IMPACT OF MACROECONOMIC VARIABLES ON STOCK MARKET DEVELOPMENT: EVIDENCE FROM MALAYSIA

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DECLARATION

We hereby declare that:

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

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

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

(4) The word count of this research report is **16,982** words.

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DEDICATION

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Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF GRAPH

LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller
ARDL	Autoregressive Distributed Lag
BLUE	Best Linear Unbiased Efficient Estimator
BNM	Bank Negara Malaysia
BSMD	Bahraini Stock Market Development
CAPM	Capital Asset Pricing Model
CME	Chicago Mercantile Exchange
CPI	Consumer Price Index
ECM	Error Correction Mechanisms
EMH	Efficient Market Hypothesis
et al.	And others
E-views 6	Econometric views 6
GARCH	Generalized Autoregressive Conditional Heteroscedasticity
INF	Inflation Rate
ISE	Islamabad Stock Exchange
ISO	International Organization for Standardization
JB	Jarque-Bera

KLCI	Kuala Lumpur Composite Index
KLSE	Kuala Lumpur Stock Exchange
KSE	Karachi Stock Exchange
LSE	Lahore Stock Exchange
M1	Money Supply Category 1
M2	Money Supply Category 2
M3	Money Supply Category 3
ML	Maximum Likelihood
MLRM	Multiple Linear Regression Model
MSMD	Malaysia Stock Market Development
MYR	Malaysian Ringgit
OLS	Ordinary Least Squares
OTC	Over-The-Counter
PP	Phillips-Perron
PPP	Purchasing Power Parity
REER	Real Effective Exchange Rate
RM	Ringgit Malaysia
RRR	Required Reserves Ratio
UK	United Kingdom
US	United States
VAR	Vector Autoregressive
VECM	Vector Error Correction Model

LIST OF APPENDICES

ABSTRACT

This paper investigated on the impacts of macroeconomic variables on the stock market development in Malaysia from 1980 to 2013 containing a total number of 397 monthly data observations. In order to examine the effects of these macroeconomic variables of the stock market development, a series of empirical tests namely the OLS regression, Normality Test, Unit Root, Granger Causality, Variance Decomposition and the Impulse Response Function. It was determined from the OLS regression that financial crisis being our dummy variable signifies a negative relationship with Malaysia Stock Market Development (MSMD) whereas inflation rate (INF), money supply (M2) and Real Effective Exchange Rate (REER) were determined to have a positive relationship with Malaysia Stock Market Development (MSMD). The findings from the Normality Jarque-Bera (JB) Test indicated that the model is significant in a whole and the error terms are normally distributed. The result determined from Unit Root Test has shown that the variables are stationary at the first difference. Additionally, Granger Causality and Johansen Co-integration Tests have also been executed to determine the short and long run dynamic linkages of variables. Lastly, Variance Decomposition has determined that inflation rate (INF) possesses greater impacts on Malaysia Stock Market Development (MSMD) in short run compared to other macro-variables.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

Stock market development can be measured and indicated using stock market efficiency, stock market volatility, stock market returns and others. In fact, stock market volatility will normally affect the investment decisions made by investors in order to gain higher returns in their investments. By the way, previous researchers stated that there are lots of macroeconomic determinants which will affect the stock market development. In the past, people have no knowledge about how the stock market works and the reasons which contribute to the stock market fluctuations.

In recent years, the liberalization of financial markets has caused the stock market to expose to various sources of risks (Kasman, Vardar & Tunc, 2011). Previous researchers found that there are relationships between macroeconomic variables and stock market returns. Besides that, there is one hot issue nowadays in which it is regarding whether money supply and stock market returns possess uni-directional or bi-directional relationship (Zafar, Rafique & Abbas, 2011). Some of the researchers claimed that although there are changes in macroeconomic variables, it doesn't mean that there is causal relationship between money supply and stock market development. In this research, Money Supply Category 2 (M2) will be used as a proxy for money supply.

Besides that, Walid, Chaker, Masood and Fry (2011) discovered that the changes of foreign exchange rate plays a major role in determining the switching behavior of investors between stable and non-stable periods in emerging stock market. In this research, Real Effective Exchange Rate (REER) will be used. It can further be explained by when REER increases, stock price will decrease as well because exporters and importers need to bear higher distribution cost for their products in which it adversely affects the stock market performance. Therefore, it is demonstrated that Real Effective Exchange Rate (REER) is negatively related to stock market development. When there are changes in macroeconomic variables, their effects will contribute to another scene which is associated with stock market volatility. It means the stock market may fluctuate due to it is sensitive to the changes in macroeconomic variables. Therefore, most of the investors will think carefully in order to make wise investment decisions especially when the level of uncertainty in stock market is high.

However, Saryal (2007) stated that inflation rate (INF) possesses high influence towards stock market development in Turkey. The increase in inflation rate indicates that investors need to bear higher cost of investments and risk level. Therefore, it will lead to the reduction in the demand of stocks. Before making wise investment decisions, potential investors will evaluate the impact of inflation rate (INF) towards the stock market development and there are few researchers even found that inflation rate (INF) and stock market development possess positive relationship.

On top of that, the occurrence of global financial crisis in United States in year 2008 and 2009 has greatly affected the global stock market and stock exchanges. When financial crisis happens, the investors will normally feel panic towards the speculation of stock performance and this will lead to the fluctuations in stock market. When financial crisis happens, the government will change the policies and it will collaborate with central bank to stimulate the economy so that the stock market performance will return back to the original level.

Chapter one is an introductory chapter which provides an overview of the study context and clarifies research related problems. The purpose of this research is to provide an overview of how Malaysia Stock Market Development (MSMD) will be affected by inflation rate (INF), money supply (M2), Real Effective Exchange Rate (REER) and financial crisis (Dummy). In this research, Malaysia

Stock Market Development will be measured in terms of Kuala Lumpur Composite Index (KLCI) returns.

1.1 Research Background

1.1.1 Research Background of Malaysia Stock Market

The stock market serves as a medium where shares from individual corporations are being issued and traded through the stipulated exchanges or Over-The-Counter (OTC) markets. The issued shares can be purchased by individual investors giving them a small portion of ownership in the particular organization. The trading of shares is vital for the economic growth of one country as it gives the extra financing for organizations which may affect the long term goals of the organization's industry which will directly influence the economic progress of the country to a great extent ('Corporate history,' n.d.).

In Malaysia, the first securities exchange company was started in 1930 bearing the name of Singapore Stockbrokers' Association and was later renamed to Malayan Stockbrokers' Association in 1937. After years of establishment, the very first public trading of shares began in 1960 which also marks the initiation of the Malayan Stock Exchange. It is linked by the technology of direct telephone lines, orders and trading of shares were executed in the trading rooms of Singapore and Kuala Lumpur. Shortly after the Malayan independence, the Stock Exchange of Malaysia was established in 1964 and upon the withdrawal of Singapore from Malaysia; the exchange was renamed to the 'Stock Exchange of Malaysia and Singapore'. Finally, when the currency interchangeability problem persists, the exchange was separated into the 'Kuala Lumpur Stock Exchange Berhad' and the 'Stock Exchange of Singapore' ('Corporate history,' n.d.).

The inception of the Kuala Lumpur Stock Exchange started on 14 December 1976 and took over the operations of the 'Kuala Lumpur Stock Exchange Berhad' from then onwards. In 2004, KLSE changed its name to 'Bursa Malaysia Berhad' in order to enhance its image and global position and to be in line with current market trends. Around year 2007, Bursa Malaysia was listed on the Main Market of 'Bursa Malaysia Securities Berhad'. It also attained International Organization for Standardization (ISO) certifications during that time ('Corporate history,' n.d.).

Around year 2009, 'Bursa Malaysia Berhad' entered a strategic partnership with Chicago Mercantile Exchange (CME) for better reach globally. CME holds 25% of the equity stake in 'Bursa Malaysia Derivatives Berhad', while the remaining 75% interest is held by 'Bursa Malaysia Berhad' ('Corporate history,' n.d.).

1.1.2 FTSE Bursa Malaysia Kuala Lumpur Composite Index

The Kuala Lumpur Composite Index (KLCI) was upgraded to the FTSE Bursa Malaysia KLCI in year 2009 and it serves as the market indicator for the Malaysia stock market. Using the KLCI, it allows investors to perform a thorough analysis on different perspectives and evaluate the management of certain corporations to the index series. Using internationally recognized standards and methods, the FTSE Bursa Malaysia KLCI will build the stated index according to the guidelines set by FTSE.

Figure 1.1.2: FTSE Bursa Malaysia Kuala Lumpur Composite Index
Source: Yahoo Finance (Period: December 1993 to February 2013)

The graph above demonstrates how Kuala Lumpur Composite Index (KLCI) portrays the overall performance of stock market in Malaysia. From the graph, it can be observed that the stock market demonstrates a steady uptrend movement before the financial crisis happened in year 2008. After the occurrence of financial crisis, the KLCI demonstrates a steep decline and this shows a drastic economic downturn in Malaysian Economy. Towards year 2009, the KLCI graph shows a slight improvement in figures giving some assurance to investors about the probability of economic rebound which pushes up the KLCI index to a higher point before declining to a steady level and progresses in a steady level.

1.2 Problem Statement

Nowadays, stock market works as an indicator in shaping a country's economic development. The establishment of the stock market exchange enables government and corporate institutions to raise quick capital in accelerating the economic development (Kyereboah-Coleman & Agyire-Tettey, 2008). In general, the health of the economy does not directly link with the performance of stock market. However, previous researchers have proved that the performance of share prices will be an indicator to reflect current economic conditions, trends as well as public confidence towards economic performance.

From year 2008 until year 2009, the stock market of United States collapsed due to subprime crisis. It has badly affected the performance of global stock market in several regions including China, Japan, Singapore, Hong Kong as well as Malaysia (Majid & Kassim, 2009). In the past, most of the researches have been conducted and they are concerning with the relationship between macroeconomic variables and stock market development in developed countries. It means that there are fewer researchers conducting their research in developing countries. Therefore, it is motivated to carry out the research in emerging stock market instead of developed stock market in order to clarify the relationship between macroeconomic variables and stock market development in developing countries.

Although Bursa Saham Malaysia (formerly known as 'Kuala Lumpur Stock Exchange') is not as liquid as foreign stock exchange market, the effect of global financial crisis still exists in Malaysia Stock Exchange. Since there is limited number of researchers using financial crisis as the independent variable in predicting the emerging stock market development, it encourages us to include current financial crisis (dummy variable) as one of the independent variables into this research. This financial crisis is known as "subprime crisis" which took place in 2008 to 2009. Moreover, most of the researchers only focus on quantitative independent variables. In this research, financial crisis indicates qualitative data which means that those data can be observed but it is hard to measure. It is different with quantitative data which can be measured in terms of time, cost, level and volume. There are three quantitative variables used in this research and it includes inflation rate (INF), money supply (M2) and Real Effective Exchange Rate (REER).

In conclusion, macroeconomic variables are critical in measuring the performance of stock market development. It is useful for the investors to analyze their investments based on the current stock market trend. Without the existence of macroeconomic variables, the investors can't decide clearly when they should enter or pull out from the stock market. Therefore, the main purpose of the research project is to identify and examine on the effects of macroeconomic variables which includes financial crisis (Dummy) on the emerging stock market development in both short run and long run dynamic in Malaysia (Zakaria & Shamsuddin, 2012a).

1.3 Research Objectives

1.3.1 General Objective

This research paper is carried out to identify and investigate the most influential macroeconomic variables on the stock market development in Malaysia from 1980 to 2013.

- *Stock Market Development is measured in terms of KLCI return.*

1.3.2 Specific Objectives

Objective 1: To investigate the effects of inflation rate (INF) on the stock market development (KLCI) of Malaysia.

Objective 2: To determine the effects of money supply (M2) on stock market development (KLCI) in Malaysia.

Objective 3: To examine the response of Real Effective Exchange Rate (REER) towards stock market development (KLCI) in Malaysia.

Objective 4: To investigate the impact of financial crisis (Dummy) on stock market development (KLCI) in Malaysia.

Objective 5: To examine the impacts of four independent variables above towards the stock market development (KLCI) in Malaysia.

1.4 Research Questions

1. Are the independent variables significant in explaining the dependent variable and the overall model?

2. Does long run relationship exist between the independent variables and dependent variable?

3. Do the independent variables and dependent variable possess uni-lateral or bi-lateral relationship in short run?

4. Which macroeconomic variable carries the most influential impact on Malaysia Stock Market Development (MSMD)?

Independent Variables: Inflation Rate (INF), Money Supply (M2), Real Effective Exchange Rate (REER), Financial Crisis (Dummy).

Dependent Variable: Stock Market Development (KLCI) in Malaysia.

1.5 Hypotheses of the Study

There are four main independent variables which have been identified in this research study such as inflation rate (INF), Money Supply (M2), and Real Effective Exchange Rate (REER) in addition with a dummy variable; financial crisis are included to investigate the impact on stock market development in Malaysia. As a result, the 5 main hypotheses are formed as below:

1.5.1 Inflation Rate (INF)

$\boldsymbol{H_0}$ **:** There is no significant relationship between inflation rate (INF) and stock market development (KLCI) in Malaysia.

$\boldsymbol{H_1}$ **:** There is significant relationship between inflation rate (INF) and stock market development (KLCI) in Malaysia.

Inflation rate (INF) is found to be a vital factor in determining the stock market development. Most of the researchers found that inflation rate and stock returns are positively associated. However, it is stated that there are no long run relationships between these two variables (Sajjad, Shafi, Jan, Saddat & Rehman 2012; Khan, Ahmad & Abbas, 2011). Besides that, Saleem, Zafar and Rafique (2013) find that inflation rate and stock prices in Pakistan possess long run correlation when they apply Johansen Co-integration Test. On the other hand, Li, Narayan and Zheng (2010) concluded that the relationship between inflation rate and stock market returns has varied results in medium term study. The expected inflation is positively related to stock market returns whereas unexpected inflation is negatively related to stock market returns. Therefore, in this research, it is expected that H_0 statement will be rejected to demonstrate the relationship between inflation rate and stock market development.

1.5.2 Money Supply (M2)

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

H_2 : There is significant relationship between money supply (M2) and stock market development (KLCI) in Malaysia.

Based on the researches conducted, it is undeniable that there are different results regarding the expected relationships between money supply and stock market development. There is researcher who found that money supply does not have a significant relationship with stock market development (Khan et al., 2011). However, Bilson, Brailsford and Hooper (2001) discovered that emerging market returns possess high sensitivity level to the changes in macroeconomic variables which include money supply. Moreover, there are certain researchers who found that money supply demonstrates positive relationship with stock market development (Abdelbaki, 2013; Khan et al., 2011). Last but not least, Hasan and Ahmad (2012) as well as Sohail and Hussain (2012) predicted that money supply delivers negative impact on stock market. In this research, it is expected that H_2 statement is supported.

1.5.3 Real Effective Exchange Rate (REER)

H_0 : There is no significant relationship between Real Effective Exchange Rate (REER) and stock market development (KLCI) in Malaysia.

H_3 : There is significant relationship between Real Effective Exchange Rate (REER) and stock market development (KLCI) in Malaysia.

Real Effective Exchange Rate (REER) is associated with the changes in the value of domestic currency relative to foreign currencies and it takes into consideration the inflation rate. When domestic currency depreciates, it benefits local manufacturers on their export activities. Therefore, it leads to trade surplus for a country's Balance of Trade (BOT) account which contributes significant effects on stock prices. This is consistent with the financial theory with the assumptions which stated that changes in exchange rate would influence the value of the firm. Hyde (2007) also found that level of exchange rate affected the performance of the firms. This means that firms will normally involve in exchange rate exposure where company portfolio's holding securities from different countries can be affected by the changes in real exchange rate. Furthermore, Jiranyakul (2012) even discovered that there is a bi-lateral relationship between real exchange rate and stock market volatility. This result has been strengthened by Tudor (2012) who stated that there is bi-directional effect between exchange rate market and equity market in Korea. Other than that, he even demonstrated an evolution in which the real exchange rate has a significant impact on next month stock market return. However, the causal effect between these two variables still remains controversial. In this research, it is expected that Real Effective Exchange Rate (REER) will affect the stock market development in which H_3 statement is supported.

1.5.4 Financial Crisis (Dummy)

H_0 : There is no significant relationship between financial crisis (Dummy) and stock market development (KLCI) in Malaysia.

H_4 : There is significant relationship between financial crisis (Dummy) and stock market development (KLCI) in Malaysia.

Rationally, there will be a significant relationship between the independent variable of financial crisis and stock market development. This is due to the stock prices move and reflect towards any financial information available and changes occur as an outcome from future expectations of the general public towards the performance of stock. The existence of financial crisis will lead to high stock market inefficiency because it would be harder for investors to control the effects of available information (Lim, Brooks & Kim, 2008). Hence, the initial estimation suggests that this paper rejects H_0 statement.

1.6 Significance of Research Study

This research study focuses in examining the impact of four macroeconomic variables on Malaysia Stock Market Development (MSMD) from 1980 to 2013 such as inflation rate (INF), money supply (M2), Real Effective Exchange Rate (REER) and financial crisis (Dummy). This research contributes beneficially to few main parties especially the Malaysia government, investors and policymakers.

Firstly, *Malaysia government* can further enhance the stock market efficiency and promote the financial stability in Malaysia. This can be explained by the government policies should be launched appropriately in order to stimulate the stock market development which contributes a positive growth in economy. For instance, the government should focus on utilizing the equity shares as the leading financial instruments to promote stock market efficiency (Sajjad et al., 2012). Besides that, money supply is one of the variables which can facilitate the growth and stability of stock market. Therefore, Malaysia government and central bank can change the monetary policy whenever the impact of money supply on stock market development is not obvious (Khan et al., 2011). At the same time, the inflation rate should be controlled at the optimum level in order to improve the performance of stock market (Saleem et al., 2013). There is no doubt that the research findings can develop a deeper understanding for Malaysia government about the effects of changing inflation rate and money supply on stock market development. Moreover, the government can even implement new legislations to facilitate a better investment conditions, increase the productivity and create new job opportunities to enhance the economic growth (Ali, Nasir, Zeshan, Mohammad & Tanvir, 2012).

Secondly, *either local or foreign investors* can gain lots of benefits through this research. By knowing the impacts of these macroeconomic variables on stock market development, it does assist the investors in selecting optimum portfolio (Rashid, Ahmad, Azim & Rehman, 2011). Furthermore, stock market development is greatly affected by the foreign exchange market. The investors can understand clearly regarding the correlation between Real Effective Exchange Rate (REER) and Malaysia Stock Market Development (MSMD) before they engage in any wise investment decisions (Granger, Huang & Yang, 2000). Moreover, they should be aware to the changes in exchange rate which can affect their stock market returns (Jiranyakul, 2012). At the same time, they can develop better strategies based on the current stock market trend (Tsai, 2012).

Last but not least, *the policymakers* can provide recommendations to the government regarding the restrain of inflationary pressures in order to maintain a desirable demand in stock market (Hasan & Ahmad, 2012). Moreover, global financial crisis does affect Malaysia Stock Market Development (MSMD) negatively. Therefore, through this research study, the policymakers can even form better understanding about the effects of global financial crisis and they can collaborate with the government in tackling this global issue. In other words, Malaysia government and the policymakers play the main roles in promoting a favorable business environment so that the foreign investors need not worry about the legal and financial structure of Malaysia before making any investments (Ali et al., 2012).

1.7 Chapter Layout

The research project is organized as follows:

In *Chapter 2 (Literature Review),* this research project will analyze what other researchers have conducted in their research regarding the issue of stock market volatility. In addition, the review of past studies will be conducted to examine the relationship between independent variables [inflation rate (INF), Money Supply (M2), Real Effective Exchange Rate (REER), financial crisis (Dummy)] and dependent variable (stock market development in Malaysia).

In *Chapter 3 (Methodology),* the methodologies used will be described in this research study. The research design, data collection methods, sampling design, research instruments as well as data processing and data analysis techniques will be conducted in this study in order to obtain valid results.

In *Chapter 4 (Data Analysis),* the results will be demonstrated together with the analysis of findings based on the data collected. Several tests like descriptive analysis, scale measurements and inferential analyses will be conducted to make sure that the findings are relevant to the hypotheses.

In *Chapter 5 (Discussion, Conclusion and Implications),* statistical analysis, discussions of the major findings in addition with the implications in this research study will be summarized clearly. Moreover, the limitations and recommendations for future research will be further discussed in this research study.

1.8 Conclusion

This chapter will discuss the background of issues, big picture of research objectives will be raised out in this study. Moreover, the importance and contribution of this study will be discussed. In the next chapter: Literature Review, the past empirical studies which are related to the relationship between the independent variables stated above and stock market development will be reviewed.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

The literature review for the previous studies will be reviewed in this chapter after the research background, problem statement, research objectives, hypotheses of study and significance of study were discussed in previous chapter. A literature review normally is related to the summarization, evaluation and descriptions on the various empirical studies in order to assist in determining the nature of research study topic.

The literature review will provide future researchers with a better understanding about the research done by previous researchers as well as some guidelines to improve the existing limitations in past studies. Moreover, it provides a clearer picture in identifying the independent variables that would have significant effects on the dependent variable which is Malaysia Stock Market Development (MSMD). Moreover, different methods can also be used to provide solutions for the problem aroused.

2.1 Review of the Literature

Generally, the purpose of literature review is to summarize, analyze and review on the theoretical articles or empirical studies carried out by previous researchers relating to the research title. At the same time, a deeper understanding can be developed by comparing different results found by the previous researchers.

2.1.1 Stock Market Development

Stock market is an important platform which allows companies to gain capital while investors obtain certain ownership from the company with the trading transactions. Stock market development can be considered as the performance of stock market which is based on the increase or reduction in stock prices or returns. It can be measured by using stock market return, stock market volatility, stock market liquidity and others. The main index and market indicator in Malaysia stock market is Kuala Lumpur Composite Index (KLCI) which provides information regarding the stock market as well as its performance and trend. The main market in KLCI consists of 30 well known companies with full market capitalization from Bursa Malaysia ('FTSE Bursa Malaysia,' 2011). Investors can even access the information of companies to obtain ideas regarding the current market trend before involving in a transaction.

