

**KLSE COMPOSITE INDEX AND MACROECONOMIC FUNDAMENTAL  
DYNAMIC INTERACTIONS**

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**KLSE COMPOSITE INDEX AND MACROECONOMIC FUNDAMENTAL  
DYNAMIC INTERACTIONS**

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## **ABSTRACT**

This thesis employs Granger causality test to investigate causal relations and dynamic interactions among Malaysia's macroeconomic variables and Kuala Lumpur Stock Exchange Composite Index (KLCI). This research investigates the possible causal relations for different economic conditions in Malaysia by using three hundred thirty six monthly data points from January 1977 to December 2004. The macroeconomic variables being investigated are industrial production index, consumer price index, money supply measured by M1, three month fix deposit rate, Treasury bill rate and foreign exchange. The findings show that normally market is efficient and KLCI is a leading indicator for Malaysia's macroeconomic variables. However there are times when Efficient Market Hypothesis (EMH) is violated, i.e. the market is inefficient. When market is inefficient, past macroeconomic variables can better predict KLCI. From the findings, inefficient market normally happened during economic crisis that is when government intercepts the market to control the crisis from further deteriorate through either monetary or fiscal policies.

## **ABSTRAK**

Tesis ini menggunakan teknik “Granger Causal” untuk menyiasat kewujudan hubungan causal dan dinamik antara faktor makroekonomi dan KLCI. Penyelidikan ini menyiasat kemungkinan kewujudan hubungan causal bagi keadaan ekonomi Malaysia yang berlainan dengan menggunakan tiga ratus tiga puluh enam data bulanan dari Januari 1977 sehingga Disember 2004. Faktor makroekonomi yang dikaji ialah, Indeks Produksi Industri, Indeks Harga Pengguna, bekalan wang secara kecil (M1), kadar faedah simpanan tetap tempoh tiga bulan, kadar faedah perbendaharaan dan kadar pertukaran wang asing. Keputusan kajian menunjukkan bahawa pada keadaan normal, pasaran adalah efisien dan KLCI merupakan indikasi utama faktor makroekonomi. Namun, terdapat juga masa di mana pasaran adalah tidak efisien. Apabila pasaran tidak efisien, faktor makroekonomi lepas dapat menganggar KLCI dengan lebih tepat. Daripada kajian ini juga, pasaran tidak efisien lazimnya berlaku apabila negara menghadapi krisis ekonomi; iaitu apabila campurtangan kerajaan dalam pasaran berlaku melalui polisi kewangan ataupun fiskal.

## **Chapter 1**

### **INTRODUCTION**

#### **1.1 Introduction**

There are two sources of uncertainty in asset returns. These uncertainty sources are macroeconomic factors and firm specific events. Firm specific events or risk only affect a particular firm and this risk can be minimized or avoided by diversifying the investment portfolio. On the other hand, macroeconomic factors are not diversifiable; hence, they affect all firms in a stock market. Investors are rewarded with higher expected return for their exposure to macroeconomic factors, but are not rewarded for exposure to firm specific uncertainty (Bodie, Kane & Marcus, 2004). Therefore by having a better knowledge of whether a macroeconomic factors would affect stock market, the investor could better control undiversifiable risk in his or her investment, thus the return of the investment can be improved. Besides that, the knowledge of macroeconomic variable can better predict stock market can also give rise to arbitrage possibility which enables abnormal profit to be earned with this knowledge. The relationship between macroeconomic variables and stock price has been mainly investigated assuming that macroeconomic fluctuations would influence the stock prices through their impact on future cash flows of a company (Muradoglu, Taskin & Bigan, 2000; Chen, Richard & Ross, 1986; Geske & Roll, 1983; Fama, 1981). Earlier studies on macroeconomic variables influence on share market were motivated by Arbitrage Pricing Theory (Muradoglu et al., 2000).

## **1.2 Nature of Problem**

There are earlier researches on macroeconomic variables' impact on stock market done on various countries; Brazil (Adrangi, Chatrath, Pamplin & Sanvicente, 2002), Norway (Gjerde & Sættem, 1999), Japan (Hamao, 1988; Mukherjee & Naka, 1995), UK (Poon & Taylor, 1991; Cheng, 1995), United States (Chen et al., 1986; Fama, 1990; Fama 1991) etc. The results from these studies have suggested that there exist significant relationship between macroeconomic variables and stock market of most of the countries. Therefore by knowing the exact relationship between macroeconomic variables and stock market, it is possible to earn abnormal profit by using the macroeconomic as a predictor for stock market movements.

Even though there are a lot of similar studies done on United States, only limited studies are done on emerging market and developing countries. According to Muradoglu et al. (2000), the relationships between macroeconomic variables to stock market returns for emerging markets are due to the overwhelming influence of governments in the economic activity and that company-specific information is not always timely. This causes stock markets for emerging countries are influenced by economic policy which is different from developed countries. Therefore, even though there are a lot of researches done on developed countries like United States and Japan, they can not be directly applied to developing countries like Malaysia.

