run Relationship Between Stock Prices and Monetary Variables? Evidence from Jamaica. *Bank of Jamaica*, 1-21.
- Reilly, F. (1997). The Impact of Inflation on ROE, Growth and Stock Prices. *Financial Services Review*, 6(1), 3-17.
- Ritter, J. R. (2005). Economic growth and equity return. *Pacific-Basin Finance Journal*, 13, 489-503.
- Rjoub, H., Türsoy, T., & Günsel, N. (2009). The effects of macroeconomic factors on stock returns: Istanbul Stock Market. *Studies in Economics and Finance*, 26(1), 36-45.
- Ronayne, D. (2011). Which Impulse Response Function? *University of Warwick*. 1-47.
- Schink, W. A., & Chiu, J. S. Y. (1966). A Simulation Study of Effects of Multicollinearity and Autocorrelation on Estimates of Parameters. *The Journal of Financial and Quantitative Analysis*, 1(2), 36-67.
- Shiller, R. J. (2003). From Efficient Markets Theory to Behavioral Finance. *Journal of Economic Perspectives*, 17(1), 83-104.
- Shubita, M. F., & Al-Sharkas, A. A. (2010). A Study of Size Effect And Macroeconomics Factors In New York Stock Exchange Stock Returns. *Applied Econometrics and International Development*, 10(2), 137-151.

- Singh, L. K. (2010). Whither Efficient Markets? Efficient Market Theory and Behavioral Finance. *The Finance Professionals' Post*. Retrieved from <http://post.nyssa.org/nyssa-news/2010/05/whither-efficient-markets-efficient-market-theory-and-behavioral-finance.html>
- Singh, T., Mehta, S., & Varsha, M. S. (2011). Macroeconomic factors and stock returns: Evidence from Taiwan. *Journal of Economics and International Finance*, 2(4), 217-227.
- Subair, K. & Salihu, O.M. (2013). *Exchange Rate Volatility and the Stock Market: The Nigerian Experience*.
- Talla, J. T. (2013). Impact of Macroeconomic Variables on the Stock Market Prices of the Stockholm Stock Exchange (OMXS30). *Jönköping International Business School*, 1-48.
- Tang, H.P., Habibullah, M.S., & Pua, C.H. (2007). Stock market and economic growth in selected Asian countries.
- Teker, D. L., & Alp, E. A. (2014). Granger Causality Relation Between Interest Rates and Stock Markets: Evidence From Emerging Markets. *European Journal of Business and Social Sciences*, 2(10), 63-73.
- Thornton, D. L. (2000). Money in a Theory of Exchange. *Federal Reserve Bank of St. Louis Review*, 82, 35-60.
- Trading Economics. (2016). Retrieved from <http://www.tradingeconomics.com/malaysia/inflation-cpi>
- Tripathi, V., & Kumar, A. (2014). Relationship between Inflation and Stock Returns-Evidence from BRICS markets using Panel Cointegration Test. *International Journal of Accounting and Finance Reporting*, 4(2), 647-658.
- Wang, W., Gelder, P. H. A. J. M. V., Vrijling, J. K., & Ma, J. (2005). Testing and modeling autoregressive conditional heteroskedasticity of streamflow processes. *Nonlinear Processes in Geophysics, European Geosciences Union (EGU)*, 12(1), 55-66.
- Yunus, M. M., Mahyideen, J. M., & Saidon, R. (2014). Influences of Macroeconomic Variables on Stock Prices in Malaysia. *International Conference on Postgraduate Research*, 399-416.
- Zakaria, Z., & Shamsuddin, S. (2012). Empirical Evidence on the Relationship between Stock Market Volatility and Macroeconomics Volatility in Malaysia. *Journal of Business Studies Quarterly*, 4(2), 61-71.