When stock market fluctuation indicates high level of uncertainty, the investors will normally demand for higher risk premium in order to compensate the additional risk for holding the stocks. Therefore, it will cause the investors to delay their investments in which it can adversely affect the stock market development and the efficient allocation of resources in the financial market (Jayasuriya, 2005). There are many research studies investigated that stock market development is potential enough in affecting the economic growth of a country. In the stock market, a company can reduce its investment risk by gaining capital from the market and it may push up the economy growth due to lesser risk encountered. Besides that, stock market development can improve economic growth by attracting foreign investors to strengthen the linkage between foreign and domestic stock markets (Singh, 1993). This can be explained by when the stock market development is positive, foreign investors discovered that there is an opportunity to earn money and they will not hesitate to invest in the domestic country.

However, there are few studies stated that there is relationship between macroeconomic variables and stock market development. According to Abdelbaki (2013), the important determinants for Bahrain stock market development are income level, domestic investment, banking system development, private capital flows and stock market liquidity. As the market is liquid, the stock price will change from time to time whereas investors can gain profits from stock market in which it increases the income level of investors. At the same time, Garcia and Liu (1999) claimed that an increase in income level and financial intermediary development can enhance the stock market development. When the development of banking system is favorable, it does contribute significantly to stock market development because it can facilitate the transactions between investors and stock market.

In this research, different macroeconomic variables will be examined in which they will contribute to the stock market development in Malaysia from 1980 to 2013. These variables include the inflation rate (INF), money supply (M2), Real Effective Exchange Rate (REER) and financial crisis (Dummy) (Ali et al., 2012). The stock market development is measured using the Kuala Lumpur Composite Index (KLCI).

2.1.2 Inflation Rate (INF)

Rashid et al. (2011) define inflation rate as an indicator in measuring the stability of economic condition for a particular country. In general, it refers to the rising price level of goods and services which is expressed in percentage terms. Furthermore, high inflation might cause a great impact on economic activities of a particular country due to it reduces the purchasing power of domestic consumers and it would lead to the decline in the value of currency. Therefore, countries around the world have common goals to reduce or control the inflation rate in their countries in order to achieve economic stability.

Based on the research conducted by Aliyu (2012), inflation was investigated to test whether it contains any impacts on stock returns and volatility in Nigeria and Ghana by applying Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model. The results show that when there is fluctuation in inflation rate, it will cause the nominal stock returns to be more volatile in Nigeria than in Ghana. This research also highlighted that the stock market volatility is greatly affected by the unfavorable news announcement compared to favorable news. Besides that, Omran and Pointon (2001) analyze how the inflation rate affects the performance of the stock market in terms of activity and liquidity in Egypt by using Co-integration analysis through Error Correction Mechanisms (ECM). The results showed that inflation rate has significant negative impact on the market activity with the use of different market activity variables in long run but one of the market activity variables which is the number of traded companies is excluded in short run. It is also found that there is the existence of long run negative relationship between inflation and stock market liquidity.

There are some empirical studies which have examined on the correlation between inflation and stock returns in Pakistan. Saleem et al. (2013) discover that inflation rate and stock returns are negatively skewed. This research also highlighted that inflation rate possesses long run correlation with stock price by applying Johansen Co-integration Test. However, there is no granger cause relationship exists between inflation rate and stock prices. Moreover, Li et al. (2010) examined the relationship between inflation rate and stock returns in short term and medium term and under different inflationary regimes for UK. They found that expected inflation and stock returns are positively related whereas unexpected inflation and stock returns are negatively related. Besides that, this research result proves that the relationship between inflation and stock returns will differ in various inflationary regimes.

Furthermore, there are two empirical studies which analyze the relationship between macroeconomics factors and stock market returns in Pakistan. Both studies examine inflation rate as an important macroeconomic variable in determining the stock market returns. According to Sajjad et al. (2012), they found that inflation rate has positive impact on stock returns but it does not granger cause stock market returns when they applied Granger Causality Test. Besides that, this research result proves that long run relationship does not exist between macroeconomic variables including inflation rate and stock returns. Moreover, Khan et al. (2011) also indicated that inflation is the most significant factor which contributed to the changes of stock returns in Pakistan which is determined by Variance Decomposition. After the considerations regarding the results from past studies, it is mostly expected that there is negative relationship between inflation rate and stock market returns. When the inflation rate is high in a particular country, most of the investors will make lesser investments due to they earn less income which arises from the reduction in purchasing power and depreciation of currency. There is no doubt that their trading behaviors will affect the stock market development.

2.1.3 Money Supply (M2)

Money supply can be defined as the total amount in units of currencies supplied in the economy. However, money supply can even be categorized into M1, M2 and M3. M1 is considered as the narrowest scope in money supply in which it is made up of coins, checkable deposits, traveler cheques as well as currency notes and paper. On the contrary, M2 brings broader definition in terms of money compared to M1 due to it consists of the addition of M1, saving and time deposits in addition with non-institutional money market mutual funds whereas M3 is made up of M2 with large time deposits (Zafar et al., 2011). In this research, M2 will be used as a proxy for money supply and its effects on Malaysia Stock Market Development (MSMD) are examined in this research.

Although M2 is widely used as a proxy of money supply in most researches, its effects on stock market development in developing countries are inconsistent. Khan et al. (2011) found that money supply (M2) showed a positive relationship to stock returns. When money supply (M2) increases, it will deliver higher stock returns to investors. However, its effect is insignificant. On the other hand, Sohail and Hussain (2012) conducted their research regarding the impact of macroeconomic variables on three stock exchanges in Pakistan namely Islamabad Stock Exchange (ISE10 Index), Lahore Stock Exchange (LSE25 Index) as well as Karachi Stock Exchange (KSE100 Index). They discovered that money supply (M2) negatively affects KSE100 Index and ISE10 Index but positively affects LSE 25 Index in long term. Besides that, Li and Wu (2008) found that money supply demonstrates long run equilibrium relationship with stock price by applying Johansen Co-integration Test but its main objective is to examine the informational efficiency on stock market using macroeconomic variables in which it is similar with the research conducted by Hernandez (1999) who stated that when causal relationship is determined between the changes in money supply and the changes in stock price, the market is considered as inefficient due to the investors can predict future stock price based on the changes in money supply.

On top of that, Li and Wu (2008) and Abdelbaki (2013) mentioned about their views about monetary policy. Li and Wu (2008) stated that the financial markets which are unregulated or excessive regulated can promote the ineffectiveness of monetary policy. Moreover, there are some countries like Singapore and Hong Kong which wish to implement monetary policy to stimulate their export activities. At the same time, Abdelbaki (2013) suggested that expansionary monetary policy which is associated with the increase in money supply does stimulate the stocks' market value. The reason is when money supply increases, the interest rates will fall. Therefore, the investors can borrow more funds to put into their equity investments due to lower cost of borrowing. In his research, he stated that 1% increase in money supply can increase Bahraini Stock Market Development (BSMD) by 2.7% (Abdelbaki, 2013).

Zafar et al. (2011) conducted their research by applying Granger Causality Test and they noticed that there is a uni-lateral relationship between money supply (M2) and Karachi Stock Exchange. Moreover, Bilson et al. (2001) found out that the emerging equity returns are quite sensitive to certain macroeconomic variables including money supply. However, the expected relationship is not mentioned in their research. Last but not least, Hasan and Ahmad (2012) conducted their research regarding Amman stock market returns and they discovered that money supply carries a negative impact on stock market returns. In fact, it is expected that increase in money supply does stimulate the stock market and economic development due to the investors have higher business confidence and sufficient funds to invest in the stock market in which it will cause the stock market to become active.

2.1.4 Real Effective Exchange Rate (REER)

Foreign exchange rate is one of the factors that consolidates the financial position of a country (Adjasi, Harvey & Agyapong, 2008). This can be shown clearly when there are additional costs or revenues for households, firms and the state government which arise from the appreciation or depreciation of domestic currency as floating exchange rate policy is implemented in a particular country. Meanwhile, the appreciation of domestic currency will cause other foreign currencies to depreciate relative to the domestic currency.

Based on empirical studies, it stated that foreign exchange rate is vital in determining the stock market development. Most of the previous studies proved that the sign of regressed coefficient for Real Effective Exchange Rate (REER) is negative which is consistent with the expectation. When domestic currency depreciates, it attracts more investors to make investments in domestic country due to they can buy the shares at a lower price and resell them when the exchange rate bounce back. Badhani, Chhimwal and Suyal (2009) apply "Extended Market Model of Asset Pricing" and they found that there is a negative relationship between the stock index of export-oriented firms and the changes in Real Effective Exchange Rate (REER). This can be explained by the investment in export-oriented countries enables investors to earn abnormal profits during the period of exchange rate depreciation in which most of the firms will gain benefits from the export advantages and it may drive up the firm's stock price. This means that firms which are different in terms of their trading activities or sizes reflect different sensitivity levels of exposure from the exchange rate changes. This is further supported by Hyde (2007) who applied Beta Decomposition to demonstrate the changes in Real Effective Exchange Rate (REER) in which it contains significant influence about the future cash flow which indicates the performance of firm's stock.

On the contrary, Jiranyakul (2012) detects a positive association between Real Effective Exchange Rate (REER) and stock returns by applying Vector Autoregressive (VAR) model in Thailand. At the same time, he even indicates that there is a bi-directional relationship between Real Effective Exchange Rate (REER) and stock market volatility. In other words, both these variables will influence each other. Moreover, Korean stock market granger causes the KWR_USD exchange rate in a bi-directional effect (Tudor, 2012). This can be strengthened with the research carried out by Granger et al. (2000) who stated that stock prices are negative correlated with the Real Effective Exchange Rate (REER) in a bi-directional effect. According to Jiranyakul (2012), he realizes that there is no long run relationship between real exchange rate and stock prices.

Tsai (2012) demonstrated that there is negative association between stock price index and exchange rate in six Asian countries. It means the increase (decrease) in the returns of stock prices index will decrease (increase) the exchange rate in a uni-directional effect in which it is consistent with the portfolio balance theory. Meanwhile, domestic currency is undergoing appreciation or depreciation relative to foreign currency. In addition, Adjasi (2009) indicates that exchange rate changes can lead to high fluctuations in cocoa, gold's prices and the net cash flow in Ghana. Therefore, the price fluctuations for cocoa and gold as well as the demand and supply of currency would cause an impact to stock market development in Ghana. Tsai's research also proved that the appearance of profit opportunity is a main factor which encourages the foreign investors to enter into stock market at six Asian countries.

Furthermore, based on the research conducted by Rahman and Uddin (2009), they provide further evidence which stated that exchange rate does not have significant effects on stock market volatility in Bangladesh, India and Pakistan. Therefore, real exchange rate is selected instead of nominal exchange rate due to it is supported by Jayasuriya (2005) who indicates a significant negative relationship between real exchange rate and stock return in emerging stock markets.

2.1.5 Financial Crisis

The worst financial crisis ever happened after the Great Depression of 1930s will be the financial crisis between year 2008-2009 which is also known as the global financial crisis. It led on to a series of problems causing business and financial institutional failures as well as downturns in various investment markets including the stock and housing market. It was claimed that financial crisis has been caused by globalization where trade barriers have been significantly reduced causing a huge increase in the labor supply of developed countries from other countries without needing them to change their nationality. This change may have caused instability among financial institutions around the world which are trying to cope up and it causes the major economies around the world to collapse (Jagannathan, Kapoor & Schaumburg, 2013).

This is consistent with the findings of another researcher stating that globalization has resulted to further liberalization of rules in stock markets where linkage and integration between corporations are multiplied greatly. As such, the adoption of liberal rules removes a lot of restrictions which were previously carried out in foreign trading and this eventually creates a situation where stock prices become highly unstable resulting to great inefficiency and financial crisis (Sabri, 2002). This is contrary to the findings of another set of researchers stating that liberalization was not the cause to financial crisis but poor economic management and performance of the corporate sector instead (Kim & Singal, 2000).

On the other hand, there are empirical studies which find that financial crisis is relevant to the measurement of stock market efficiency and volatility. The occurrence of financial crisis is found to have an adverse effect on stock market efficiency (Lim et al., 2008). The amendments in regulations have influenced the involvement of bank activities which causes relative effects on stock market efficiency. The announcement of financial news causes changes in stock prices is due to stock prices are reflective towards any available information and financial crisis had made it harder for investors to control the effects of available information and it causes greater inefficiency and volatility in the stock market.

Focusing on a different perspective, financial crisis only causes short term stock market integration between East Asian countries. The researcher reasoned that this is only because of a market contagion and is not expected to be maintained for a long period of time (Huyghebaert & Wang, 2010). Moreover, the second reason for a short lived integration might also be caused by a sudden shock of financial crisis causing the East Asian countries to integrate and share financial information in order to prevent asymmetric information and greater fluctuations in their stock prices. The benefits of stock market integration is however referred to being overestimated by some researchers when the contagion effects have gone worst in the Middle East and North Africa regions even after market integration. It was also argued that market integration leads more vulnerabilities and systemic risks (Neaime, 2012). It is expected that the existence of financial crisis can lead to the collapse of stock market in which it will adversely affect the stock market returns.

2.1.6 Summary of Tests

Several empirical studies have examined the impact of stock market development based on the changes in macroeconomic variables such as inflation rate (INF), money supply (M2), Real Effective Exchange Rate (REER) as well as financial crisis (Dummy). There are different methods used by previous researchers to measure the relationship between macroeconomic variables and stock market development in developing countries.

First of all, this research must make sure the series are stationary in order to proceed to other tests. Therefore, unit root test which consists of Augmented Dickey Fuller (ADF) as well as Phillips-Perron (PP) Tests will be applied in this research to check whether the variables fulfill the stationary properties (Granger et al., 2000; Tsai, 2012; Zafar et al., 2011; Khan et al., 2011; Sohail & Hussain, 2012; Li & Wu, 2008; Sajjad et al., 2012; Saleem et al., 2013). Furthermore, it can be used to examine the existence of trend and autocorrelation problems in the model.

Besides that, Johansen Co-integration Test has been applied in this research to examine the long run relationship between independent variables and dependent variable. The co-integration between the variables indicates that there is the existence of long run relationship between the independent and dependent variables (Sajjad et al., 2012; Khan et al., 2011; Saleem et al., 2013; Omran & Pointon, 2001; Zafar et al., 2011; Sohail & Hussain, 2012; Li & Wu, 2008).

Granger Causality Test is conducted to check whether causal relationship exists between the macroeconomic variables and stock market development. It is used to determine whether the macro variables granger causes the dependant variable as well as identify whether they have uni or bi-directional relationship with stock market development (Zafar et al., 2011; Li & Wu, 2008; Abdelbaki, 2013; Granger et al., 2000; Rahman & Uddin, 2009; Tudor, 2012; Sajjad et al., 2012; Saleem et al., 2013). Last but not least, Variance Decomposition is carried out with the purpose of checking the short term connections between macroeconomic determinants and stock index return (Khan et al., 2011; Abdelbaki, 2013).

2.2 Review of Relevant Theoretical Models

2.2.1 Fisher Hypothesis

In Fisher theory, the long term relationship holds when nominal interest rate is adjusted to expected inflation (Ling, Liew & Wafa, 2010). Moreover, it states that nominal interest rate can be calculated based on the following equation:

$$\boldsymbol{i = r + \Delta P_e}$$

Where,

i : The nominal rate of interest

r : The real rate of interest

ΔP_e : The expected changes in the price level (Expected inflation)

There are three assumptions which need to be taken into considerations in Fisher theory. Firstly, the anticipated rate of inflation will be used instead of reported rate of inflation. Secondly, most countries will conduct the fisher hypothesis by using the rise in the expected price level (expected inflation) than the decline in the expected price level. This is due to the common change in the price level for a country which may increase over certain periods. Thirdly, the nominal interest rate will be computed in which it is equal to the real rate of interest when the expected inflation is eliminated. Real rate of interest refers to the market rate of interest (Kidwell, Peterson, Whidbee & Blackwell, 2008).

Kumari (2011) stated that stocks are hedged against inflation rate when the nominal returns on an asset can be changed corresponding to the change of expected inflation rate without affecting the real rate of interest. Furthermore, the actual nominal interests can be determined by considering the anticipated and unanticipated nominal returns as well as the anticipated and unanticipated inflation based on the extension of Fisher Hypothesis (Li et al., 2010). Moreover, Ling et al. (2010) conducted a research to further examine the validity of Fisher Hypothesis in 10 East Asian economies by using stationary real rate of interest when the reliability of the Fisher hypothesis is affected by the existence or non-existence of real interest rate in the economy. They discovered that nominal interest rate and anticipated inflation have long run relationship in 10 East Asian economies.

2.2.2 Monetary Policy

Monetary policy is associated with the changes in money supply and interest rate which are controlled by the central bank. Normally, monetary policy can be subdivided into expansionary and contractionary monetary policies in which they are used to deal with the inflation and unemployment problems. Expansionary monetary policy is used to stimulate the economic growth, increase the aggregate output as well as solve the unemployment problem (Case, Fair & Oster, 2009). Firstly, central bank will increase money supply through three main ways such as purchasing the securities in the open market, reducing the discount rate and Required Reserve Ratio (RRR) in which it causes the interest rate to fall. Therefore, the investment activities will increase due to the investors can borrow more funds at lower cost of borrowing to fund their investments. The economic development can be enhanced and it does create many employment opportunities. However, the main disadvantage of expansionary monetary policy is it can lead to inflation problem if the economy is overheated (Case et al., 2009).

On the contrary, contractionary monetary policy is normally launched by the central bank in order to tackle the inflation problem. It is greatly associated with the countries which possess high inflationary pressure. This can be explained by central bank will limit the money supply by selling the securities in the open market, increasing the discount rate in addition with Required Reserve Ratio (RRR). Its action will cause the interest rate to rise. It means the investors will have less money to put into their investments due to higher cost of borrowing. There is no doubt that the investment activities will drop and the market returns to the equilibrium point. However, if contractionary monetary policy persists too long, it does create unemployment problem in which it drags the economy into recession (Case et al., 2009).

2.2.3 Law of One Price

Law of One Price is greatly associated with the Purchasing Power Parity (PPP) of exchange rate. This theory carries the means in which the price for the identical products should be constant for all the countries around the world and it is assumed that the government does not impose any restrictions on the level of sales and there is no transportation cost in transferring the products between the markets (Kidwell et al., 2008). This can be supported with the research conducted by Haskel and Wolf (2001) who stated that Law of One Price is difficult to be applied by all the countries due to there are differences in terms of transportation costs, the tariffs charged on the goods and pricing strategies for different countries. Moreover, if the identical products are sold in the same price, there will be no competition between the firms in addition with there will be no arbitrage profits (Haskel & Wolf, 2001).

On top of that, Law of One Price even states that when the price of the particular products is expressed in different currencies, the formula stated below can be applied in order to discover the price in other countries (Eg: U.S.). For instance, the price of product sold in local country (RM) is multiplied with the spot exchange rate of U.S. dollar per RM and the price of the identical product sold in U.S. will be obtained (Kidwell et al., 2008).

$$P^{RM} \times S^{\$/RM} = P^{\$}$$

2.2.4 Flow-Oriented Model

The Flow-Oriented Model was implemented by Dornbusch and Fischer in year 1980. This model is used to investigate the effects of fluctuation of real exchange rate relating to stock market volatility (Adjasi et al., 2008). Besides that, Adjasi et al. (2008) demonstrated that there is the existence of bi-directional causal effects between foreign exchange market and stock market. This has been further supported by Rahman and Uddin (2009) who applied Flow-Oriented Model and they found that there is a bi-lateral relationship between real exchange rate and stock price. For instance, when there is a decline in share price, it will deliver the signal of awareness to the investors. Normally, the investors who are risk averse will withdraw their funds from the investments due to they prefer holding more cash on hand. Therefore, it will create volatility to the stock market. In other words, when the investment activities become lesser in the particular country, it will reduce the liquidity in the stock market. As a result, this will cause the domestic currency to depreciate (Rahman & Uddin, 2009).

In addition, Badhani et al. (2009) pointed out the changes in exchange rate will influence the cash flow of firms especially for the industries which engaged in the import of raw materials and the export of goods and services. This is due to they have the high possibility to expose to the currency risk. For instance, the revenues earned are normally denominated in foreign currencies and the firms might expose to exchange rate changes when they convert back the revenues into home currency. Based on Badhani et al. (2009), they also stated that the appreciation of domestic currency is negatively correlated with the local stock market especially for an export-oriented country. It is expected that when the currency for a particular export-oriented country depreciates, it means that it can gain the export benefits. This can be further explained by the price of local goods and services are considered cheaper than the goods produced by other countries. Therefore, domestic or foreign consumers will purchase more local products due to cheaper price whereas domestic consumers will spend less on the higher priced imported goods. This leads to a significant effect on stock market which arises from the changes in exchange rate.

2.2.5 Portfolio Balancing Model

The Portfolio Balancing Model is one of the models which is used to examine the significance of effects between real exchange rate and stock market volatility. According to Badhani et al. (2009), they stated that the inflow of foreign capital assists in expanding the economic activities which lead to the increasing demand of domestic currency. This means the value of domestic currency will rise due to the demand for local currency is more than its supply. Therefore, foreign investors are more likely to revise and restructure their investment portfolios based on the changes in stock prices and the exchange rate movement from time to time (Badhani et al., 2009). Normally, most of the investors apply technical analysis and extrapolation techniques in forecasting the movement of future exchange rate and stock prices. However, these techniques cannot predict the exchange rate and stock price accurately because the application of both techniques are based on historical data in addition with they exclude the special events such as financial crisis, speculations as well as natural disasters (Badhani et al., 2009). Rahman and Uddin (2009) stated that a rise in local stock price encourages the investors to hold more domestic shares instead of foreign shares. As a result, Portfolio Balancing Model plays a major role to promote the investors in holding more shares denominated in home currency due to appreciation of domestic currency. Besides that, this will attract more foreign capital inflow due to foreign investors can gain higher returns from the local stock market. Portfolio Balancing Hypothesis examines that there is bi-lateral relationship between foreign exchange market and stock market (Badhani et al., 2009). Most of the empirical studies discovered that there is positive relationship between real exchange rate and stock market volatility. On the contrary, some of the studies indicate that real exchange rate is negatively correlated to stock market volatility. Last but not least, there were few researchers reported that there are no significant associations between real exchange rate and stock market volatility.

2.2.6 Capital Asset Pricing Model (CAPM)

According to Gitman (2012), Capital Asset Pricing Model (CAPM) was created by Harry Markowitz and William Sharpe in year 1950 and 1960. This model was used to examine the significance of relationship between the expected returns and risk. There are few assumptions which need to be considered in CAPM. Firstly, the investors will only invest in the asset when the expected return is at least equal or more than the required return. Secondly, CAPM assists in determining the required return on an asset. Finally, the determination of required return can be represented by the asset's value. Moreover, beta coefficient needs to be included in calculating the required return for CAPM as well as measuring the market risk (Gitman, 2012).

The formula for CAPM is stated as below:

$$k_e = r_f + (r_m - r_f)\,\beta$$

Where,

k_e : The required rate of return

r_f : The risk free rate of interest

r_m : The return for market portfolio

β : Beta (Market risk)

The formula above shows that beta coefficient is positively related to the required return. This can be evidenced by the research conducted by Heshmat (2012) who stated that the higher the beta coefficient, the higher the required rate of return in the Saudi Stock Market (Emerging market).

2.2.7 Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis (EMH) is one of the theoretical models applicable for studies in which it is closely associated with stock prices. According to the mastermind of this theory Professor Eugene Fama, an efficient market holds whenever stock prices are reflected fully on existing information available in the market leading to equitable estimations for underlying asset value. However, the term "fully reflected" was claimed to be too general for researchers in executing empirical tests to determine the market efficiency. Hence, the empirical tests are subdivided into three levels which include the weak form, semi-strong form and strong form levels of EMH.

The basis of testing starts from the weak form tests which concentrate on the historical prices of stocks. The forms of testing in the weak form tests are closely linked to the Random Walk Theory which will be elaborated further in the following section. When the weak form of EMH is tested and after it is proved to be consistent with its efficiency hypothesis, the execution of semi-strong form of EMH tests will be conducted in which the element of price adjustment towards publicly available information will be focused (Fama, 1960). After proving the consistency of Efficient Market Hypothesis (EMH) at the semi-strong form level, the strong form tests are conducted where emphasizes are put on whether the particular groups have exclusive access to information regarding the formation of stock price. Upon the fulfillment of these basic requirements, the market will then be regarded as efficient (Fama, 1960).

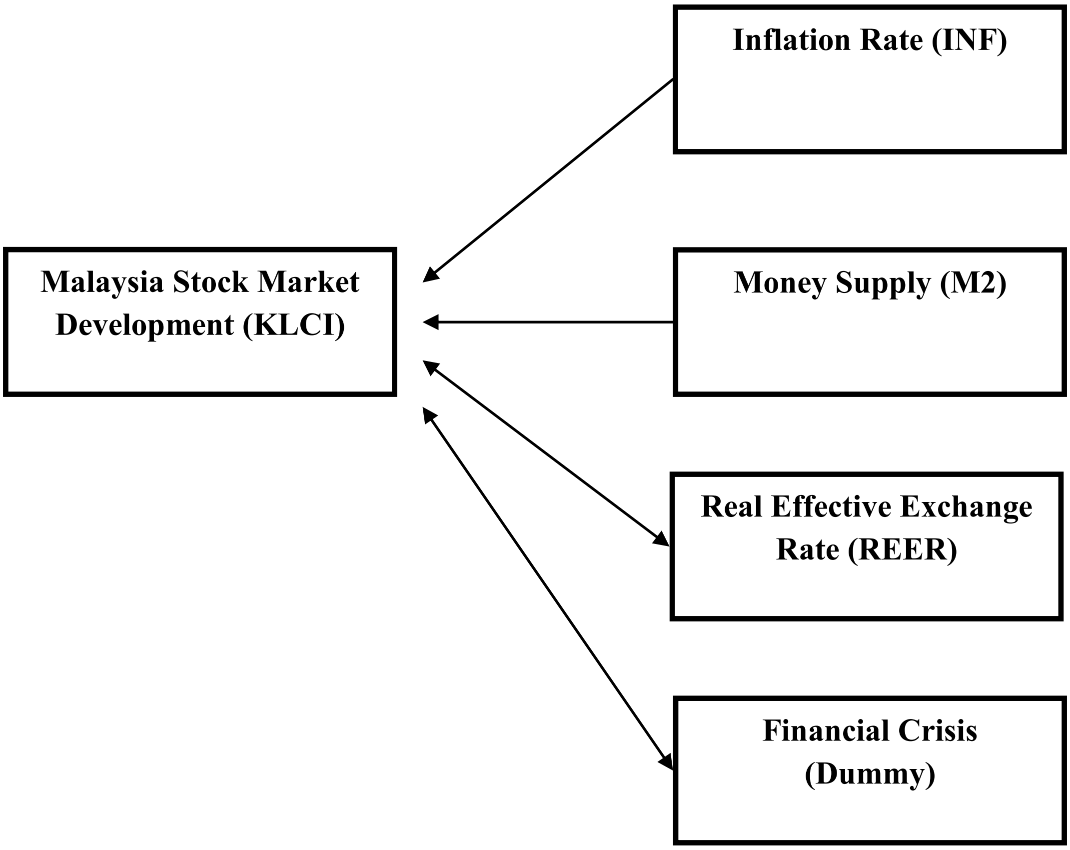
2.2.8 Random Walk Hypothesis

Random Walk Hypothesis is one of the financial theories which stated that the future changes in market price should be unpredictable for all practical purposes based on the historical information (Mishkin & Eakins, 2012). When the market is inefficient, investors may earn abnormal profit due to the investors can grab the opportunities to buy the stock at lower price and they can resell it at higher price (Lai, Balachandher & Fauzias, 2003). According to Arshad, Shoaib and Ali (2007), they stated that when there is a predictable error term in nature, Random Walk Hypothesis shows that the current market price will be the best indicator in predicting the future price. Normally, it consists of two tests which can be run to indicate the use of Random Walk Hypothesis such as Dickey-Fuller Unit Root Test and Variance Ratio Test. In the research conducted by Lo and Mackinlay (1988), they applied Variance Ratio Test to indicate whether the stock price follows Random Walk Hypothesis. Based on the research result, they found that the Variance Ratio Test is better than Dickey-Fuller Unit Root Test.

Besides that, Fama (1965) claimed that there are two approaches which are used to estimate the stock price such as “Chartist or Technical theory” as well as the theory of “Fundamental or Intrinsic Value Analysis”. Normally, Chartist theory is based on the information of previous pattern of price series to forecast the future price series. It is rarely used due to it is enclosed with specific portion of mysticism. On the contrary, fundamental analysis approach assumes that each stock has its own intrinsic value which depends on the vital factors such as management quality, industry perspectives, economy and others.

2.3 Proposed Theoretical Framework

Dependent Variable: **Independent Variables:**



The figure above demonstrates a framework identifying the connections between imperative variables and stock market development which is intended to describe the association of variables clearly.

Due to the limitations of previous researches, the framework was developed on the basis of proper identification of the respective dependent and independent variables in order to proceed with the further investigations.

The independent variable is a standalone measurable variable that can be manipulated to influence the outcome of dependent variable whereas dependent variable is the consequent of the independent variables and explains what has been done in this research (Dodge, 2003). This research study focuses on the time frame within year 1980 to year 2013.

2.4 Conclusion

In this chapter, the literature will be reviewed based on related research topic. The methodologies and findings will be summarized to show the relationship between each independent variable and Malaysia Stock Market Development (MSMD) in detail. It shows that different concepts and suggestions will be provided within varied studies. Moreover, theoretical models and theoretical framework were discussed in this chapter. Lastly, each independent variable and a dependent variable have been identified so that testable hypotheses can be initiated in order to examine the validity of formulated theories. As a result, the literature review done will help carry out the research methodology in next chapter.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This research study attempts to investigate the determinants which will affect the stock market development (KLCI) in Malaysia. The macroeconomic variables examined in this research include inflation rate (INF), Money Supply (M2), Real Effective Exchange Rate (REER), as well as Financial Crisis (Dummy). There are a total number of 397 observations for the sample size. The time series data are obtained from several sources such as World Bank, International Financial Statistics, FTSE Bursa Malaysia and Oxford Economic. At the same time, several tests are conducted to examine the biasness, efficiency and consistency of coefficient parameters. Finally, this study provides an interesting finding whether these four independent variables will significantly affect the stock market development.

3.1 Data Collection Methods

This study mainly concerns on *secondary data* which examines the time series data collected from the UTAR Library DataStream. These data are mainly the quantitative variables. On the other hand, the qualitative variable which is (financial crisis) in this research is assigned with “0” for the non-existence of financial crisis but “1” for the existence of the financial crisis effects around the particular period on a monthly basis. The determination of the existence of financial crisis is supported with the journals found in which one type of global financial crisis (U.S. subprime crisis) is included into the model.

3.1.1 Secondary Data

The data of all the independent variables and dependent variable are collected on a monthly basis from year 1980 to 2013. The summary regarding the sources of data for all variables are stated in a table below:

Variables	Proxy	Explanations	Units	Sources
Stock Market Development	KLCI	Kuala Lumpur Composite Index (KLCI) for Malaysia stock market.	Index	Reuters
Inflation Rate	INF	Consumer Price in percentage (%).	Percentage (%)	International Financial Statistics (IMF)
Money Supply	M2	M2 = M1 + saving deposits + time deposits + money market mutual funds (Non-institutional) M1 = currency notes + coins + checkable deposits + travelers cheques	Malaysia Ringgit (MYR)	International Financial Statistics (IMF)
Real Effective Exchange Rate	REER	Real Effective Exchange Rate based on Consumer Price Index in Malaysia.	Index	International Financial Statistics (IMF)
Financial Crisis	Dummy	Global financial crisis.	-	Financial crisis and stock market

				efficiency: Empirical evidence from Asian countries.

Table 3.1.1: Sources of Data

Moreover, journals and articles are used as additional data for reference purposes. The summary and analysis of journals are used as a guideline before starting the analysis of the data collected for each variable. Moreover, it also helps to review the unit measurement for each variable which can be used to address results with better accuracy. With access to journals and articles online, the research will be able to obtain information at a lower cost and in a timely manner.

3.2 Sampling Design

3.2.1 Target Population

This research project aims on investigating the relationship between the selected independent macroeconomic variables and dependent variable which is stock market development in Malaysia from 1980 to 2013. In this study, Malaysia is selected to be a target population where the stock market is known as Bursa Malaysia based on the sample period from year 1980 to 2013. This study will be using data and empirical results from other developing countries to determine the impact of macroeconomic variables on stock market development as a whole. The Kuala Lumpur Composite Index (KLCI), representative of the best 30 listed companies will be used as an indicator to measure the stock market development in

Malaysia because of the index accuracy in identifying the development of the Malaysia stock market.

3.2.2 Sampling Technique

In this paper, E-views 6 will be used as the analysis tool to analyze the findings. E-views is chosen due to its versatility as it can be run on different platforms such as Microsoft Windows and Apple Macintosh. Moreover, it is an Econometrics software package designated with an intention to work with time series data. Moreover, it can also be used for cross-sectional and panel data. The main usage of E-views is to execute time series regressions and enable the users to run the hypothesis testing, diagnostics checking and correction procedures.

By using E-views 6, many empirical studies can be carried out such as Ordinary Least Squares (OLS) method, Unit Root Test, Johansen Co-integration Test, Granger Causality Test as well as Variance Decomposition and Impulse Response Function Tests. Ordinary Least Squares (OLS) is used to measure the linear relationship between two variables such as the determination of the significance of independent variables on dependent variable as well as the overall significance of model using T-test and F-test respectively.

When conducting Unit Root Test, the two common approaches used in investigating the stationarity of the variables are Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Tests. Besides that, Johansen Co-integration Test will be used to determine the co-integrating vectors between independent and dependent variables through Maximum Likelihood (ML) approach. For Granger Causality Test, it is used to check whether one variable will affect another variable in uni-lateral or bi-lateral relationship. It can also be used to predict the variable by using other influencing variables. Finally, Impulse Response Function and Variance Decomposition will also be applied. These few tests are chosen to be used because previous researchers always like to relate their ideas and opinions to perform an analysis on the stock cases of developing countries. Furthermore, previous researchers also found that these tests are the best methods in examining the relationship of different macroeconomic variables on stock market.

3.3 Data Processing

From the beginning of this research, there are at least 20 journals which are related to the research title: "The Determinants of Stock Market Development in Malaysia from 1980 to 2013" need to be searched. After that, analysis on these journals will be carried out in order to determine the main points to be used in this research. At the same time, data of the dependent variables and independent variables used in this research were collected from the secondary source which is the DataStream facility available in UTAR Block G library. In addition, the data regarding the dummy variable, financial crisis will be obtained based on the evidence stated in journals. After that, the data collected will be arranged, edited and calculated before proceeding to the use of E-views 6 in conducting the tests. Finally, the research results will be interpreted as soon as results are obtained from E-views. The data processing activities are demonstrated in Figure 3.3 below:

Journals which are related to the research title are found and used for analysis.

⇩

The data of independent variable and dependent variables are collected using the DataStream facility.

⇩

The data will be arranged, edited and run by using E-views 6.

⇩

The research results are ready for interpretation.

Figure 3.3: The Flow of Data Processing

3.4 Multiple Linear Regression Model (MLRM)

Multiple Linear Regression Model (MLRM) consists of more than one independent variable in the model. One of the aspects discussed in multiple regression models is Best Linear Unbiased Efficient Estimator (BLUE) results. The term "Best" means that it must be the best model with minimum error or optimal standard error of estimation. Besides that, all estimators must be in linear form. It is unbiased where the expected value of β_2, $E(\hat{\beta}_2)$ is equal or near to the true value of β_2. Moreover, it has the minimum variance in the class as linear unbiased estimators. An unbiased estimator with the least variance is known as an efficient estimator.

Economic Function:

LKLCI = f [Inflation Rate (INF), Money Supply (LM2), Real Effective Exchange Rate (LREER), Financial Crisis (Dummy)].

Economic Equation in Logarithmic Form:

$$LY_t = \beta_0 + \beta_1 X_t + \beta_2 LX_t + \beta_3 LX_t + \beta_4 X_t + \varepsilon_t$$

$$LKLCI_t = \beta_0 + \beta_1 INF_t + \beta_2 LM2_t + \beta_3 LREER_t + \beta_4 Dummy + \varepsilon_t$$

Where,

$LKLCI_t$	:	The natural logarithmic form of Kuala Lumpur Composite Index (KLCI) at year t.
INF_t	:	Inflation rate (INF) at year t.
$LM2_t$	:	The natural logarithmic form of Money Supply (M2) at year t.
$LREER_t$	:	The natural logarithmic form of Real Effective Exchange Rate (REER) at year t.
$Dummy$	:	Financial crisis at year t where 0 represents no financial crisis in the particular months and 1 represents financial crisis which happened in the particular months.
ε_t	:	Error term at year t.

3.5 Data Analysis

3.5.1 Ordinary Least Squares (OLS) Method

Ordinary Least Squares (OLS) method was invented by Carl Friedrich Gauss in 1795. It can be considered as one of the famous statistical techniques applied by most researchers in predicting the linear relationship between two variables. This method is used due to some of the residuals possess negative signs whereas some of them possess positive signs. As a result, the sum of errors will not be accurate due to the positive sign of the residuals will offset the negative sign of the residuals. In order to overcome this problem, this method suggests that the residual terms can be squared so that all the values will become positive. After that, the value of residuals squared can be added together and the OLS line which gives the minimum total residuals squared is considered as the best line.

Although OLS method can be easily understood, applicable and interpreted compared to other regression techniques, it does come with certain disadvantages. Firstly, OLS method cannot perform well when there is outlier. It means that some of the data possess excessive large or small values in which they are not near to the average values of all data collected. Therefore, it may violate the principle of OLS method which is the minimum total errors squared. Besides that, researchers are incapable to apply this technique in finding the non-linear relationship between the variables due to most of the variables demonstrate more on the complex non-linear relationship than the simple linear relationship. On top of that, OLS method cannot perform well when there are too many independent variables included in the model in addition with the existence of wrong functional form of variables which may affect the accuracy of results generated by OLS method (Gujarati & Porter, 2009).

3.5.2 T-Test

T-test statistic which was implemented by William Sealy Gosset in 1908 is normally used to check whether each of the independent variables is significant in explaining the dependent variable which is Malaysia Stock Market Development (MSMD). In this case, the independent variables are inflation rate (INF), money supply (M2), Real Effective Exchange Rate (REER) as well as financial crisis (Dummy). In this research, T-test statistic can be conducted by using E-views 6 and it can be obtained from the equation window and the P-value of each parameter can be obtained from the output (Gujarati & Porter, 2009).

The null and alternative hypotheses for this test are stated as below:

$\boldsymbol{H_o}$: There is no significant relationship between the independent and dependent variables ($\beta_i = 0,\ i = 1, 2, 3, 4$).

$\boldsymbol{H_1}$: There is a significant relationship between the independent and dependent variables ($\beta_i = 0,\ i = 1, 2, 3, 4$).

The decision rule states that null hypothesis will be rejected if P-value of T-test statistic is lower than the level of significance, α. Otherwise, do not reject it.

3.5.3 F-Test

F-test statistic which was implemented by George and Sir Ronald in 1920 is used to test the overall fitness of the model. Moreover, F-Test can be conducted by using E-views 6 and the value can be obtained from the equation window and the P-value of F-test statistic can be obtained from the output (Gujarati & Porter, 2009).

The null and alternative hypotheses for this test are stated as below:

H_o: The overall model is insignificant.

H_1: The overall model is significant.

The decision rule states that null hypothesis will be rejected if the P-value of F-test statistic is lower than the level of significance, α. Otherwise, do not reject it.

3.5.4 Normality Test

Normality test is used to check whether the error term in the model is normally distributed. Error term indicates the overall influence on the dependent variable such as the omission of independent variables. Basically, in order to run the normality test, Jarque-Bera (JB) Test has been applied in this study.

Under this test, the null and alternative hypotheses for this model are stated below:

H_0 : The error term is normally distributed.

H_1 : The error term is not normally distributed.

The decision rule concludes that null hypothesis will be rejected if P-value of Jarque-Bera statistics is lower than the level of significance, α. Otherwise, do not reject it. If the result shows that the error term is not normally distributed, it means that there is possibility of occurrence for multicollinearity, heteroscedasticity and autocorrelation problems in the model (Gujarati & Porter, 2009).

$$JB = n\left[\frac{S^2}{6} + \frac{(K-3)^2}{24}\right]$$

Where,

N   *: Sample size*

S   *: Skewness of Coefficients*

K   *: Kurtosis of Coefficients.*

3.5.5 Unit Root Test

Unit Root Test is also known as "Stationarity Test". Under this test, a stationary series carries the means regarding a series with constant mean, constant variance as well as constant autocovariances for each lag provided (Brooks, 2008). It is crucial in developing the integration order for each variable due to if the variables are not stationary; it will lead to spurious regression. In other words, spurious regression means that the regression is still considered as inaccurate although standard regression techniques are applied due to the existence of non-stationary data. Besides that, non-stationary variables can cause the hypothesis testing for regression parameters to become invalid. This can be further explained by the t-ratios will not follow a standard t-distribution whereas F-statistic will not follow standard F-distribution and it will affect the accuracy of the hypothesis testing. Normally, there are two widely used approaches under Unit Root Test: Augmented Dickey-Fuller (ADF) Test and Phillips-Perron (PP) Test (Brooks, 2008).

Under Unit Root Test, the null and alternative hypotheses are as follow:

H_0 **:** All variables are not stationary and have unit root.

H_1 **:** All variables are stationary and do not have unit root.

This test is conducted in a way in which it consists of a regression of the first difference series against the lagged once series, lagged difference terms, a constant and a time trend (Al-Sharkas & Al-Zoubi, 2013). The test statistic for this test does not follow normal t-distribution but non-standard distribution under null hypothesis. One of the major concerns under this test is the determination of the optimal lag length for the dependent variable. There are two suggested ways to determine the optimal lag length. Firstly, the determination is based on data frequency. For instance, twelve lags will be used if the research involves monthly data (Brooks, 2008). The second method is the determination based on the information criterion. The lag length chosen depends on the minimum value of information criterion. However, if too much lags are included in the model, it will increase the standard error which lowers the test statistic value. Therefore, this test is criticized to have weak power properties in which the power of the test will be greatly reduced (Paramiah & Akway, 2008; Brooks, 2008).

For Phillips-Perron (PP) Test, it can be conducted by applying the same principles as Augmented Dickey-Fuller (ADF) Test. However, it can develop a better theory regarding the unit root non-stationarity and it incorporates an automatic correction to ADF procedures (Brooks, 2008).

3.5.6 Johansen Co-integration Test

When there is same order of integration between the exogenous and endogenous variables, Johansen Co-integration Test will be carried out to determine the number of co-integrating vectors between those variables in long run. Besides that, this test can only be carried out using Maximum Likelihood (ML) approach. It is known as "Multivariate Approach to Co-integration" in which there is a probability to have more than a single co-integrating relationship. Moreover, "Trace Test" and "Maximum Eigen Value Test" can be considered as the approaches used in Johansen Co-integration Test in determining the co-integration ranking (Gujarati & Porter, 2009).

Under this test, the null and alternative hypotheses are as follow:

H_0 : There is no long run relationship between the variables.

H_1 : There is long run relationship between the variables.

The Vector Autoregressive Model (VAR) will be converted into Vector Error Correction Model (VECM) when error correction term is included into the model (Brooks, 2008). This research will apply VECM when those variables are co-integrated. Co-integration carries the means in which there is long term equilibrium relationship among those variables. However, Granger Causality Test can be applied directly to examine the directional relationship among those variables if there is no co-integration relationship between those variables (Asari, Baharuddin, Jusoh, Mohamad, Shamsudin & Jusoff, 2011).

The number of co-integrating vectors is determined by the ranking of the co-integrating vectors in the VECM. For example, the two linear combinations of non-stationary variables will turn into stationary when the ranking of co-integrating vectors equals to two. Moreover, when there is negative and significant coefficient of Error Correction Model (ECM), it demonstrates the existence of a long run relationship between the exogenous and endogenous variables when there is short term fluctuation between the variables (Asari et al., 2011).

3.5.7 Granger Causality Test

In order to compensate the limitations of the Co-integration Test, Granger Causality Test would be applied. This test had been developed in 1969 by Clive Granger to find out the causality effect in time series based data. It was generally used to determine the direction of short run relationship between the independent and dependent variables. Unlike Co-integration Test, Granger Causality Test is able to examine on the effects for non-stationary data. On top of that, it can be used to determine the causal directions between the variables. Lastly, the presence of lags in the time series data makes the causality test between independent and dependent variables to be relevant (Gujarati & Porter, 2009).

Under this test, the null and alternative hypotheses are as follow:

H_0: There is no granger cause relationship between each independent variable and dependent variable in short run.

H_1: There is granger cause relationship between each independent variable and dependent variable in short run.

There are vast researches which have been conducted using Granger Causality Test in determining whether the relationship between the variables persists. Moreover, it was further demonstrated by other sets of researchers' who were using Granger Causality Test to determine the relationship between stock price and economic growth (Comincioli, 1996; Foresti, 2006). On top of that, Christ and Bremmer (2003) utilized the Granger Causality Test in examining how the stock prices can affect consumer confidence in a unidirectional causal effect.

However, there are bound to be some limitations in Granger Causality Test. This test will only be able to examine the variables in which they must be in linear form. Besides that, it will not show the expectation sign and durations for the causal effect. In addition, Granger Causality Test can only be used to examine on short run effects (Gujarati & Porter, 2009).

3.5.8 Impulse Response Function and Variance Decomposition

Impulse Response Function is one of the approaches under Vector Autoregressive (VAR) models used to detect the responsiveness of dependent variable based on the effects of each independent variable in short term. This approach is considered efficient when the time series data are stationary after the first or second difference (Elder, 2003). Moreover, the duration regarding the positive or negative effects can be estimated as well. When comparing with this approach, Variance Decomposition offers a slight difference in examining the VAR System. It can provide the proportions of movement regarding the dependent variable caused by its own shock as well as the shocks to other variables.

The null and alternative hypotheses stated under this approach are as below:

H_0: The macroeconomic variables examined do not have significant relationship on the dependent variable.

H_1: The macroeconomic variables examined have a significant relationship on the dependent variable.

One of the major concerns for these two approaches is the ordering of the variables. It is vital because the calculation will become significantly complicated with the same interpretations with the presence of two or more variables in the VAR System. Furthermore, it even consists of the problem of typical orthogonalization especially for the high frequency interrelated financial time series data (Panopoulou & Pantelidis, 2009). Moreover, Impulse Response refers to a unit shock regarding the errors of one VAR equation. However, it is impossible in reality due to the error terms are most likely to be correlated across other equations. Therefore, the accuracy level regarding both Impulse Response and Variance Decomposition still remain controversial (Brooks, 2008).

3.6 Conclusion

In conclusion, this research examines on the effects of four main independent variables such as inflation rate (INF), Money Supply (M2), Real Effective Exchange Rate (REER) and Financial Crisis (Dummy) on the stock market development in Malaysia. Normally, the data will be collected using the DataStream facility in UTAR Block G library. These variables will be examined using different tests which carry different purposes. It consists of Ordinary Least Squares (OLS) Method, T-Test, F-Test, Normality Test, Unit Root Test, Johansen

Co-integration Test, Granger Causality Test as well as Impulse Response Function and Variance Decomposition. The results of these tests will be interpreted in the next chapter.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

This chapter will focus on interpreting the empirical results from the methodologies stated in Chapter 3. In this chapter, the tests involved are Ordinary Least Squares (OLS) method, T-Test, F-Test, Normality Test, Unit Root Test which is subdivided into Augmented Dickey Fuller (ADF) Test and Phillips-Perron (PP) Test, Johansen Co-integration Test, Granger Causality Test, Variance Decomposition as well as Impulse Response Function. The results will be presented in table form followed by explanations and analysis.

4.1 Ordinary Least Squares (OLS) Method

$$LKLCI_t = -2.957199 + \underset{(0.006696)}{0.049803\,INF} + \underset{(0.023521)}{0.539205\,LM2} + \underset{(0.126217)}{0.568194\,LREER} - \underset{(0.080209)}{0.449299\,DUMMY}$$

Note: The value in parentheses represents the standard error for each independent variable.

4.1.1 T-Test

Hypothesis:

H_0: There is no significant relationship between independent and dependent variables (β_i = 0, i=1,2,3,4).

H_1: There is a significant relationship between independent and dependent variables ($\beta_i \neq 0$, i=1,2,3,4).

Level of Significance, α = 0.01

Decision Rule:

1). Null hypothesis is not rejected when P-value of T-test is higher than the level of significance, α.

2). Null hypothesis will be rejected when P-value of T-test is lower than the level of significance, α.

Conclusion:

Since P-value of T-test are 0.0000 (INF), 0.0000 (LM2), 0.0000 (LREER), 0.0000 (Dummy), which is lower than α = 0.01, the null hypothesis will be rejected indicating that there is a significant relationship between each independent variable and the dependent variable.

According to Khan et al. (2011), they discovered that inflation rate (INF) possesses negative relationship on stock returns. This result is consistent with the research conducted by Li et al. (2010) who stated that unpredictable inflation announcement negatively affects stock returns.

Besides that, Khan et al. (2011) demonstrated that there is a significant relationship between money supply and stock returns. This result is further supported by Sohail and Hussain (2012) who stated that money supply has negative impact on KSE 100 Index and ISE 10 Index but positive impact on LSE 25 Index in long run. Furthermore, Tsai (2012) determines a significant negative relationship between exchange rate and stock returns. However, Rahman and Uddin (2009) argued that there is no relationship between exchange rate and stock prices. Lastly, Mushtaq, Shah and Rehman (2012) found that financial crisis leads to a rise in the level of Foreign Direct Investments (FDI) in which it will increase the stock market volatility.

4.1.2 F-Test

Hypothesis:

H_0: The overall model is insignificant.

H_1: The overall model is significant.

Level of Significance, α = 0.01

Decision Rule:

1). Null hypothesis is not rejected when P-value of F-test is higher than the level of significance, α.

2). Null hypothesis will be rejected when P-value of F-test is lower than the level of significance, α.

Conclusion:

Since P-value of F-test is 0.0000 which is lower than $\alpha = 0.01$, the null hypothesis is rejected indicating that the overall model is significant.

4.2 Normality Test

Normality Residuals (Errors) Test	
Jarque-Bera Test Statistic = 7.403010	Probability = 0.024686

Table 4.2: Jarque-Bera (JB) Test

Hypothesis:

H_0: The error term is normally distributed.

H_1: The error term is not normally distributed.

Level of Significance, α = 0.01

Decision Rule:

1). Null hypothesis is not rejected when P-value of Jarque-Bera Statistics is higher than the level of significance, α.

2). Null hypothesis is rejected when P-value of Jarque-Bera Statistics is lower than the level of significance, α.

Conclusion:

Since P-value of Jarque-Bera Statistics is 0.024686 which is higher than α = 0.01, the null hypothesis is not rejected indicating that the error term is normally distributed.

4.3 Unit Root Test (ADF and PP Tests)

In order to ensure the significance of overall model and stationary between the variables, Unit Root Test needs to be applied to determine whether those variables are stationary. Stationary variable can be defined as variable with a constant mean, constant variance as well as constant auto covariance (Brooks, 2008). Stationary properties also means when there is a change in a variable during a particular time, the effect will continue for the following time which is t+1, t+2.

	Augmented Dickey Fuller (ADF) Test	***Phillips-Perron (PP) Test***
	Level	
Variables	*Constant without Trend*	*Constant without Trend*
LKLCI	-1.419766 (7)	-1.705036 (3)
INF	-3.254346 (13)	-3.253100 (3)
LM2	0.100561 (12)	-1.113630 (4)
LREER	-1.385533 (3)	-1.422298 (3)
DUMMY	-3.361207 (12)	-4.589706 (6) ***
	First Difference	
Variables	*Constant without Trend*	*Constant without Trend*
LKLCI	-7.339291 (6) ***	-17.25347 (6) ***
INF	-7.939924 (12) ***	-16.26609 (5) ***
LM2	-4.556745 (11) ***	-18.38856 (1) ***

LREER	-9.472799 (2) ***	-16.49399 (4) ***
DUMMY	-9.630680 (11) ***	-

Table 4.3: Unit Root Test

Note: *** denotes significant at 1% significance level and the rejection of null hypothesis.

Hypothesis:

$\boldsymbol{H_0}$**:** All variables are not stationary and have unit root.

$\boldsymbol{H_1}$**:** All variables are stationary and do not have unit root.

Level of Significance, α = 0.01

Decision Rule:

1). Null hypothesis is not rejected when P-value of Augmented Dickey Fuller (ADF) Test Statistics is higher than the level of significance, α.

2). Null hypothesis is rejected when P-value of Augmented Dickey Fuller (ADF) Test Statistics is lower than the level of significance, α.

Interpretation:

For the Augmented Dickey Fuller (ADF) Test as shown in Table 4.3, it is concluded that all variables are not stationary at level form and consist of unit root at level of significance, α = 0.01 due to the null hypothesis, H_0 is not rejected. According to Brooks (2008), non-stationary properties can lead to spurious result. Therefore, in order to ensure the variables are stationary, the first difference of variables needs to be tested if the level form is not satisfied. It is found that all variables are stationary and do not have unit root at level of significance, $\alpha = 0.01$. For Phillips-Perron (PP) Test, the result is slightly different for the dummy variable, financial crisis in which it is stationary at the level form at level of significance, $\alpha = 0.01$ while other variables possess the same stationary properties at first difference as the ones in ADF Test.

4.4 Johansen Co-integration Test

Johansen and Juselius (1990) developed Johansen Co-integration Test which is used to evaluate the presence of the long term co-integration relationship between LKLCI and its macroeconomic variables. Khan et al. (2011) clarified that Trace and Maximum Eigen Value Tests are used to determine the quantity of characteristics roots. Besides that, Pesaran, Shin and Smith (2001) proposed a new method for testing the existence of long run relationship which is called as conditional Autoregressive Distributed Lag (ARDL) and Error Correction Mechanism.

Hypothesized No. of CE(s)	Trace Statistic	Max-Eigen Statistic	Critical Values (5%)	
			Trace	*Max-Eigen*
$r = 0$	86.99883 ***	43.38779 ***	69.81889	33.87687
$r \leq 1$	43.61104	18.76133	47.85613	27.58434
$r \leq 2$	24.84971	14.85643	29.79707	21.13162
$r \leq 3$	9.993277	9.260727	15.49471	14.26460
$r \leq 4$	0.732550	0.732550	3.841466	3.841466

Table 4.4: Johansen-Juselius Co-integration Test

Note: *** denotes significant at 1% significance level and the rejection of null hypothesis.

Hypothesis:

H_0: There is no long run relationship between the variables (The variables are not co-integrated).

H_1: There is long run relationship between the variables (The variables are co-integrated).

Level of Significance, α = 0.01

Decision Rule:

1). Null hypothesis is not rejected when P-value is higher than the level of significance, α.

2). Null hypothesis will be rejected when P-value is lower than the level of significance, α.

Interpretation:

From Table 4.4, the result shows that both Trace and Max-Eigen Tests are co-integrated at $r = 0$ at level of significance, $\alpha = 0.01$. This result is based on the application of p-value in which the p-value for Trace Statistic and Max-Eigen Statistic are 0.0012 and 0.0028 respectively in which they are lower than the level of significance, $\alpha = 0.01$. Therefore, there is sufficient evidence to conclude that the null hypothesis is rejected and there is the existence of long run relationship between the variables at $\alpha = 0.01$.

4.5 Granger Causality Test

Granger Causality Test from the VECM model has been used in testing conditional macroeconomic variables in predicting stock market development in this research. By using VECM, the exogeneity and endogeneity of the model can be determined and the uni-directional or bi-directional causal effect characteristics can be identified (Zakaria & Shamsuddin, 2012b).

Dependent Variables	Independent Variables				
	$X^2 - Statistics\ of\ lagged\ 1st\ differenced\ term$				
	$\Delta\ LKLCI$	$\Delta\ INF$	$\Delta\ LM2$	$\Delta\ LREER$	$\Delta\ DUMMY$
$\Delta\ LKLCI$	-	14.70129 [0.6170]	21.34629 [0.2112]	28.87467 [0.0357]	13.84843 [0.6777]
$\Delta\ INF$	8.727851 [0.9484]	-	16.93130 [0.4590]	14.08250 [0.6613]	25.28178 [0.0886]
$\Delta\ LM2$	23.50424 [0.1335]	17.72589 [0.4063]	-	18.71212 [0.3453]	7.566028 [0.9750]
$\Delta\ LREER$	33.04474 [0.0111]	7.357743 [0.9784]	18.34243 [0.3676]	-	14.40275 [0.6384]
$\Delta\ DUMMY$	8.848274 [0.9449]	144.5523*** [0.0000]	20.79681 [0.2355]	15.56233 [0.5550]	-

Table 4.5: Granger Causality Results based on VECM

Note: *** denotes significant at 1% significance level. The figures above parenthesis indicate chi-square test statistic. The figures in parenthesis […] indicate p-value.

Hypothesis:

H_0: There is no granger cause relationship between each independent variable and dependent variable in short run.

H_1: There is granger cause relationship between each independent variable and dependent variable in short run.

4.5.1 Dependent Variable: Financial Crisis (Dummy)

Based on Table 4.5, assuming financial crisis (dummy variable) is the dependent variable, there is only one independent variable which is INF in which it has granger cause relationship with the dummy variable. Fouejieu (2013) indicates that inflation rate (INF) contributes to the existence of financial crisis. This is due to the P-value of Chi-Square Statistic of INF is 0.0000 which is lower than the level of significance, $\alpha = 0.01$. As a result, the null hypothesis is rejected.

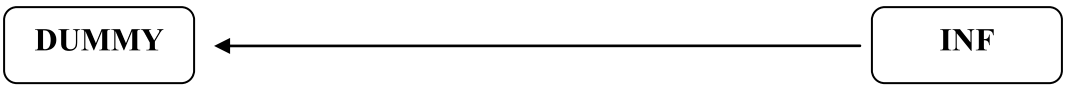


Figure 4.5: The relationship between each variable for Granger Causality Test

Conclusion:

Based on Figure 4.5, it is found that INF possesses uni-directional short run causal relationship with financial crisis (dummy variable).

4.6 Variance Decomposition

Variance Decomposition investigates how much the forecasted error variance of each variable influence other variables in a model. The purpose of this test is to provide the proportion of movements in dependent variable caused by its "own" shocks compared to the unpredictable changes to other variables (Brooks, 2008).

Period	SE	LKLCI	INF	LM2	LREER	DUMMY
1	0.072166	100.00000	0.000000	0.000000	0.000000	0.000000
2	0.108828	99.01257	0.235458	0.132351	0.594105	**0.025519**
3	0.140312	98.04217	0.701696	0.574213	0.646051	0.035869
4	0.162593	96.53739	1.048057	0.966805	1.408388	0.039358
5	0.181654	94.27660	2.273841	1.771909	1.613402	0.064252
6	0.197943	92.57987	3.344673	2.162441	1.703599	0.209418
7	0.210424	90.54967	4.710127	2.770023	1.537150	0.433027
8	0.224315	89.40857	5.492476	2.670903	1.772154	0.655899
9	0.237804	87.96309	6.390971	2.591876	2.253482	0.800585
10	0.253487	86.58734	**6.875708**	2.319980	3.192576	1.024398

Table 4.6: Variance Decomposition of LKLCI towards INF, LM2, LREER and Dummy

Hypothesis:

H_0: INF/ LM2/ LREER/ Dummy does not have an impact on LKLCI.

H_1: INF/ LM2/ LREER/ Dummy has an impact on LKLCI.

Interpretation:

From Table 4.6, the result shows that the shock in the inflation rate (INF) possesses larger impact of 6.875708% in LKLCI in period 10 compared to financial crisis (dummy variable) which possesses a small proportion of 0.025519% impact to LKLCI in Period 2.

4.7 Impulse Response Function

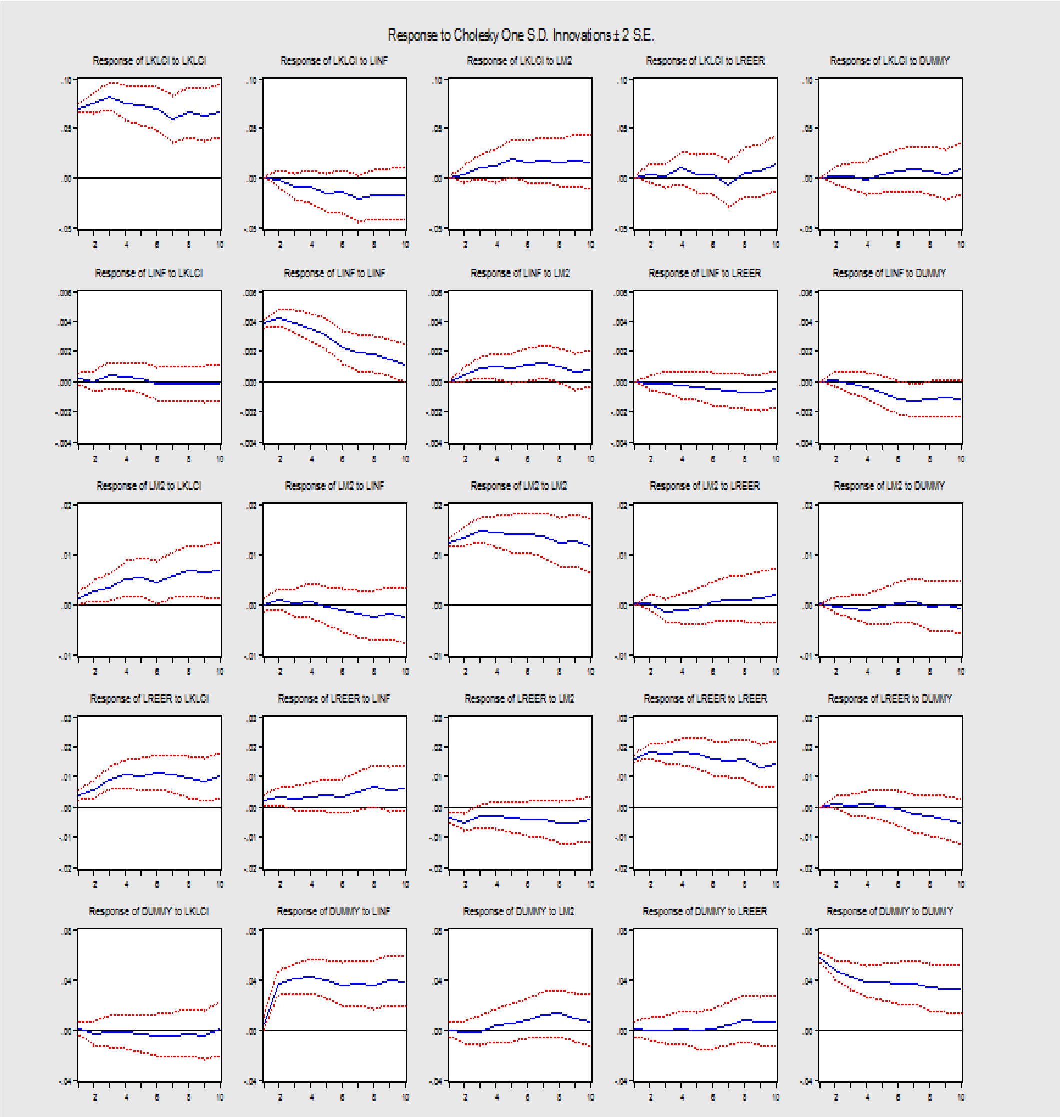


Figure 4.7: Impulse Response Function

The result of Impulse Response Function regarding the impact of different macroeconomic variables on LKLCI is demonstrated clearly in Figure 4.7.

Impulse Response Function can be used to trace out the responsiveness of the dependent variables which will influence each of the variables. This test can overcome the limitation of F-Test which is not able to explain the sign of the relationship as well as the duration of the effect which continues to take place (Brooks, 2008).

4.8 Conclusion

The data analysis undergoes the Unit Root Test, Johansen Co-integration Test, Granger Causality test, Variance Decomposition as well as Impulse Response Function in order to check the results of different tests executed. Moreover, tables, and figures are shown in order to conclude and interpret the results. Besides that, further discussions, implications and recommendations will be presented in the following chapter.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

The objective in this paper is to examine the impacts of macroeconomic variables on Malaysia Stock Market Development (MSMD) from 1980 to 2013. Numerous studies have been conducted to investigate the connections of independent and dependent variables using various methodologies. The summary of major findings from previous chapter will be presented with precise explanations in the first section, followed by policy implications, as well as the limitations from the selected studies. This chapter will be ended with suitable recommendations outlined for future researchers and conclusion to wrap up the contents explained.

5.1 Summary and Discussions of Major Findings

T-Test		
Variables	**P-value**	**Results**
Inflation Rate (INF)	0.0000	Significant at 1% (Positive).
Money Supply (LM2)	0.0000	Significant at 1% (Positive).
Real Effective Exchange Rate (LREER)	0.0000	Significant at 1% (Positive).
Financial Crisis (Dummy)	0.0000	Significant at 1% (Negative).
F-Test		
Overall Significance of Model	0.0000	Significant at 1%.

Normality Test		
Jarque-Bera Test	0.024686	Error term is normally distributed.

Table 5.1.1: Results of OLS Regression

Table 5.1.1 indicates the relationship between macroeconomic variables and stock market development (LKLCI) in Malaysia. Based on T-test results, it demonstrates that money supply (M2) and Real Effective Exchange Rate (REER) possess positive relationship at 1% level of significance in which it is consistent with the research conducted by Sohail and Hussain (2012). Besides that, Du (2006) demonstrated that inflation rate (INF) carries positive relationship with stock returns in which it is consistent with this research result. On the other hand, financial crisis (Dummy) possesses significant negative relationship with the stock market development at 1% level of significance. Schwert (2011) stated that financial crisis which happened in year 2008 was considered as a major disruption to the stock market development and financial sector.

Last but not least, F-test result and Jarque-Bera test show that the overall model is significant and the error term is normally distributed respectively.

Variables	**Unit Root Test**
LKLCI	Stationary at first difference
INF	Stationary at first difference
LM2	Stationary at first difference
LREER	Stationary at first difference
Dummy	Stationary at first difference (ADF Test), level form (PP Test)

Table 5.1.2: Summary of Unit Root Test

For Unit Root Test, it is subdivided into Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) Tests. Based on the results obtained in chapter 4, it is concluded that the results for ADF and PP tests are slightly different for the dummy variable which is financial crisis. For LKLCI, INF, LM2 and LREER, these 4 variables are stationary at the first difference no matter they are carried out using ADF or PP tests. However, ADF test shows that financial crisis is stationary at the first difference whereas PP test shows that this variable is stationary at the level form. In overall, the variables are not stationary at the level form but they are stationary after the first difference.

Dependent Variable	**Independent Variables**				
	LKLCI	INF	LM2	LREER	Dummy
LKLCI		-	-	-	-
INF	-		-	-	-
LM2	-	-		-	-
LREER	-	-	-		-
Dummy	-	1%	-	-	

Table 5.1.3: Summary of Granger Causality Test

Based on Table 5.1.3, inflation rate (INF) demonstrates uni-lateral short run relationship with financial crisis (Dummy) at 1% level of significance. Bittencourt (2011) stated that inflation rate (INF) is the major cause of poor economic and financial performance in which it contributes to the existence of financial crisis slowly.

Besides that, there is another test which is Variance Decomposition in which it demonstrates that inflation rate (INF) possesses larger impact on Malaysia Stock Market Development (MSMD) in short run when comparing with other macroeconomic variables. This indicates that the ***general objective*** which is the determination of the most influential factor on Malaysia Stock Market Development (MSMD) from 1980 to 2013 is achieved.

Johansen Co-integration Test	
Trace Test	*Max Eigenvalue Test*
Co-integrated at r = 0	Co-integrated at r = 0

Table 5.1.4: Summary of Johansen Co-integration Test

Based on Table 5.1.4, it is concluded that both Trace and Max-Eigen Tests are co-integrated at r = 0 at 1% level of significance. Therefore, it indicates the existence of long run relationship between the variables.

Based on the summary and discussion of the major findings about different tests, it clearly shows that the hypotheses which are developed in chapter 1 are achieved due to this research fully supports the alternative hypothesis and all the null hypotheses are rejected in this case. Furthermore, all the ***specific objectives*** have been achieved in which all the macroeconomic variables do carry significant impacts on the dependent variable which is Malaysia Stock Market Development (MSMD).

5.2 Implications of the Study

In this study, the macroeconomic factors namely inflation rate (INF), money supply (M2), Real Effective Exchange Rate (REER) and financial crisis (Dummy) affecting the Malaysia Stock Market Development (MSMD) from 1980 to 2013 were tightly scrutinized. As such, it was determined that the conducted research imposes significant benefits to a few identifiable groups like the Malaysian government, investors as well as policymakers.

First and foremost, the stock market efficiency and financial stability can be further enhanced by the *Malaysia government.* This has been clearly elaborated when this study determined valid evidence from previous researchers stating that government policies that are launched accordingly are able to stimulate stock market development and a positive economic growth. It has also been suggested that the utilization of equity shares as a leading financial instrument ought to be prioritized by the government. Through this research, it was found that money supply being one of the macroeconomic factors promotes relevant effects in facilitating the growth and stability of stock market. With the Malaysia government working hand in hand with Bank Negara Malaysia (BNM), monetary policy can be adjusted accordingly when the effects of money supply on the stock market development is not apparent. In accordance to the previous objectives, the inflation rate (INF) should also be simultaneously maintained at a reasonable level with other macroeconomic variables in order to enhance the stock market performance. All in all, it is undeniable that this research will give the Malaysia government a deeper understanding about the effects from the various macroeconomic variables on the stock market development in Malaysia. In addition, additional legislative rules can be modified according to the requirements of current financial trend in order to provide better job opportunities, improve productivity in which it assists in creating a better investment condition for the nation.

Moving on, *local and foreign investors* were able to attain advantages from the research conducted. Having the sufficient knowledge on how the different macroeconomic factors influence stock market development will provide them a better judgment and insight to determine their desired investment portfolio. The stock market is deeply impacted by the fluctuations in the foreign exchange market. Having ample of knowledge on the correlation between Real Effective Exchange Rate (REER) and Malaysia Stock Market Development (MSMD) will definitely help investors in executing the appropriate trades to realize their investment goals. In fact, they should be aware of the changes in exchange rate which can affect their stock market returns. At the same time, they can develop better strategies based on the current stock market trend.

Last but not least, *the policymakers* will be able to outline recommendations to the government regarding the relaxation of inflationary pressures to the public in order to boost up demand to a desirable level in stock market. The global financial crisis does affect Malaysia Stock Market Development (MSMD) negatively. Hence, the policymakers can conclude a better understanding about the effects of global financial crisis and cooperate with the government in undertaking this global issue. Therefore, it shows that Malaysia government and the policymakers play the main roles in promoting a favorable business environment so that the foreign investors need not worry about the legal and financial structure of Malaysia before making any investments.

5.3 Limitations of the Study

There are some limitations encountered in this final year project. One of the limitations is regarding the tests used. Due to the inadequacy of knowledge, it is difficult to conduct Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model which is quite useful to be applied in detecting the fluctuations in stock price because of the challenge faced in applying and interpreting the findings from this test. At the same time, for the Unit Root Test, the results of Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) Tests are slightly different in terms of dummy variable which is financial crisis. Last but not least, the results of this research might not be fully accurate due to certain independent variable like inflation rate (INF) can affect another independent variable which is financial crisis (Dummy).

Moreover, this research is conducted in one developing country which is Malaysia. The results obtained do not necessarily reflect the characteristics of stock markets in other developing countries. Besides that, it is incapable to include other developing or developed countries in addition with too much independent variables into this research in order to compare and contrast their effects due to the limited durations (two long semesters). Furthermore, there is only one type of financial crisis which can be included under the same type of dummy variable. It means the effects of one crisis on stock market development can only be examined. In this research, U.S. subprime crisis is one of the most recent global financial crisis around year 2008 and 2009 in which it is focused on due to it provides significant impacts to Malaysia Stock Market Development (MSMD).

5.4 Recommendations for Future Research

One of the recommendations provided to the future researchers is they can apply the use of panel data instead of time series data due to panel data brings certain advantages and solves the weaknesses of time series data such as it possesses more degrees of freedom and multi-dimensional data over multiple time periods in which it can tackle the problem of time series data which mainly focuses on one dimensional data only. Moreover, it can be used to detect the complexity of model. For instance, it can manage aggregate individuals or firms as well as technological changes accurately compared to time series data which can only focus on individual outcomes. As a result, panel data is better to be used in examining the dynamics of changes (Paul, n.d.). The second recommendation the future researchers should apply the use of quarterly data to examine on the impacts of macroeconomic variables on the stock market development. The first reason is previous researchers mainly focus on monthly data instead of quarterly data. Besides that, the second reason is different frequencies in dataset do provide different views in the research results with respect to the research title in which it facilitates the comparisons of research.

Moreover, if future researchers possess sufficient knowledge, they should proceed to other kinds of advanced tests like Generalized Autoregressive Conditional Heteroscedasticy (GARCH) test in order to improve the accuracy of research results. Nowadays, there are different macroeconomic variables which can deliver significant impacts to stock market and it is difficult to include all these macroeconomic variables. However, future researchers are recommended to include as more independent variables as possible to avoid the biasness of results. Last but not least, they can even compare the research conducted in one developing country (Eg: Malaysia Stock Market Development) with other developing countries due to certain effective policies which are implemented in other developing countries might be applied in Malaysia as well. Hence, it is useful in facilitating the inflow of useful financial information in which the domestic citizens can utilize it to make wise investment decisions.

5.5 Conclusion

In conclusion, this research shows that among 4 independent variables examined, financial crisis (Dummy) demonstrate significant negative relationship to Malaysia Stock Market Development (MSMD). On the contrary, inflation rate (INF), money supply (M2) and Real Effective Exchange Rate (REER) show significant positive relationship to Malaysia Stock Market Development (MSMD). Furthermore, the main objective of this research study which is the determination of the most influential factors on stock market development is achieved successfully. This can be supported with inflation rate (INF) carries the larger impact on Malaysia Stock Market Development (MSMD) compared to other independent variables based on the results of Variance Decomposition. Last but not least, the impacts of macroeconomic variables on stock market development for both short run and long run dynamics in Malaysia are examined too by applying different tests.

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APPENDICES

APPENDIX 1: ORDINARY LEAST SQUARES (OLS) METHOD

Dependent Variable: LKLCI

Method: Least Squares

Date: 08/03/13 Time: 21:27

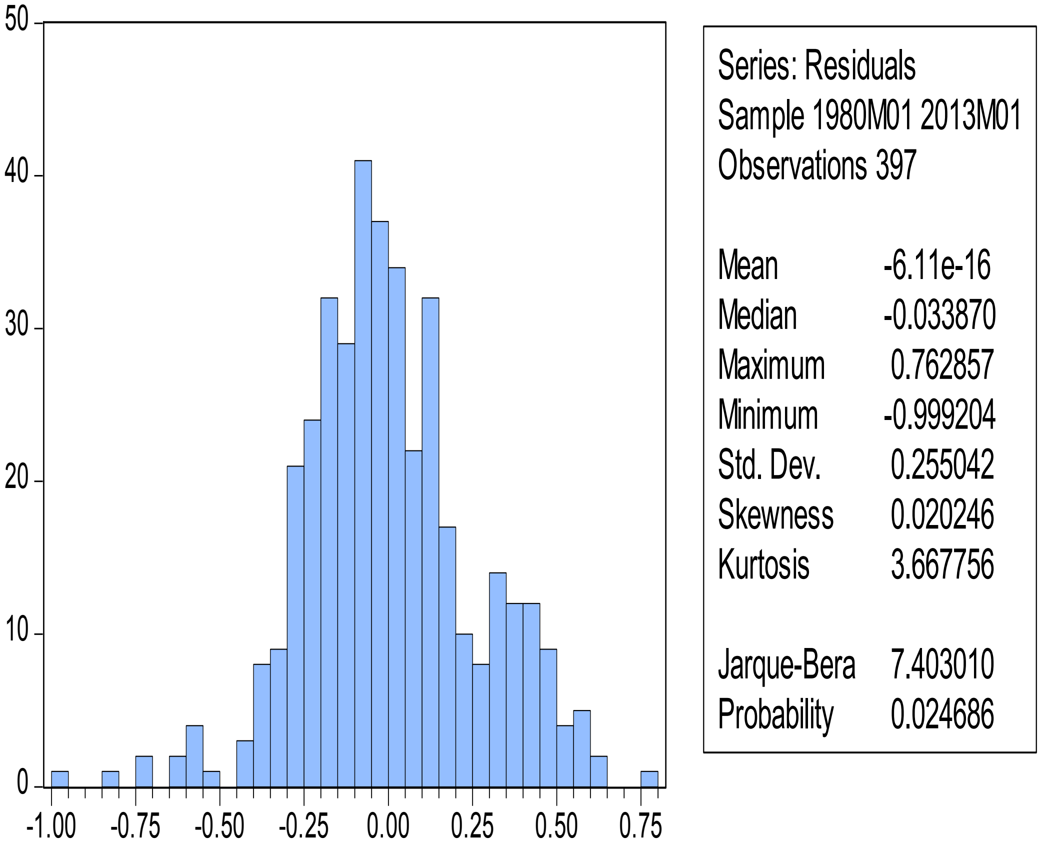
Sample: 1980M01 2013M01

Included observations: 397

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	0.049803	0.006696	7.437674	0.0000
LM2	0.539205	0.023521	22.92426	0.0000
LREER	0.568194	0.126217	4.501723	0.0000
DUMMY	-0.449299	0.080209	-5.601635	0.0000
C	-2.957199	0.870446	-3.397337	0.0008

R-squared	0.790435	Mean dependent var	6.485432
Adjusted R-squared	0.788296	S.D. dependent var	0.557123
S.E. of regression	0.256339	Akaike info criterion	0.127886
Sum squared resid	25.75829	Schwarz criterion	0.178062
Log likelihood	-20.38541	Hannan-Quinn criter.	0.147762
F-statistic	369.6351	Durbin-Watson stat	0.104388
Prob(F-statistic)	0.000000		

APPENDIX 2: NORMALITY TEST



APPENDIX 3: UNIT ROOT TEST

(I). Augmented Dickey Fuller (ADF) Test

Dependent Variable: LKLCI

- ***Level :***

Null Hypothesis: LKLCI has a unit root
Exogenous: Constant
Lag Length: 7 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.419766	0.5731
Test critical values:	1% level	-3.446949	
	5% level	-2.868751	
	10% level	-2.570678	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LKLCI)
Method: Least Squares
Date: 08/03/13 Time: 21:35
Sample (adjusted): 1980M09 2013M01
Included observations: 389 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LKLCI(-1)	-0.010110	0.007121	-1.419766	0.1565
D(LKLCI(-1))	0.145858	0.051037	2.857872	0.0045
D(LKLCI(-2))	0.136844	0.051316	2.666691	0.0080
D(LKLCI(-3))	-0.132860	0.051821	-2.563808	0.0107
D(LKLCI(-4))	-0.019541	0.052126	-0.374883	0.7080
D(LKLCI(-5))	0.024909	0.051624	0.482515	0.6297
D(LKLCI(-6))	-0.091349	0.051124	-1.786830	0.0748
D(LKLCI(-7))	0.099660	0.050755	1.963537	0.0503
C	0.069205	0.046329	1.493777	0.1361

R-squared	0.071665	Mean dependent var	0.004215
Adjusted R-squared	0.052121	S.D. dependent var	0.077004
S.E. of regression	0.074971	Akaike info criterion	-2.320577
Sum squared resid	2.135825	Schwarz criterion	-2.228874
Log likelihood	460.3522	Hannan-Quinn criter.	-2.284222
F-statistic	3.666879	Durbin-Watson stat	1.989088
Prob(F-statistic)	0.000391		

➢ *First Difference:*

Null Hypothesis: D(LKLCI) has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.339291	0.0000
Test critical values:	1% level	-3.446949	
	5% level	-2.868751	
	10% level	-2.570678	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LKLCI,2)
Method: Least Squares
Date: 08/03/13 Time: 21:44
Sample (adjusted): 1980M09 2013M01
Included observations: 389 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LKLCI(-1))	-0.871374	0.118727	-7.339291	0.0000
D(LKLCI(-1),2)	0.011979	0.108273	0.110635	0.9120
D(LKLCI(-2),2)	0.143720	0.098838	1.454102	0.1467
D(LKLCI(-3),2)	0.004756	0.088179	0.053934	0.9570
D(LKLCI(-4),2)	-0.019578	0.076530	-0.255821	0.7982
D(LKLCI(-5),2)	0.001568	0.067011	0.023397	0.9813
D(LKLCI(-6),2)	-0.094800	0.050707	-1.869558	0.0623
C	0.003656	0.003848	0.949935	0.3427

R-squared	0.459587	Mean dependent var	-0.000243
Adjusted R-squared	0.449659	S.D. dependent var	0.101194
S.E. of regression	0.075070	Akaike info criterion	-2.320428
Sum squared resid	2.147155	Schwarz criterion	-2.238914
Log likelihood	459.3232	Hannan-Quinn criter.	-2.288112
F-statistic	46.28811	Durbin-Watson stat	1.988385
Prob(F-statistic)	0.000000		

Independent Variable: INF

- ***Level:***

Null Hypothesis: INF has a unit root
Exogenous: Constant
Lag Length: 13 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.254346	0.0178
Test critical values:	1% level	-3.447214	
	5% level	-2.868868	
	10% level	-2.570740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 08/03/13 Time: 21:48
Sample (adjusted): 1981M03 2013M01
Included observations: 383 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.044260	0.013600	-3.254346	0.0012
D(INF(-1))	0.258928	0.050919	5.085103	0.0000
D(INF(-2))	0.065703	0.045368	1.448233	0.1484
D(INF(-3))	-0.029658	0.045085	-0.657822	0.5111
D(INF(-4))	0.094090	0.044958	2.092847	0.0370
D(INF(-5))	-0.056439	0.045036	-1.253185	0.2109
D(INF(-6))	-0.033706	0.044605	-0.755647	0.4503
D(INF(-7))	0.082149	0.044579	1.842767	0.0662
D(INF(-8))	0.034869	0.044648	0.780976	0.4353
D(INF(-9))	-0.019754	0.044423	-0.444668	0.6568
D(INF(-10))	0.031929	0.044330	0.720258	0.4718
D(INF(-11))	0.011393	0.044154	0.258030	0.7965
D(INF(-12))	-0.472602	0.044157	-10.70265	0.0000
D(INF(-13))	0.171622	0.049257	3.484210	0.0006
C	0.115065	0.047467	2.424122	0.0158

R-squared	0.338446	Mean dependent var	-0.019896
Adjusted R-squared	0.313278	S.D. dependent var	0.551916
S.E. of regression	0.457365	Akaike info criterion	1.311708
Sum squared resid	76.97937	Schwarz criterion	1.466331
Log likelihood	-236.1922	Hannan-Quinn criter.	1.373045
F-statistic	13.44756	Durbin-Watson stat	2.028369
Prob(F-statistic)	0.000000		

➢ *First Difference:*

Null Hypothesis: D(INF) has a unit root
Exogenous: Constant
Lag Length: 12 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.939924	0.0000
Test critical values:	1% level	-3.447214	
	5% level	-2.868868	
	10% level	-2.570740	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 08/03/13 Time: 21:52
Sample (adjusted): 1981M03 2013M01
Included observations: 383 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-1.120993	0.141184	-7.939924	0.0000
D(INF(-1),2)	0.359120	0.124814	2.877241	0.0042
D(INF(-2),2)	0.403816	0.119785	3.371165	0.0008
D(INF(-3),2)	0.354311	0.114738	3.088005	0.0022
D(INF(-4),2)	0.427593	0.108974	3.923796	0.0001
D(INF(-5),2)	0.347348	0.104666	3.318640	0.0010
D(INF(-6),2)	0.294300	0.098538	2.986670	0.0030
D(INF(-7),2)	0.357100	0.090220	3.958109	0.0001
D(INF(-8),2)	0.371266	0.083223	4.461116	0.0000
D(INF(-9),2)	0.330460	0.077789	4.248189	0.0000
D(INF(-10),2)	0.340700	0.069439	4.906482	0.0000
D(INF(-11),2)	0.331832	0.060866	5.451874	0.0000
D(INF(-12),2)	-0.160655	0.049776	-3.227539	0.0014
C	-0.019249	0.023748	-0.810547	0.4181

R-squared	0.571460	Mean dependent var	-0.002324
Adjusted R-squared	0.556363	S.D. dependent var	0.695538
S.E. of regression	0.463271	Akaike info criterion	1.334859
Sum squared resid	79.19478	Schwarz criterion	1.479174
Log likelihood	-241.6256	Hannan-Quinn criter.	1.392107
F-statistic	37.85104	Durbin-Watson stat	2.016982
Prob(F-statistic)	0.000000		

Independent Variable: LM2

- ***Level:***

Null Hypothesis: LM2 has a unit root
Exogenous: Constant
Lag Length: 12 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.100561	0.9655
Test critical values:	1% level	-3.447169	
	5% level	-2.868848	
	10% level	-2.570730	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LM2)
Method: Least Squares
Date: 08/03/13 Time: 21:55
Sample (adjusted): 1981M02 2013M01
Included observations: 384 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LM2(-1)	5.72E-05	0.000568	0.100561	0.9200
D(LM2(-1))	0.016981	0.049555	0.342668	0.7320
D(LM2(-2))	0.061891	0.048918	1.265190	0.2066
D(LM2(-3))	0.002988	0.049014	0.060957	0.9514
D(LM2(-4))	-0.021484	0.048940	-0.438977	0.6609
D(LM2(-5))	0.025137	0.048773	0.515392	0.6066
D(LM2(-6))	0.004351	0.048606	0.089518	0.9287
D(LM2(-7))	-0.088896	0.048585	-1.829704	0.0681
D(LM2(-8))	0.052314	0.048726	1.073636	0.2837
D(LM2(-9))	-0.081575	0.048809	-1.671310	0.0955
D(LM2(-10))	-0.023565	0.048712	-0.483755	0.6288
D(LM2(-11))	0.121667	0.048532	2.506956	0.0126
D(LM2(-12))	0.243993	0.048757	5.004234	0.0000
C	0.005981	0.007233	0.826916	0.4088

R-squared	0.105662	Mean dependent var	0.009951
Adjusted R-squared	0.074240	S.D. dependent var	0.013255
S.E. of regression	0.012753	Akaike info criterion	-5.850301
Sum squared resid	0.060178	Schwarz criterion	-5.706267
Log likelihood	1137.258	Hannan-Quinn criter.	-5.793171
F-statistic	3.362619	Durbin-Watson stat	1.899075
Prob(F-statistic)	0.000067		

➢ *First Difference:*

Null Hypothesis: D(LM2) has a unit root
Exogenous: Constant
Lag Length: 11 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.556745	0.0002
Test critical values:	1% level	-3.447169	
	5% level	-2.868848	
	10% level	-2.570730	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LM2,2)
Method: Least Squares
Date: 08/03/13 Time: 21:55
Sample (adjusted): 1981M02 2013M01
Included observations: 384 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LM2(-1))	-0.687156	0.150800	-4.556745	0.0000
D(LM2(-1),2)	-0.295909	0.145959	-2.027345	0.0433
D(LM2(-2),2)	-0.234104	0.138764	-1.687057	0.0924
D(LM2(-3),2)	-0.231203	0.131072	-1.763943	0.0786
D(LM2(-4),2)	-0.252751	0.123872	-2.040419	0.0420
D(LM2(-5),2)	-0.227668	0.114769	-1.983699	0.0480
D(LM2(-6),2)	-0.223360	0.106503	-2.097222	0.0367
D(LM2(-7),2)	-0.312304	0.097354	-3.207920	0.0015
D(LM2(-8),2)	-0.260064	0.087617	-2.968204	0.0032
D(LM2(-9),2)	-0.341703	0.076909	-4.442937	0.0000
D(LM2(-10),2)	-0.365380	0.065706	-5.560793	0.0000
D(LM2(-11),2)	-0.243838	0.048668	-5.010242	0.0000
C	0.006689	0.001672	4.000968	0.0001

R-squared	0.535277	Mean dependent var	-0.000106
Adjusted R-squared	0.520246	S.D. dependent var	0.018388
S.E. of regression	0.012736	Akaike info criterion	-5.855482
Sum squared resid	0.060179	Schwarz criterion	-5.721736
Log likelihood	1137.253	Hannan-Quinn criter.	-5.802433
F-statistic	35.61047	Durbin-Watson stat	1.898825
Prob(F-statistic)	0.000000		

Independent Variable: LREER

- ***Level:***

Null Hypothesis: LREER has a unit root

Exogenous: Constant

Lag Length: 3 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.385533	0.5899
Test critical values:	1% level	-3.446777	
	5% level	-2.868676	
	10% level	-2.570637	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LREER)

Method: Least Squares

Date: 08/03/13 Time: 21:58

Sample (adjusted): 1980M05 2013M01

Included observations: 393 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LREER(-1)	-0.005521	0.003985	-1.385533	0.1667
D(LREER(-1))	0.197285	0.050028	3.943490	0.0001
D(LREER(-2))	-0.059526	0.050926	-1.168876	0.2432
D(LREER(-3))	0.140940	0.050045	2.816265	0.0051
C	0.025978	0.019309	1.345407	0.1793

R-squared	0.059140	Mean dependent var	-0.001075
Adjusted R-squared	0.049440	S.D. dependent var	0.017122
S.E. of regression	0.016693	Akaike info criterion	-5.335006
Sum squared resid	0.108119	Schwarz criterion	-5.284449
Log likelihood	1053.329	Hannan-Quinn criter.	-5.314971
F-statistic	6.097176	Durbin-Watson stat	1.984215
Prob(F-statistic)	0.000091		

➢ *First Difference:*

Null Hypothesis: D(LREER) has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.472799	0.0000
Test critical values:	1% level	-3.446777	
	5% level	-2.868676	
	10% level	-2.570637	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LREER,2)

Method: Least Squares

Date: 08/03/13 Time: 22:00

Sample (adjusted): 1980M05 2013M01

Included observations: 393 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LREER(-1))	-0.725051	0.076540	-9.472799	0.0000
D(LREER(-1),2)	-0.078292	0.064351	-1.216647	0.2245
D(LREER(-2),2)	-0.139283	0.050090	-2.780669	0.0057
C	-0.000749	0.000848	-0.883418	0.3776

R-squared	0.420714	Mean dependent var	0.000102
Adjusted R-squared	0.416246	S.D. dependent var	0.021874
S.E. of regression	0.016713	Akaike info criterion	-5.335160
Sum squared resid	0.108654	Schwarz criterion	-5.294714
Log likelihood	1052.359	Hannan-Quinn criter.	-5.319131
F-statistic	94.17194	Durbin-Watson stat	1.984285
Prob(F-statistic)	0.000000		

Independent Variable: Dummy (Financial Crisis)

- ***Level:***

Null Hypothesis: DUMMY has a unit root
Exogenous: Constant
Lag Length: 12 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.361207	0.0130
Test critical values:	1% level	-3.447169	
	5% level	-2.868848	
	10% level	-2.570730	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DUMMY)
Method: Least Squares
Date: 08/03/13 Time: 22:01
Sample (adjusted): 1981M02 2013M01
Included observations: 384 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DUMMY(-1)	-0.088889	0.026446	-3.361207	0.0009
D(DUMMY(-1))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-2))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-3))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-4))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-5))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-6))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-7))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-8))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-9))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-10))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-11))	0.044444	0.046280	0.960345	0.3375
D(DUMMY(-12))	-0.455556	0.046280	-9.843534	0.0000
C	0.002778	0.003306	0.840302	0.4013

R-squared	0.272222	Mean dependent var	0.000000
Adjusted R-squared	0.246652	S.D. dependent var	0.072263
S.E. of regression	0.062721	Akaike info criterion	-2.664461
Sum squared resid	1.455556	Schwarz criterion	-2.520427
Log likelihood	525.5765	Hannan-Quinn criter.	-2.607331
F-statistic	10.64592	Durbin-Watson stat	1.972180
Prob(F-statistic)	0.000000		

➢ ***First Difference:***

Null Hypothesis: D(DUMMY) has a unit root
Exogenous: Constant
Lag Length: 11 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.630680	0.0000
Test critical values:	1% level	-3.447169	
	5% level	-2.868848	
	10% level	-2.570730	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DUMMY,2)
Method: Least Squares
Date: 08/03/13 Time: 22:04
Sample (adjusted): 1981M02 2013M01
Included observations: 384 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DUMMY(-1))	-1.500000	0.155752	-9.630680	0.0000
D(DUMMY(-1),2)	0.500000	0.149121	3.352972	0.0009
D(DUMMY(-2),2)	0.500000	0.142182	3.516627	0.0005
D(DUMMY(-3),2)	0.500000	0.134885	3.706851	0.0002
D(DUMMY(-4),2)	0.500000	0.127171	3.931709	0.0001
D(DUMMY(-5),2)	0.500000	0.118958	4.203173	0.0000
D(DUMMY(-6),2)	0.500000	0.110133	4.539946	0.0000
D(DUMMY(-7),2)	0.500000	0.100538	4.973262	0.0000
D(DUMMY(-8),2)	0.500000	0.089924	5.560276	0.0000
D(DUMMY(-9),2)	0.500000	0.077876	6.420453	0.0000
D(DUMMY(-10),2)	0.500000	0.063586	7.863417	0.0000
D(DUMMY(-11),2)	0.500000	0.044962	11.12055	0.0000
C	0.000000	0.003245	0.000000	1.0000

R-squared	0.625000	Mean dependent var	0.000000
Adjusted R-squared	0.612871	S.D. dependent var	0.102195
S.E. of regression	0.063586	Akaike info criterion	-2.639592
Sum squared resid	1.500000	Schwarz criterion	-2.505846
Log likelihood	519.8017	Hannan-Quinn criter.	-2.586543
F-statistic	51.52778	Durbin-Watson stat	2.000000
Prob(F-statistic)	0.000000		

(II). Phillips-Perron (PP) Test:

Dependent Variable: LKLCI

- ***Level:***

Null Hypothesis: LKLCI has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.705036	0.4280
Test critical values:	1% level	-3.446650	
	5% level	-2.868620	
	10% level	-2.570607	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.005850
HAC corrected variance (Bartlett kernel)	0.007621

Phillips-Perron Test Equation
Dependent Variable: D(LKLCI)
Method: Least Squares
Date: 08/03/13 Time: 22:07
Sample (adjusted): 1980M02 2013M01
Included observations: 396 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LKLCI(-1)	-0.010626	0.006940	-1.531174	0.1265
C	0.073824	0.045157	1.634843	0.1029

R-squared	0.005915	Mean dependent var	0.004934
Adjusted R-squared	0.003392	S.D. dependent var	0.076810
S.E. of regression	0.076679	Akaike info criterion	-2.293335
Sum squared resid	2.316602	Schwarz criterion	-2.273226
Log likelihood	456.0803	Hannan-Quinn criter.	-2.285368
F-statistic	2.344494	Durbin-Watson stat	1.716161
Prob(F-statistic)	0.126529		

- ***First Difference:***

Null Hypothesis: D(LKLCI) has a unit root

Exogenous: Constant

Bandwidth: 6 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-17.25347	0.0000
Test critical values:	1% level	-3.446692	
	5% level	-2.868638	
	10% level	-2.570617	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.005778
HAC corrected variance (Bartlett kernel)	0.005593

Phillips-Perron Test Equation

Dependent Variable: D(LKLCI,2)

Method: Least Squares

Date: 08/03/13 Time: 22:08

Sample (adjusted): 1980M03 2013M01

Included observations: 395 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LKLCI(-1))	-0.863413	0.049938	-17.28985	0.0000
C	0.004070	0.003842	1.059288	0.2901

R-squared	0.432031	Mean dependent var	-0.000281
Adjusted R-squared	0.430585	S.D. dependent var	0.100986
S.E. of regression	0.076204	Akaike info criterion	-2.305759
Sum squared resid	2.282162	Schwarz criterion	-2.285613
Log likelihood	457.3874	Hannan-Quinn criter.	-2.297777
F-statistic	298.9388	Durbin-Watson stat	2.021409
Prob(F-statistic)	0.000000		

Independent Variable: INF

- ***Level:***

Null Hypothesis: INF has a unit root

Exogenous: Constant

Bandwidth: 3 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.253100	0.0178
Test critical values:	1% level	-3.446650	
	5% level	-2.868620	
	10% level	-2.570607	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.304489
HAC corrected variance (Bartlett kernel)	0.426863

Phillips-Perron Test Equation

Dependent Variable: D(INF)

Method: Least Squares

Date: 08/03/13 Time: 22:09

Sample (adjusted): 1980M02 2013M01

Included observations: 396 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.036908	0.013140	-2.808709	0.0052
C	0.101067	0.049128	2.057228	0.0403

R-squared	0.019629	Mean dependent var	-0.012702
Adjusted R-squared	0.017141	S.D. dependent var	0.558007
S.E. of regression	0.553204	Akaike info criterion	1.658859
Sum squared resid	120.5777	Schwarz criterion	1.678967
Log likelihood	-326.4540	Hannan-Quinn criter.	1.666825
F-statistic	7.888848	Durbin-Watson stat	1.578012
Prob(F-statistic)	0.005222		

➢ *First Difference:*

Null Hypothesis: D(INF) has a unit root

Exogenous: Constant

Bandwidth: 5 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-16.26609	0.0000
Test critical values:	1% level	-3.446692	
	5% level	-2.868638	
	10% level	-2.570617	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.299225
HAC corrected variance (Bartlett kernel)	0.306196

Phillips-Perron Test Equation

Dependent Variable: D(INF,2)

Method: Least Squares

Date: 08/03/13 Time: 22:12

Sample (adjusted): 1980M03 2013M01

Included observations: 395 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-0.802479	0.049452	-16.22752	0.0000
C	-0.010123	0.027601	-0.366776	0.7140

R-squared	0.401218	Mean dependent var	0.000278
Adjusted R-squared	0.399694	S.D. dependent var	0.707807
S.E. of regression	0.548405	Akaike info criterion	1.641444
Sum squared resid	118.1939	Schwarz criterion	1.661590
Log likelihood	-322.1852	Hannan-Quinn criter.	1.649426
F-statistic	263.3323	Durbin-Watson stat	2.005761
Prob(F-statistic)	0.000000		

Independent Variable: LM2

- ***Level:***

Null Hypothesis: LM2 has a unit root

Exogenous: Constant

Bandwidth: 4 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.113630	0.7116
Test critical values:	1% level	-3.446650	
	5% level	-2.868620	
	10% level	-2.570607	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000183
HAC corrected variance (Bartlett kernel)	0.000225

Phillips-Perron Test Equation

Dependent Variable: D(LM2)

Method: Least Squares

Date: 08/03/13 Time: 22:13

Sample (adjusted): 1980M02 2013M01

Included observations: 396 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LM2(-1)	-0.000696	0.000576	-1.207965	0.2278
C	0.018831	0.007029	2.679217	0.0077

R-squared	0.003690	Mean dependent var	0.010381
Adjusted R-squared	0.001161	S.D. dependent var	0.013581
S.E. of regression	0.013573	Akaike info criterion	-5.756409
Sum squared resid	0.072587	Schwarz criterion	-5.736301
Log likelihood	1141.769	Hannan-Quinn criter.	-5.748443
F-statistic	1.459179	Durbin-Watson stat	1.826836
Prob(F-statistic)	0.227785		

➢ *First Difference:*

Null Hypothesis: D(LM2) has a unit root

Exogenous: Constant

Bandwidth: 1 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-18.38856	0.0000
Test critical values:	1% level	-3.446692	
	5% level	-2.868638	
	10% level	-2.570617	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000181
HAC corrected variance (Bartlett kernel)	0.000179

Phillips-Perron Test Equation

Dependent Variable: D(LM2,2)

Method: Least Squares

Date: 08/03/13 Time: 22:14

Sample (adjusted): 1980M03 2013M01

Included observations: 395 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LM2(-1))	-0.918515	0.049934	-18.39442	0.0000
C	0.009454	0.000853	11.08973	0.0000

R-squared	0.462641	Mean dependent var	-5.87E-05
Adjusted R-squared	0.461274	S.D. dependent var	0.018352
S.E. of regression	0.013470	Akaike info criterion	-5.771665
Sum squared resid	0.071305	Schwarz criterion	-5.751519
Log likelihood	1141.904	Hannan-Quinn criter.	-5.763683
F-statistic	338.3548	Durbin-Watson stat	2.017062
Prob(F-statistic)	0.000000		

Independent Variable: LREER

- ***Level:***

Null Hypothesis: LREER has a unit root

Exogenous: Constant

Bandwidth: 3 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.422298	0.5718
Test critical values:	1% level	-3.446650	
	5% level	-2.868620	
	10% level	-2.570607	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000291
HAC corrected variance (Bartlett kernel)	0.000391

Phillips-Perron Test Equation

Dependent Variable: D(LREER)

Method: Least Squares

Date: 08/03/13 Time: 22:15

Sample (adjusted): 1980M02 2013M01

Included observations: 396 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LREER(-1)	-0.005554	0.004043	-1.373757	0.1703
C	0.025744	0.019596	1.313771	0.1897

R-squared	0.004767	Mean dependent var	-0.001150
Adjusted R-squared	0.002241	S.D. dependent var	0.017111
S.E. of regression	0.017092	Akaike info criterion	-5.295339
Sum squared resid	0.115106	Schwarz criterion	-5.275231
Log likelihood	1050.477	Hannan-Quinn criter.	-5.287373
F-statistic	1.887208	Durbin-Watson stat	1.625884
Prob(F-statistic)	0.170298		

- ***First Difference:***

Null Hypothesis: D(LREER) has a unit root

Exogenous: Constant

Bandwidth: 4 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-16.49399	0.0000
Test critical values:	1% level	-3.446692	
	5% level	-2.868638	
	10% level	-2.570617	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000283
HAC corrected variance (Bartlett kernel)	0.000297

Phillips-Perron Test Equation

Dependent Variable: D(LREER,2)

Method: Least Squares

Date: 08/03/13 Time: 22:18

Sample (adjusted): 1980M03 2013M01

Included observations: 395 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LREER(-1))	-0.814030	0.049601	-16.41142	0.0000
C	-0.000930	0.000850	-1.093336	0.2749

R-squared	0.406644	Mean dependent var	3.32E-05
Adjusted R-squared	0.405134	S.D. dependent var	0.021855
S.E. of regression	0.016856	Akaike info criterion	-5.323151
Sum squared resid	0.111663	Schwarz criterion	-5.303004
Log likelihood	1053.322	Hannan-Quinn criter.	-5.315168
F-statistic	269.3346	Durbin-Watson stat	1.985665
Prob(F-statistic)	0.000000		

Independent Variable: Dummy (Financial Crisis)

- ***Level:***

Null Hypothesis: DUMMY has a unit root

Exogenous: Constant

Bandwidth: 6 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.589706	0.0002
Test critical values:	1% level	-3.446650	
	5% level	-2.868620	
	10% level	-2.570607	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.004833
HAC corrected variance (Bartlett kernel)	0.005837

Phillips-Perron Test Equation

Dependent Variable: D(DUMMY)

Method: Least Squares

Date: 08/03/13 Time: 22:18

Sample (adjusted): 1980M02 2013M01

Included observations: 396 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DUMMY(-1)	-0.085938	0.020432	-4.205924	0.0000
C	0.002604	0.003557	0.732157	0.4645

R-squared	0.042969	Mean dependent var	0.000000
Adjusted R-squared	0.040540	S.D. dependent var	0.071157
S.E. of regression	0.069700	Akaike info criterion	-2.484208
Sum squared resid	1.914062	Schwarz criterion	-2.464100
Log likelihood	493.8732	Hannan-Quinn criter.	-2.476242
F-statistic	17.68980	Durbin-Watson stat	1.917921
Prob(F-statistic)	0.000032		

APPENDIX 4: MULTIVARIATE VECTOR ERROR CORRECTION MODEL (VECM)

Vector Error Correction Estimates
Date: 08/03/13 Time: 23:13
Sample (adjusted): 1981M07 2013M01
Included observations: 379 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LKLCI(-1)	1.000000
INF(-1)	-16.76790
	(3.13437)
	[-5.34968]
LM2(-1)	-22.02673
	(7.95282)
	[-2.76968]
LREER(-1)	-96.42038
	(40.7620)
	[-2.36545]
DUMMY(-1)	74.03155
	(35.1079)
	[2.10869]
C	774.6085

Error Correction:	D(LKLCI)	D(INF)	D(LM2)	D(LREER)	D(DUMMY)
CointEq1	0.000475	0.002996	-1.33E-05	-7.36E-05	-0.000516
	(0.00019)	(0.00120)	(3.3E-05)	(4.4E-05)	(0.00014)
	[2.49593]	[2.48928]	[-0.39835]	[-1.67310]	[-3.61077]
D(LKLCI(-1))	0.084245	-0.098057	0.012612	0.016821	-0.031899
	(0.05995)	(0.37910)	(0.01051)	(0.01385)	(0.04498)
	[1.40537]	[-0.25866]	[1.19994]	[1.21443]	[-0.70917]
D(LKLCI(-2))	0.061244	-0.011534	0.002577	0.058415	0.030078
	(0.05965)	(0.37725)	(0.01046)	(0.01378)	(0.04476)
	[1.02668]	[-0.03057]	[0.24640]	[4.23794]	[0.67196]
D(LKLCI(-3))	-0.199308	0.297102	0.017327	0.001422	-0.004703
	(0.06000)	(0.37947)	(0.01052)	(0.01386)	(0.04502)
	[-3.32165]	[0.78295]	[1.64701]	[0.10254]	[-0.10446]
D(LKLCI(-4))	-0.039643	-0.228180	-0.001719	-0.003116	-0.021059
	(0.06132)	(0.38783)	(0.01075)	(0.01417)	(0.04602)
	[-0.64645]	[-0.58836]	[-0.15991]	[-0.21993]	[-0.45765]
D(LKLCI(-5))	-0.038041	-0.522105	-0.028875	0.022234	-0.014244
	(0.06071)	(0.38394)	(0.01064)	(0.01403)	(0.04556)
	[-0.62660]	[-1.35985]	[-2.71270]	[1.58498]	[-0.31268]
D(LKLCI(-6))	-0.130926	0.485426	0.021812	-0.005150	0.010979
	(0.05971)	(0.37764)	(0.01047)	(0.01380)	(0.04481)
	[-2.19256]	[1.28544]	[2.08339]	[-0.37323]	[0.24504]
D(LKLCI(-7))	0.110363	-0.120704	0.014718	0.000919	-0.006865
	(0.06045)	(0.38232)	(0.01060)	(0.01397)	(0.04536)
	[1.82555]	[-0.31571]	[1.38857]	[0.06581]	[-0.15134]

D(LKLCI(-8))	-0.038375	0.154990	-0.011020	0.004569	-0.014380
	(0.06048)	(0.38248)	(0.01060)	(0.01397)	(0.04538)
	[-0.63452]	[0.40522]	[-1.03924]	[0.32693]	[-0.31686]
D(LKLCI(-9))	-0.012272	-0.262989	-0.008494	0.010942	0.023581
	(0.05923)	(0.37456)	(0.01038)	(0.01369)	(0.04444)
	[-0.20720]	[-0.70212]	[-0.81797]	[0.79952]	[0.53060]
D(LKLCI(-10))	0.069243	-0.128968	0.008151	-0.032335	0.081267
	(0.05909)	(0.37370)	(0.01036)	(0.01365)	(0.04434)
	[1.17180]	[-0.34511]	[0.78670]	[-2.36819]	[1.83281]
D(LKLCI(-11))	-0.023158	0.174485	0.005994	0.008235	-0.014021
	(0.05919)	(0.37435)	(0.01038)	(0.01368)	(0.04442)
	[-0.39122]	[0.46610]	[0.57754]	[0.60205]	[-0.31566]
D(LKLCI(-12))	-0.065408	0.365163	0.001542	0.021452	-0.016127
	(0.05884)	(0.37211)	(0.01032)	(0.01360)	(0.04415)
	[-1.11162]	[0.98133]	[0.14943]	[1.57785]	[-0.36526]
D(LKLCI(-13))	-0.008664	-0.174178	-0.018022	-0.008052	0.025301
	(0.05933)	(0.37522)	(0.01040)	(0.01371)	(0.04452)
	[-0.14603]	[-0.46421]	[-1.73248]	[-0.58731]	[0.56832]
D(LKLCI(-14))	-0.050737	-0.190368	0.006901	0.000804	-0.020887
	(0.05943)	(0.37582)	(0.01042)	(0.01373)	(0.04459)
	[-0.85378]	[-0.50654]	[0.66230]	[0.05854]	[-0.46840]
D(LKLCI(-15))	-0.012293	0.268460	-0.000782	0.003266	-0.014712
	(0.05852)	(0.37007)	(0.01026)	(0.01352)	(0.04391)
	[-0.21008]	[0.72544]	[-0.07619]	[0.24158]	[-0.33506]
D(LKLCI(-16))	-0.061630	-0.358359	0.001036	0.012199	0.069679
	(0.05799)	(0.36674)	(0.01017)	(0.01340)	(0.04351)
	[-1.06276]	[-0.97715]	[0.10191]	[0.91043]	[1.60132]
D(LKLCI(-17))	-0.042644	0.282737	-0.004207	0.000496	0.010651
	(0.05804)	(0.36706)	(0.01018)	(0.01341)	(0.04355)
	[-0.73473]	[0.77028]	[-0.41338]	[0.03700]	[0.24456]
D(INF(-1))	-0.007439	0.208298	0.000428	-0.001290	0.075253
	(0.00933)	(0.05902)	(0.00164)	(0.00216)	(0.00700)
	[-0.79702]	[3.52904]	[0.26145]	[-0.59810]	[10.7455]
D(INF(-2))	-0.002654	0.037833	-7.61E-05	0.001170	0.009184
	(0.01108)	(0.07010)	(0.00194)	(0.00256)	(0.00832)
	[-0.23940]	[0.53971]	[-0.03914]	[0.45699]	[1.10421]
D(INF(-3))	0.009319	-0.004421	0.002870	-0.001010	0.005255
	(0.01093)	(0.06912)	(0.00192)	(0.00253)	(0.00820)
	[0.85265]	[-0.06396]	[1.49799]	[-0.39990]	[0.64083]
D(INF(-4))	-0.017009	0.151655	-0.001315	-0.000477	-0.010005
	(0.01091)	(0.06899)	(0.00191)	(0.00252)	(0.00819)
	[-1.55917]	[2.19820]	[-0.68776]	[-0.18929]	[-1.22229]
D(INF(-5))	-0.002103	0.047748	-0.000467	-0.003693	-0.009598
	(0.01087)	(0.06871)	(0.00190)	(0.00251)	(0.00815)
	[-0.19359]	[0.69490]	[-0.24490]	[-1.47095]	[-1.17724]
D(INF(-6))	-0.003262	-0.022818	-0.000301	0.001588	-0.010815
	(0.00943)	(0.05966)	(0.00165)	(0.00218)	(0.00708)
	[-0.34575]	[-0.38248]	[-0.18206]	[0.72861]	[-1.52784]
D(INF(-7))	-0.005259	0.115355	-0.001328	0.001308	-0.002163
	(0.00937)	(0.05926)	(0.00164)	(0.00217)	(0.00703)

	[-0.56126]	[1.94668]	[-0.80847]	[0.60427]	[-0.30759]
D(INF(-8))	-6.18E-05	0.025064	0.003643	-0.000354	-0.002648
	(0.00940)	(0.05946)	(0.00165)	(0.00217)	(0.00706)
	[-0.00657]	[0.42151]	[2.20968]	[-0.16286]	[-0.37526]
D(INF(-9))	0.002766	-0.072656	0.000414	0.000970	-0.003450
	(0.00943)	(0.05962)	(0.00165)	(0.00218)	(0.00707)
	[0.29339]	[-1.21855]	[0.25034]	[0.44516]	[-0.48765]
D(INF(-10))	-0.001569	0.055513	-0.000472	0.000730	0.001594
	(0.00934)	(0.05908)	(0.00164)	(0.00216)	(0.00701)
	[-0.16797]	[0.93957]	[-0.28840]	[0.33814]	[0.22741]
D(INF(-11))	-0.011068	0.007437	-7.36E-06	0.001172	0.000820
	(0.00932)	(0.05892)	(0.00163)	(0.00215)	(0.00699)
	[-1.18796]	[0.12621]	[-0.00451]	[0.54421]	[0.11737]
D(INF(-12))	0.008423	-0.415547	3.61E-05	-0.000265	0.003002
	(0.00912)	(0.05765)	(0.00160)	(0.00211)	(0.00684)
	[0.92395]	[-7.20768]	[0.02260]	[-0.12599]	[0.43889]
D(INF(-13))	-0.000279	0.184640	0.002341	0.001915	0.035088
	(0.00967)	(0.06119)	(0.00170)	(0.00224)	(0.00726)
	[-0.02885]	[3.01771]	[1.37991]	[0.85666]	[4.83329]
D(INF(-14))	0.004152	0.079222	0.001374	0.000993	-0.006415
	(0.00987)	(0.06243)	(0.00173)	(0.00228)	(0.00741)
	[0.42064]	[1.26904]	[0.79366]	[0.43557]	[-0.86605]
D(INF(-15))	0.027015	-0.031685	8.63E-05	-8.53E-05	-0.003295
	(0.00987)	(0.06239)	(0.00173)	(0.00228)	(0.00740)
	[2.73833]	[-0.50785]	[0.04987]	[-0.03744]	[-0.44515]
D(INF(-16))	-0.019060	0.035647	-0.001477	-0.001338	-0.025726
	(0.00994)	(0.06285)	(0.00174)	(0.00230)	(0.00746)
	[-1.91790]	[0.56717]	[-0.84747]	[-0.58281]	[-3.44983]
D(INF(-17))	0.006586	0.055715	0.003032	-0.002041	-0.008657
	(0.01005)	(0.06354)	(0.00176)	(0.00232)	(0.00754)
	[0.65556]	[0.87686]	[1.72118]	[-0.87910]	[-1.14835]
D(LM2(-1))	0.448175	0.796285	0.042829	-0.150245	-0.352347
	(0.33882)	(2.14273)	(0.05940)	(0.07829)	(0.25424)
	[1.32276]	[0.37162]	[0.72097]	[-1.91909]	[-1.38590]
D(LM2(-2))	0.519286	4.227384	0.100939	0.154741	-0.107955
	(0.34242)	(2.16548)	(0.06004)	(0.07912)	(0.25694)
	[1.51653]	[1.95217]	[1.68132]	[1.95575]	[-0.42016]
D(LM2(-3))	0.113713	0.388044	-0.009066	-0.036115	0.267460
	(0.34758)	(2.19814)	(0.06094)	(0.08031)	(0.26081)
	[0.32715]	[0.17653]	[-0.14876]	[-0.44968]	[1.02549]
D(LM2(-4))	0.550556	-2.342688	-0.039934	-0.101274	-0.052324
	(0.34488)	(2.18108)	(0.06047)	(0.07969)	(0.25879)
	[1.59636]	[-1.07410]	[-0.66042]	[-1.27083]	[-0.20219]
D(LM2(-5))	-0.148658	0.485310	0.016164	-0.045173	0.266345
	(0.33163)	(2.09724)	(0.05814)	(0.07663)	(0.24884)
	[-0.44827]	[0.23140]	[0.27800]	[-0.58951]	[1.07035]
D(LM2(-6))	0.303411	3.237398	0.008272	0.029653	0.332694
	(0.31678)	(2.00338)	(0.05554)	(0.07320)	(0.23770)
	[0.95779]	[1.61597]	[0.14893]	[0.40511]	[1.39962]

D(LM2(-7))	-0.322723	-0.892705	-0.087218	-0.106738	-0.015554
	(0.31576)	(1.99689)	(0.05536)	(0.07296)	(0.23693)
	[-1.02206]	[-0.44705]	[-1.57543]	[-1.46295]	[-0.06565]
D(LM2(-8))	0.448407	0.219803	0.053014	0.003660	-0.300845
	(0.31860)	(2.01488)	(0.05586)	(0.07362)	(0.23907)
	[1.40742]	[0.10909]	[0.94905]	[0.04971]	[-1.25841]
D(LM2(-9))	-0.406873	4.789201	-0.067651	0.051400	-0.095380
	(0.31883)	(2.01632)	(0.05590)	(0.07367)	(0.23924)
	[-1.27615]	[2.37522]	[-1.21021]	[0.69770]	[-0.39868]
D(LM2(-10))	-0.183941	-1.229985	-0.007801	-0.027919	-0.539100
	(0.32294)	(2.04230)	(0.05662)	(0.07462)	(0.24232)
	[-0.56959]	[-0.60226]	[-0.13778]	[-0.37415]	[-2.22474]
D(LM2(-11))	0.289182	-0.658028	0.101435	-0.047270	-0.143130
	(0.31964)	(2.02146)	(0.05604)	(0.07386)	(0.23985)
	[0.90470]	[-0.32552]	[1.80996]	[-0.64001]	[-0.59675]
D(LM2(-12))	-0.148177	0.871061	0.299837	-0.048402	-0.062778
	(0.32075)	(2.02847)	(0.05624)	(0.07411)	(0.24068)
	[-0.46197]	[0.42942]	[5.33166]	[-0.65307]	[-0.26083]
D(LM2(-13))	-0.094479	-1.360451	0.051819	0.021507	-0.318966
	(0.33440)	(2.11476)	(0.05863)	(0.07727)	(0.25092)
	[-0.28254]	[-0.64331]	[0.88385]	[0.27835]	[-1.27120]
D(LM2(-14))	-0.348568	-2.615742	-0.073090	0.043884	0.174073
	(0.33287)	(2.10512)	(0.05836)	(0.07692)	(0.24977)
	[-1.04715]	[-1.24256]	[-1.25235]	[0.57055]	[0.69692]
D(LM2(-15))	-0.169993	2.715974	-0.066249	0.047915	-0.215896
	(0.33236)	(2.10191)	(0.05827)	(0.07680)	(0.24939)
	[-0.51147]	[1.29215]	[-1.13688]	[0.62391]	[-0.86569]
D(LM2(-16))	0.547365	3.180279	0.085218	0.132504	-0.457603
	(0.33368)	(2.11022)	(0.05850)	(0.07710)	(0.25038)
	[1.64040]	[1.50708]	[1.45663]	[1.71856]	[-1.82764]
D(LM2(-17))	0.229210	2.327595	-0.013762	-0.034187	-0.080839
	(0.33157)	(2.09689)	(0.05813)	(0.07661)	(0.24880)
	[0.69129]	[1.11002]	[-0.23673]	[-0.44621]	[-0.32492]
D(LREER(-1))	0.578052	-1.528255	0.002185	0.177123	-0.232003
	(0.26987)	(1.70669)	(0.04732)	(0.06236)	(0.20250)
	[2.14197]	[-0.89545]	[0.04618]	[2.84043]	[-1.14569]
D(LREER(-2))	-0.174144	1.403856	-0.089228	-0.095156	0.014221
	(0.27309)	(1.72708)	(0.04788)	(0.06310)	(0.20492)
	[-0.63767]	[0.81285]	[-1.86352]	[-1.50795]	[0.06940]
D(LREER(-3))	0.610602	-2.675630	0.004188	0.063327	-0.089745
	(0.27194)	(1.71979)	(0.04768)	(0.06284)	(0.20406)
	[2.24534]	[-1.55579]	[0.08784]	[1.00781]	[-0.43981]
D(LREER(-4))	-0.235722	1.056476	0.054144	-0.030192	-0.105861
	(0.27222)	(1.72154)	(0.04773)	(0.06290)	(0.20426)
	[-0.86593]	[0.61368]	[1.13444]	[-0.48000]	[-0.51826]
D(LREER(-5))	0.004996	-1.796780	0.073465	-0.067896	0.006368
	(0.27268)	(1.72446)	(0.04781)	(0.06301)	(0.20461)
	[0.01832]	[-1.04194]	[1.53664]	[-1.07760]	[0.03112]
D(LREER(-6))	-0.398338	-1.493487	-0.018028	0.017112	0.312843
	(0.27055)	(1.71101)	(0.04744)	(0.06252)	(0.20301)

	[-1.47231]	[-0.87287]	[-0.38005]	[0.27373]	[1.54100]
D(LREER(-7))	0.733583	-0.669726	0.019465	0.035414	0.304852
	(0.27298)	(1.72637)	(0.04786)	(0.06308)	(0.20484)
	[2.68729]	[-0.38794]	[0.40670]	[0.56144]	[1.48828]
D(LREER(-8))	0.070157	0.236709	0.056106	-0.082694	0.072458
	(0.27514)	(1.74000)	(0.04824)	(0.06357)	(0.20645)
	[0.25499]	[0.13604]	[1.16307]	[-1.30074]	[0.35097]
D(LREER(-9))	0.404303	2.276866	0.056908	0.102689	-0.143698
	(0.27355)	(1.72994)	(0.04796)	(0.06321)	(0.20526)
	[1.47801]	[1.31616]	[1.18656]	[1.62464]	[-0.70008]
D(LREER(-10))	-0.345384	-0.655210	-0.078744	-0.031967	-0.066829
	(0.27410)	(1.73344)	(0.04806)	(0.06334)	(0.20567)
	[-1.26007]	[-0.37798]	[-1.63853]	[-0.50473]	[-0.32492]
D(LREER(-11))	-0.160452	-0.196765	-0.005833	-0.051227	-0.203190
	(0.27219)	(1.72137)	(0.04772)	(0.06289)	(0.20424)
	[-0.58948]	[-0.11431]	[-0.12222]	[-0.81449]	[-0.99485]
D(LREER(-12))	-0.433213	-3.129030	0.078134	-0.023857	-0.201313
	(0.27222)	(1.72153)	(0.04773)	(0.06290)	(0.20426)
	[-1.59143]	[-1.81759]	[1.63708]	[-0.37928]	[-0.98557]
D(LREER(-13))	0.142273	1.253039	0.004513	0.093142	0.163126
	(0.27351)	(1.72973)	(0.04795)	(0.06320)	(0.20523)
	[0.52017]	[0.72441]	[0.09410]	[1.47377]	[0.79483]
D(LREER(-14))	0.167751	-0.099241	0.005021	0.051819	0.073384
	(0.27440)	(1.73536)	(0.04811)	(0.06341)	(0.20590)
	[0.61133]	[-0.05719]	[0.10437]	[0.81726]	[0.35640]
D(LREER(-15))	-0.284365	2.328499	0.017438	0.029284	0.317425
	(0.26935)	(1.70340)	(0.04722)	(0.06224)	(0.20211)
	[-1.05575]	[1.36697]	[0.36924]	[0.47053]	[1.57056]
D(LREER(-16))	-0.372446	0.507483	-0.022143	-0.112532	-0.326435
	(0.26673)	(1.68680)	(0.04676)	(0.06163)	(0.20014)
	[-1.39637]	[0.30085]	[-0.47351]	[-1.82590]	[-1.63103]
D(LREER(-17))	-0.140077	2.334551	-0.012668	0.055922	-0.194950
	(0.26497)	(1.67568)	(0.04646)	(0.06122)	(0.19882)
	[-0.52866]	[1.39320]	[-0.27268]	[0.91339]	[-0.98053]
D(DUMMY(-1))	-0.002966	-0.184595	-0.010755	0.008081	-0.129427
	(0.07609)	(0.48117)	(0.01334)	(0.01758)	(0.05709)
	[-0.03898]	[-0.38363]	[-0.80619]	[0.45963]	[-2.26700]
D(DUMMY(-2))	-0.097605	-0.494719	-0.005178	-0.013841	-0.029188
	(0.07457)	(0.47157)	(0.01307)	(0.01723)	(0.05595)
	[-1.30897]	[-1.04909]	[-0.39607]	[-0.80329]	[-0.52167]
D(DUMMY(-3))	-0.023912	-1.151780	-0.006232	0.017284	0.041040
	(0.07451)	(0.47120)	(0.01306)	(0.01722)	(0.05591)
	[-0.32093]	[-2.44433]	[-0.47703]	[1.00394]	[0.73405]
D(DUMMY(-4))	0.047776	-1.507868	0.003408	0.008827	0.104594
	(0.07527)	(0.47600)	(0.01320)	(0.01739)	(0.05648)
	[0.63475]	[-3.16777]	[0.25823]	[0.50751]	[1.85193]
D(DUMMY(-5))	0.034464	-0.965396	0.007801	0.005016	0.184120
	(0.07432)	(0.47001)	(0.01303)	(0.01717)	(0.05577)
	[0.46372]	[-2.05397]	[0.59863]	[0.29211]	[3.30155]

D(DUMMY(-6))	-0.027040	-0.681600	0.005522	-0.017189	0.125728
	(0.06772)	(0.42828)	(0.01187)	(0.01565)	(0.05082)
	[-0.39928]	[-1.59147]	[0.46506]	[-1.09846]	[2.47418]
D(DUMMY(-7))	-0.017623	-0.013844	-0.015331	-0.002031	0.079929
	(0.06822)	(0.43144)	(0.01196)	(0.01576)	(0.05119)
	[-0.25832]	[-0.03209]	[-1.28170]	[-0.12886]	[1.56138]
D(DUMMY(-8))	-0.093044	0.078269	-0.010519	-0.020482	0.039595
	(0.06831)	(0.43201)	(0.01198)	(0.01578)	(0.05126)
	[-1.36205]	[0.18117]	[-0.87827]	[-1.29763]	[0.77246]
D(DUMMY(-9))	0.053423	-0.210911	-4.14E-05	-0.020828	0.020270
	(0.06801)	(0.43013)	(0.01192)	(0.01572)	(0.05104)
	[0.78548]	[-0.49034]	[-0.00347]	[-1.32528]	[0.39717]
D(DUMMY(-10))	0.045864	-0.129940	-0.011045	-0.002551	0.021190
	(0.06833)	(0.43215)	(0.01198)	(0.01579)	(0.05128)
	[0.67117]	[-0.30068]	[-0.92186]	[-0.16156]	[0.41325]
D(DUMMY(-11))	-0.049599	-0.318658	-0.000844	-0.008020	-0.001909
	(0.06786)	(0.42913)	(0.01190)	(0.01568)	(0.05092)
	[-0.73094]	[-0.74257]	[-0.07093]	[-0.51149]	[-0.03749]
D(DUMMY(-12))	-0.029730	-0.714453	-0.000454	-0.010844	-0.459614
	(0.06662)	(0.42130)	(0.01168)	(0.01539)	(0.04999)
	[-0.44628]	[-1.69582]	[-0.03885]	[-0.70448]	[-9.19450]
D(DUMMY(-13))	-0.098675	-0.569199	-0.004926	-0.003600	0.029727
	(0.07454)	(0.47139)	(0.01307)	(0.01722)	(0.05593)
	[-1.32380]	[-1.20748]	[-0.37696]	[-0.20901]	[0.53148]
D(DUMMY(-14))	-0.182038	-0.261052	0.004756	-0.011079	0.049861
	(0.07465)	(0.47211)	(0.01309)	(0.01725)	(0.05602)
	[-2.43847]	[-0.55294]	[0.36338]	[-0.64230]	[0.89010]
D(DUMMY(-15))	-0.006877	-0.572927	0.003087	0.047233	0.132133
	(0.07498)	(0.47418)	(0.01315)	(0.01733)	(0.05626)
	[-0.09172]	[-1.20825]	[0.23482]	[2.72624]	[2.34854]
D(DUMMY(-16))	-0.011436	-0.723921	-0.007271	0.011691	0.120609
	(0.07649)	(0.48376)	(0.01341)	(0.01768)	(0.05740)
	[-0.14950]	[-1.49645]	[-0.54217]	[0.66144]	[2.10126]
D(DUMMY(-17))	-0.002768	-0.462984	0.012343	0.012199	0.082533
	(0.06567)	(0.41533)	(0.01151)	(0.01518)	(0.04928)
	[-0.04215]	[-1.11473]	[1.07198]	[0.80390]	[1.67479]
C	-0.012103	-0.158894	0.006245	-0.000325	0.018236
	(0.01241)	(0.07851)	(0.00218)	(0.00287)	(0.00931)
	[-0.97499]	[-2.02393]	[2.86947]	[-0.11342]	[1.95766]
R-squared	0.318624	0.470948	0.289043	0.287958	0.571886
Adj. R-squared	0.117944	0.315132	0.079652	0.078246	0.445798
Sum sq. resids	1.520710	60.82006	0.046747	0.081193	0.856227
S.E. equation	0.072166	0.456386	0.012653	0.016675	0.054151
F-statistic	1.587725	3.022453	1.380397	1.373115	4.535604
Log likelihood	507.9513	-191.0654	1167.825	1063.206	616.7995
Akaike AIC	-2.221379	1.467363	-5.703559	-5.151482	-2.795776
Schwarz SC	-1.317512	2.371231	-4.799692	-4.247615	-1.891909
Mean dependent	0.002909	-0.024037	0.010044	-0.001158	0.000000
S.D. dependent	0.076839	0.551478	0.013189	0.017368	0.072739

Determinant resid covariance (dof adj.)	1.24E-13
Determinant resid covariance	3.38E-14
Log likelihood	3189.359
Akaike information criterion	-14.50849

Schwarz criterion	-9.937210

Residual 1:

Date: 08/03/13 Time: 23:13
Sample: 1980M01 2013M01
Included observations: 379

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|. |	.|. |	1	0.014	0.014	0.0773	0.781
.|. |	.|. |	2	0.014	0.013	0.1481	0.929
.|. |	.|. |	3	0.032	0.032	0.5501	0.908
.|. |	.|. |	4	-0.001	-0.003	0.5509	0.968
.|. |	.|. |	5	-0.011	-0.012	0.5997	0.988
.|. |	.|. |	6	0.012	0.012	0.6579	0.995
.|. |	.|. |	7	0.005	0.005	0.6685	0.999
.|. |	.|. |	8	-0.023	-0.023	0.8809	0.999
.|. |	.|. |	9	0.017	0.017	0.9968	0.999
.|. |	.|. |	10	0.010	0.009	1.0337	1.000
.|. |	.|. |	11	-0.004	-0.003	1.0402	1.000
.|. |	.|. |	12	-0.003	-0.005	1.0448	1.000
.|. |	.|. |	13	-0.042	-0.043	1.7315	1.000
.|. |	.|. |	14	-0.019	-0.016	1.8679	1.000
.|. |	.|. |	15	-0.006	-0.004	1.8818	1.000
.|. |	.|. |	16	-0.000	0.002	1.8818	1.000
.|. |	.|. |	17	0.019	0.021	2.0309	1.000
.|. |	.|. |	18	-0.017	-0.018	2.1451	1.000
*|. |	*|. |	19	-0.082	-0.082	4.8409	1.000
*|. |	*|. |	20	-0.086	-0.085	7.8004	0.993
.|. |	.|. |	21	-0.031	-0.028	8.1929	0.994
.|. |	.|. |	22	-0.012	-0.003	8.2491	0.996
.|. |	.|. |	23	0.050	0.058	9.2520	0.995
.|. |	.|. |	24	0.027	0.027	9.5404	0.996
.|. |	.|. |	25	-0.050	-0.052	10.540	0.995
.|. |	.|. |	26	0.000	-0.006	10.540	0.997
.|. |	.|. |	27	0.016	0.011	10.651	0.998
.|. |	.|. |	28	-0.045	-0.043	11.492	0.998
.|. |	.|. |	29	-0.022	-0.018	11.686	0.998
.|. |	.|. |	30	-0.020	-0.018	11.853	0.999
.|. |	.|. |	31	0.022	0.029	12.057	0.999
.|. |	.|. |	32	0.008	0.002	12.083	0.999
.|. |	.|. |	33	-0.025	-0.042	12.338	1.000
.|. |	.|. |	34	0.047	0.041	13.269	0.999
.|. |	.|. |	35	0.012	0.013	13.325	1.000
.|. |	.|. |	36	-0.041	-0.036	14.045	1.000

Residual 2:

Date: 08/03/13 Time: 23:14
Sample: 1980M01 2013M01
Included observations: 379

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|. |	.|. |	1	-0.011	-0.011	0.0453	0.831
.|. |	.|. |	2	-0.019	-0.019	0.1767	0.915
.|. |	.|. |	3	-0.021	-0.021	0.3434	0.952
.|. |	.|. |	4	-0.018	-0.019	0.4686	0.976
.|. |	.|. |	5	-0.036	-0.037	0.9729	0.965
.|. |	.|. |	6	0.016	0.014	1.0752	0.983
.|. |	.|. |	7	0.028	0.026	1.3796	0.986
.|. |	.|. |	8	0.007	0.006	1.3977	0.994
.|. |	.|. |	9	-0.004	-0.003	1.4026	0.998
.|. |	.|. |	10	-0.014	-0.013	1.4759	0.999
.|. |	.|. |	11	0.002	0.004	1.4777	1.000
*|. |	*|. |	12	-0.168	-0.167	12.617	0.397
.|. |	.|. |	13	-0.007	-0.012	12.635	0.476
.|. |	.|. |	14	0.002	-0.006	12.637	0.555
.|. |	.|. |	15	-0.026	-0.036	12.907	0.610
.|. |	.|. |	16	-0.005	-0.011	12.915	0.679
.|. |	.|. |	17	-0.002	-0.015	12.916	0.742
.|. |	.|. |	18	0.031	0.035	13.309	0.773
.|. |	.|. |	19	0.012	0.020	13.366	0.819
.|. |	.|. |	20	0.001	0.002	13.367	0.861
.|. |	.|. |	21	-0.058	-0.059	14.733	0.836
.|. |	.|. |	22	-0.007	-0.011	14.751	0.873
.|. |	.|. |	23	-0.011	-0.010	14.803	0.902
**|. |	**|. |	24	-0.253	-0.296	40.751	0.018
.|. |	.|. |	25	-0.024	-0.048	40.984	0.023
.|. |	.|. |	26	-0.001	-0.026	40.984	0.031
.|* |	.|* |	27	0.097	0.077	44.842	0.017
.|. |	.|. |	28	-0.029	-0.042	45.180	0.021
.|. |	*|. |	29	-0.043	-0.070	45.945	0.024
.|. |	.|. |	30	0.008	0.034	45.970	0.031
.|. |	.|. |	31	0.024	0.048	46.209	0.039
.|. |	.|. |	32	0.001	0.010	46.210	0.050
.|. |	.|. |	33	0.052	0.016	47.342	0.051
.|. |	.|. |	34	0.014	-0.002	47.425	0.063
.|. |	.|. |	35	-0.015	-0.013	47.521	0.077
.|. |	*|. |	36	0.001	-0.118	47.522	0.095

Residual 3:

Date: 08/03/13 Time: 23:14
Sample: 1980M01 2013M01
Included observations: 379

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|. |	.|. |	1	0.000	0.000	1.E-05	0.997
.|. |	.|. |	2	-0.003	-0.003	0.0025	0.999
.|. |	.|. |	3	0.012	0.012	0.0549	0.997
.|. |	.|. |	4	-0.005	-0.005	0.0661	0.999
.|. |	.|. |	5	0.006	0.006	0.0789	1.000
.|. |	.|. |	6	0.007	0.006	0.0953	1.000
.|. |	.|. |	7	-0.009	-0.008	0.1241	1.000
.|. |	.|. |	8	-0.015	-0.015	0.2127	1.000
.|. |	.|. |	9	0.010	0.010	0.2548	1.000
.|. |	.|. |	10	-0.026	-0.026	0.5126	1.000
.|. |	.|. |	11	-0.011	-0.011	0.5601	1.000
.|. |	.|. |	12	-0.061	-0.062	2.0318	0.999
.|. |	.|. |	13	-0.033	-0.032	2.4529	0.999
.|. |	.|. |	14	-0.034	-0.035	2.9146	0.999
.|. |	.|. |	15	0.002	0.003	2.9166	1.000
.|. |	.|. |	16	0.047	0.048	3.8010	0.999
.|. |	.|. |	17	0.017	0.019	3.9202	1.000
.|. |	.|. |	18	0.030	0.030	4.2743	1.000
.|. |	.|. |	19	0.012	0.011	4.3279	1.000
.|. |	.|. |	20	-0.003	-0.005	4.3321	1.000
.|* |	.|* |	21	0.089	0.088	7.5487	0.997
.|. |	.|. |	22	-0.018	-0.022	7.6736	0.998
.|. |	.|. |	23	0.035	0.035	8.1808	0.998
.|* |	.|* |	24	0.094	0.089	11.802	0.982
.|. |	.|. |	25	0.066	0.065	13.580	0.969
.|. |	.|. |	26	0.029	0.028	13.913	0.974
*|. |	*|. |	27	-0.084	-0.087	16.774	0.937
.|. |	.|. |	28	0.030	0.038	17.140	0.946
*|. |	*|. |	29	-0.130	-0.128	24.072	0.725
.|. |	.|. |	30	0.010	0.016	24.115	0.767
.|. |	.|. |	31	-0.013	-0.008	24.182	0.803
.|. |	.|. |	32	-0.035	-0.031	24.699	0.818
*|. |	*|. |	33	-0.134	-0.131	32.153	0.509
.|. |	.|. |	34	-0.057	-0.062	33.508	0.492
.|. |	.|. |	35	0.027	0.037	33.825	0.525
.|. |	.|. |	36	0.053	0.071	35.007	0.516

Residual 4:

Date: 08/03/13 Time: 23:14
Sample: 1980M01 2013M01
Included observations: 379

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|. |	.|. |	1	0.002	0.002	0.0016	0.968
.|. |	.|. |	2	0.007	0.007	0.0218	0.989
.|. |	.|. |	3	0.002	0.002	0.0231	0.999
.|. |	.|. |	4	-0.004	-0.004	0.0289	1.000
.|. |	.|. |	5	-0.017	-0.017	0.1469	1.000
.|. |	.|. |	6	0.004	0.004	0.1539	1.000
.|. |	.|. |	7	0.017	0.017	0.2638	1.000
.|. |	.|. |	8	-0.032	-0.032	0.6557	1.000
.|. |	.|. |	9	-0.010	-0.011	0.6965	1.000
.|. |	.|. |	10	0.021	0.021	0.8658	1.000
.|. |	.|. |	11	-0.010	-0.010	0.9067	1.000
.|. |	.|. |	12	0.000	0.000	0.9067	1.000
.|. |	.|. |	13	-0.017	-0.019	1.0274	1.000
.|. |	.|. |	14	0.022	0.022	1.2126	1.000
.|. |	.|. |	15	0.003	0.005	1.2164	1.000
.|. |	.|. |	16	-0.001	-0.003	1.2171	1.000
.|. |	.|. |	17	0.005	0.004	1.2274	1.000
.|. |	.|. |	18	-0.008	-0.007	1.2541	1.000
.|. |	.|. |	19	-0.018	-0.017	1.3852	1.000
.|. |	.|. |	20	0.043	0.043	2.1200	1.000
.|. |	.|. |	21	-0.022	-0.024	2.3202	1.000
.|. |	.|. |	22	0.024	0.024	2.5512	1.000
.|. |	.|. |	23	-0.058	-0.057	3.9027	1.000
.|. |	*|. |	24	-0.064	-0.066	5.5755	1.000
.|. |	.|. |	25	-0.030	-0.027	5.9367	1.000
.|. |	.|. |	26	-0.008	-0.008	5.9625	1.000
.|. |	.|. |	27	0.015	0.014	6.0511	1.000
*|. |	*|. |	28	-0.075	-0.075	8.3345	1.000
.|. |	.|. |	29	-0.061	-0.065	9.8484	1.000
.|. |	.|. |	30	0.053	0.056	10.995	0.999
.|. |	.|. |	31	-0.013	-0.012	11.061	1.000
.|. |	.|. |	32	0.069	0.064	13.041	0.999
.|* |	.|* |	33	0.110	0.112	18.095	0.984
.|. |	.|. |	34	0.002	-0.003	18.097	0.988
*|. |	*|. |	35	-0.098	-0.096	22.122	0.955
.|. |	.|. |	36	-0.052	-0.062	23.242	0.950

Residual 5:

Date: 08/03/13 Time: 23:14
Sample: 1980M01 2013M01
Included observations: 379

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|. |	.|. |	1	-0.014	-0.014	0.0740	0.786
.|. |	.|. |	2	-0.032	-0.033	0.4771	0.788
.|. |	.|. |	3	-0.012	-0.012	0.5283	0.913
.|. |	.|. |	4	-0.006	-0.007	0.5411	0.969
.|. |	.|. |	5	-0.026	-0.027	0.8055	0.977
.|. |	.|. |	6	0.016	0.015	0.9103	0.989
.|. |	.|. |	7	-0.013	-0.015	0.9806	0.995
.|. |	.|. |	8	0.006	0.006	0.9958	0.998
.|. |	.|. |	9	0.015	0.014	1.0801	0.999
.|. |	.|. |	10	0.011	0.011	1.1310	1.000
.|. |	.|. |	11	-0.008	-0.006	1.1560	1.000
*|. |	*|. |	12	-0.134	-0.135	8.2615	0.764
.|. |	.|. |	13	0.029	0.027	8.5997	0.802
.|. |	.|. |	14	0.016	0.009	8.7032	0.850
.|. |	.|. |	15	-0.013	-0.014	8.7725	0.889
.|. |	.|. |	16	0.012	0.012	8.8323	0.920
.|. |	.|. |	17	0.006	-0.001	8.8469	0.945
.|. |	.|. |	18	-0.001	0.006	8.8471	0.963
.|. |	.|. |	19	-0.012	-0.017	8.9075	0.975
.|. |	.|. |	20	0.010	0.011	8.9457	0.984
.|. |	.|. |	21	0.035	0.040	9.4303	0.985
.|. |	.|. |	22	0.054	0.058	10.623	0.980
.|. |	.|. |	23	0.013	0.015	10.689	0.986
**|. |	**|. |	24	-0.243	-0.264	34.715	0.073
.|. |	.|* |	25	0.063	0.075	36.328	0.067
.|. |	.|. |	26	-0.013	-0.023	36.402	0.085
.|. |	.|. |	27	-0.034	-0.041	36.880	0.097
.|. |	.|. |	28	-0.015	-0.014	36.979	0.119
.|. |	.|. |	29	0.020	0.005	37.138	0.143
.|. |	.|. |	30	-0.016	-0.005	37.243	0.170
.|. |	.|. |	31	0.030	0.010	37.604	0.192
.|. |	.|. |	32	-0.001	0.006	37.605	0.228
.|. |	.|. |	33	0.030	0.052	37.969	0.253
.|. |	.|. |	34	-0.060	-0.046	39.461	0.239
.|. |	.|. |	35	0.028	0.030	39.790	0.265
.|. |	*|. |	36	0.000	-0.085	39.790	0.305

APPENDIX 5: JOHANSEN CO-INTEGRATION TEST

Date: 08/03/13 Time: 23:23
Sample (adjusted): 1981M07 2013M01
Included observations: 379 after adjustments
Trend assumption: Linear deterministic trend
Series: LKLCI INF LM2 LREER DUMMY
Lags interval (in first differences): 1 to 17

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.108170	86.99883	69.81889	0.0012
At most 1	0.048297	43.61104	47.85613	0.1184
At most 2	0.038441	24.84971	29.79707	0.1669
At most 3	0.024139	9.993277	15.49471	0.2812
At most 4	0.001931	0.732550	3.841466	0.3921

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.108170	43.38779	33.87687	0.0028
At most 1	0.048297	18.76133	27.58434	0.4331
At most 2	0.038441	14.85643	21.13162	0.2991
At most 3	0.024139	9.260727	14.26460	0.2651
At most 4	0.001931	0.732550	3.841466	0.3921

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

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

LKLCI	INF	LM2	LREER	DUMMY
0.051336	-0.860800	-1.130769	-4.949858	3.800500
2.562644	-0.269258	-0.712848	1.356519	-8.619652
-5.692538	0.129408	2.594722	-0.602742	-4.910898
2.133695	0.293899	-1.984081	-9.980190	-0.851770
-0.715943	-0.116223	-1.530666	-5.598444	1.306905

Unrestricted Adjustment Coefficients (alpha):

D(LKLCI)	0.009252	-0.003941	0.007182	0.003116	0.001548
D(INF)	0.058356	0.058300	0.014374	0.026948	-0.007162
D(LM2)	-0.000259	0.001208	-0.000901	0.000505	0.000343
D(LREER)	-0.001433	-0.001126	0.000571	0.001912	-0.000147
D(DUMMY)	-0.010043	0.004755	0.005893	-0.000974	0.000180

1 Cointegrating Equation(s): Log likelihood 3189.359

Normalized cointegrating coefficients (standard error in parentheses)

LKLCI	INF	LM2	LREER	DUMMY
1.000000	-16.76790	-22.02673	-96.42038	74.03155
	(3.13437)	(7.95282)	(40.7620)	(35.1079)

Adjustment coefficients (standard error in parentheses)

D(LKLCI)	0.000475
	(0.00019)
D(INF)	0.002996
	(0.00120)
D(LM2)	-1.33E-05
	(3.3E-05)
D(LREER)	-7.36E-05
	(4.4E-05)
D(DUMMY)	-0.000516
	(0.00014)

2 Cointegrating Equation(s): Log likelihood 3198.740

Normalized cointegrating coefficients (standard error in parentheses)

LKLCI	INF	LM2	LREER	DUMMY
1.000000	0.000000	-0.141030	1.140677	-3.851607
		(0.23922)	(1.28775)	(1.09640)
0.000000	1.000000	1.305214	5.818324	-4.644778
		(0.45173)	(2.43169)	(2.07037)

Adjustment coefficients (standard error in parentheses)

D(LKLCI)	-0.009624	-0.006903
	(0.00948)	(0.00334)
D(INF)	0.152397	-0.065931
	(0.05945)	(0.02092)
D(LM2)	0.003083	-0.000103
	(0.00166)	(0.00058)
D(LREER)	-0.002959	0.001537
	(0.00219)	(0.00077)
D(DUMMY)	0.011669	0.007365
	(0.00709)	(0.00250)

3 Cointegrating Equation(s): Log likelihood 3206.168

Normalized cointegrating coefficients (standard error in parentheses)

LKLCI	INF	LM2	LREER	DUMMY
1.000000	0.000000	0.000000	1.587112	-6.131301
			(0.85439)	(1.55928)
0.000000	1.000000	0.000000	1.686619	16.45356
			(2.88853)	(5.27162)
0.000000	0.000000	1.000000	3.165538	-16.16465
			(2.19788)	(4.01118)

Adjustment coefficients (standard error in parentheses)

D(LKLCI)	-0.050510	-0.005974	0.010984
	(0.02295)	(0.00335)	(0.01073)
D(INF)	0.070571	-0.064070	-0.070249
	(0.14470)	(0.02112)	(0.06765)
D(LM2)	0.008211	-0.000219	-0.002906
	(0.00402)	(0.00059)	(0.00188)
D(LREER)	-0.006210	0.001611	0.003905
	(0.00533)	(0.00078)	(0.00249)

D(DUMMY)	-0.021877	0.008128	0.023258	
	(0.01714)	(0.00250)	(0.00802)	

4 Cointegrating Equation(s):	Log likelihood	3210.799	

Normalized cointegrating coefficients (standard error in parentheses)

LKLCI	INF	LM2	LREER	DUMMY
1.000000	0.000000	0.000000	0.000000	-11.29713
				(2.76772)
0.000000	1.000000	0.000000	0.000000	10.96384
				(3.83314)
0.000000	0.000000	1.000000	0.000000	-26.46805
				(6.47607)
0.000000	0.000000	0.000000	1.000000	3.254864
				(0.92101)

Adjustment coefficients (standard error in parentheses)

D(LKLCI)	-0.043863	-0.005058	0.004802	-0.086566
	(0.02422)	(0.00351)	(0.01296)	(0.04126)
D(INF)	0.128071	-0.056150	-0.123717	-0.487383
	(0.15256)	(0.02214)	(0.08161)	(0.25989)
D(LM2)	0.009288	-7.08E-05	-0.003907	-0.001572
	(0.00424)	(0.00062)	(0.00227)	(0.00723)
D(LREER)	-0.002131	0.002173	0.000112	-0.013858
	(0.00558)	(0.00081)	(0.00299)	(0.00951)
D(DUMMY)	-0.023955	0.007841	0.025191	0.062334
	(0.01811)	(0.00263)	(0.00969)	(0.03085)

APPENDIX 6: GRANGER CAUSALITY TEST

VEC Granger Causality/Block Exogeneity Wald Tests
Date: 08/03/13 Time: 23:26
Sample: 1980M01 2013M01
Included observations: 379

Dependent variable: D(LKLCI)

Excluded	Chi-sq	df	Prob.
D(INF)	14.70129	17	0.6170
D(LM2)	21.34629	17	0.2112
D(LREER)	28.87467	17	0.0357
D(DUMMY)	13.84943	17	0.6777
All	83.76848	68	0.0941

Dependent variable: D(INF)

Excluded	Chi-sq	df	Prob.
D(LKLCI)	8.727851	17	0.9484
D(LM2)	16.93130	17	0.4590
D(LREER)	14.08250	17	0.6613
D(DUMMY)	25.28178	17	0.0886
All	76.52496	68	0.2239

Dependent variable: D(LM2)

Excluded	Chi-sq	df	Prob.
D(LKLCI)	23.50424	17	0.1335
D(INF)	17.72589	17	0.4063
D(LREER)	18.71212	17	0.3453
D(DUMMY)	7.566028	17	0.9750
All	64.65278	68	0.5927

Dependent variable: D(LREER)

Excluded	Chi-sq	df	Prob.

D(LKLCI)	33.04474	17	0.0111
D(INF)	7.357743	17	0.9784
D(LM2)	18.34243	17	0.3676
D(DUMMY)	14.40275	17	0.6384
All	75.40738	68	0.2514

Dependent variable: D(DUMMY)

Excluded	Chi-sq	df	Prob.
D(LKLCI)	8.848274	17	0.9449
D(INF)	144.5523	17	0.0000
D(LM2)	20.79681	17	0.2355
D(LREER)	15.56233	17	0.5550
All	193.8230	68	0.0000

APPENDIX 7: VARIANCE DECOMPOSITION

Variance Decomposition of LKLCI: Period	S.E.	LKLCI	INF	LM2	LREER	DUMMY
1	0.072166	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.108828	99.01257	0.235458	0.132351	0.594105	0.025519
3	0.140312	98.04217	0.701696	0.574213	0.646051	0.035869
4	0.162593	96.53739	1.048057	0.966805	1.408388	0.039358
5	0.181654	94.27660	2.273841	1.771909	1.613402	0.064252
6	0.197943	92.57987	3.344673	2.162441	1.703599	0.209418
7	0.210424	90.54967	4.710127	2.770023	1.537150	0.433027
8	0.224315	89.40857	5.492476	2.670903	1.772154	0.655899
9	0.237804	87.96309	6.390971	2.591876	2.253482	0.800585
10	0.253487	86.58734	6.875708	2.319980	3.192576	1.024398

Variance Decomposition of INF: Period	S.E.	LKLCI	INF	LM2	LREER	DUMMY
1	0.456386	0.002117	99.99788	0.000000	0.000000	0.000000
2	0.696419	0.025352	99.76066	0.044383	0.168779	0.000831
3	0.882394	0.025083	99.12824	0.656330	0.165955	0.024395
4	1.018365	0.018983	97.81358	1.244665	0.502226	0.420549
5	1.140659	0.018847	96.01685	1.440031	0.755370	1.768898
6	1.237496	0.224628	93.43469	1.653092	1.248498	3.439088
7	1.312514	0.333636	90.11061	2.349241	1.991377	5.215138
8	1.375395	0.532161	87.54110	2.840233	2.764139	6.322368
9	1.433921	0.641799	85.56250	3.163739	3.581898	7.050060
10	1.483149	0.761664	83.78097	3.802853	3.896540	7.757977

Variance Decomposition of LM2: Period	S.E.	LKLCI	INF	LM2	LREER	DUMMY
1	0.012653	0.575745	0.416380	99.00787	0.000000	0.000000
2	0.018365	1.381033	0.563932	97.93511	0.000816	0.119104
3	0.023703	1.582907	0.399733	97.55611	0.256902	0.204348
4	0.028420	2.534955	0.588110	96.10752	0.411925	0.357492
5	0.032127	2.979484	0.520598	95.77050	0.337651	0.391769
6	0.035372	2.643534	0.481321	96.14700	0.344458	0.383684
7	0.038352	2.831520	0.463434	95.99802	0.332203	0.374827
8	0.040890	3.422403	0.418018	95.27696	0.392195	0.490425
9	0.043454	3.923109	0.453861	94.39274	0.601053	0.629232
10	0.045610	4.326335	0.489663	93.34868	1.048214	0.787107

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Decomposition of LREER: Period	S.E.	LKLCI	INF	LM2	LREER	DUMMY
1	0.016675	5.548406	2.038309	3.213471	89.19981	0.000000
2	0.026363	6.919919	1.850716	5.493229	85.73323	0.002911
3	0.033836	13.05486	2.280717	4.509456	80.10092	0.054040
4	0.040984	17.21031	2.193950	3.797956	76.75931	0.038482
5	0.047063	18.95849	2.110909	3.710833	75.19048	0.029283
6	0.052225	21.03142	1.860380	3.748172	73.33292	0.027101
7	0.056989	22.32394	1.704932	3.607248	72.29666	0.067222
8	0.061510	22.46822	1.582620	3.865645	71.97930	0.104219
9	0.065160	22.61398	1.482150	4.055115	71.63430	0.214456
10	0.069431	23.20147	1.347672	4.038951	70.95072	0.461184

Variance Decomposition of DUMMY: Period	S.E.	LKLCI	INF	LM2	LREER	DUMMY
1	0.054151	0.013370	0.508928	0.051161	0.001115	99.42543
2	0.081518	0.215000	25.26635	0.134613	0.111854	74.27218
3	0.104273	0.206714	36.91651	0.126341	0.251188	62.49925
4	0.125104	0.237565	43.77911	0.271466	0.253722	55.45814
5	0.141270	0.302936	46.26216	0.433792	0.577605	52.42351
6	0.156781	0.413642	48.21948	0.742247	0.783533	49.84109
7	0.170909	0.546975	49.95267	1.147194	0.810220	47.54294
8	0.183625	0.569861	51.52780	1.541046	0.743502	45.61779
9	0.196223	0.646829	52.95845	1.715583	0.719535	43.95961
10	0.208554	0.590855	54.23680	1.849436	0.782087	42.54082

Cholesky Ordering: LKLCI INF LM2 LREER DUMMY

APPENDIX 8: IMPULSE RESPONSE FUNCTION