Besides the known limitation of applying findings done on developed countries to emerging countries, evidences also show that interaction between macroeconomic variables and stock market for major markets may not apply to other stock markets. There are few earlier research papers that have concluded this. Gjerde and Sættem (1999) for instance have argued, using Norway as an example, a country's economy sensitivity, and industry structure and business nature of

companies listed on the country's stock market may explain the different behavior of similar macroeconomic variables have on different stock markets. Research done by Wongbangpo and Sharma (2002) is also consistent with this and has shown that similar macroeconomic variable can have different influence on stock market of different countries. Their analysis data has shown that money supply has positive influence on Malaysia, Singapore and Thailand's stock market which is consistent with analysis done by Mukherjee and Naka (1995) for Japan and Dhakal, Kandil and Sharma (1993) for United States. However the same analysis also shown that the same macroeconomic variable; i.e. money supply has a negative influence on Indonesia and Philippines stock market. Poon and Taylor (1991) has carried out similar tests on UK using similar tests done on US by Chen et. al (1986). Poon and Taylor's results show that similar variable used by Chen et. al do not affect the share price in the UK in the way described by Chen at. al. Poon and Taylor argued that it could be due to other macroeconomic factors that are at work or the methodology used is inadequate to detect the pricing relationship (1991). Therefore findings on interaction between macroeconomic variables and stock market for a particular country can not be directly applied to another country. This has further complicated the situation, because now analysis needs to be done on the country of interest in order to know the actual interaction between its macroeconomic variables and stock market.

Another problem and difficulty of trying to directly apply empirical results done in one country to another is the lack of exactly similar macroeconomics variables (Hamao, 1988). Hamao in his research trying to investigate APT in Japanese markets has faced difficulty of applying tests done on US by Chen et al. (1986). This difficulty was due to different markets development history of the countries, thus

resulting in directly applying tests done in one country to another is difficult if not impossible.

Therefore to understand the dynamic interaction between macroeconomics variables and stock market for Malaysia which possibly can give rise to arbitrage opportunity, separate research and analysis should be done for Malaysia.

### **1.3 Research Question and Purpose of Research**

Contrary to the Efficient Market Hypothesis (EMH), from other earlier studies on developed countries, it is known that significant relationship between macroeconomic variables and stock market exist. This significant relationship can give rise to arbitrage opportunity and also minimize the undiversifiable risk in an investment portfolio if it is well known. It is also known that these relationship found on one country can not be directly applied to others.

Therefore the purpose of this research is to empirically test whether Malaysia's macroeconomic variables, namely industrial production index, consumer price index, money supply, interest rate and foreign exchange rate can better predict Kuala Lumpur Stock Exchange Composite Index (KLCI). In other word, the purpose of this research basically is to test whether we can use a priori knowledge of the mentioned past macroeconomic variables to predict current KLCI. If the relationship between macroeconomic variables and KLCI exist, this research will also try to explain the reason of the existence of this relationship.

This research is a Malaysia centric research and it goes one step further by incorporating Malaysia's economic development and cycle in the analysis. The data collected is broken down into different period and analyzed. These different periods reflect the different economic conditions of Malaysia.

This research will attempt to answer the following questions.

1. Are there any statistical significant causal relationships between macroeconomic variables investigated and KLCI?
2. Does this statistical significant causal relationship exist for different Malaysia economic conditions?
3. Why do statistical significant causal relationships exist?
4. Are there any general rules regarding this macroeconomic variables and KLCI causal relationship that can be derive so that we can apply in the future?

#### **1.4 Significance of The Study**

There are limited studies on macroeconomic variables relationship with the stock market performance for Malaysia. Even though there are few earlier studies involving Malaysia (Habibullah & Baharumshah, 1996; Ibrahim, 1999; Muradoglu, Taskin & Bigan, 2000; Wongbangpo & Sharma, 2002), these analyses only used data up to 1997. Besides that these earlier studies treat the data as a single period; therefore these analyses do not take into consideration about the economic development in Malaysia.

This research contributes in the following areas

1. It extends the data being analyzed to December 2004. By including data after 1997, the data should be able to capture and reflect significant monetary policy changes in Malaysia which happened in 1997; i.e. pegging of Ringgit to USD.
2. Unlike earlier researches on Malaysia, this research investigates how the macroeconomic variables and KLCI causal relationship change when Malaysia is under different economic conditions. This is done by grouping the monthly data into growth, crisis and post crisis period.



3. This research also tries to explain the reason for the causal relationships between the macroeconomic variables and KLCI through development in Malaysia.

## **1.5 Organization of the Study**

The chapters of this thesis are organized in the following sequence. Chapter 1 provides the introduction, states the research purpose and questions and the organization of the study. Chapter 2 reviews the relevant previous empirical research and findings on macroeconomic variables and stock market performance relationship. This chapter explains the possible reason for the causal relationship. It also provides the general hypothesis for this research. Chapter 3 describes the hypotheses to be tested. Chapter 4 explains the research methodology, how the data is grouped according to economic condition and the statistical techniques used in this study. Chapter 5 reports the results of the analyses. Chapter 6 discusses the possible reason for the causal relationship existence, conclusion, states the limitations of the study as well as propose suggestions for future research.

## **Chapter 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

In this chapter, the review of the literature is presented. A brief introduction on KLCI and factors affecting the stock market are presented in this chapter. Then how macroeconomic variables can Granger cause KLCI is presented subsequently. In this research only six macroeconomic variables are being investigated. After that, a brief discussion on analysis techniques used by earlier researches is presented. This chapter is ended by a review of earlier similar researches involving Malaysia.

#### **2.2 KLSE Composite Index**

Stock market indices are normally used to indicate the performance of a stock market as a whole. A stock market index can be calculated based on all the stock listed on the stock exchange or only a sample of stocks listed. KLSE Composite Index (KLCI) is by far the most widely followed stock market indices for Malaysia stock market. For KLCI, only a number of listed companies are used to compute the index. There are total one hundred listed companies being used to compute KLCI. The actual component of companies used to calculate KLCI might change from time to time.

Besides as an indicator that reflects the performance of Malaysia stock market, KLCI also indicate the confidence level and expectation of investors about the performance of Malaysia economy.

### **2.3 Factors Affecting the Stock Market**

There are two sources of uncertainty in asset returns which in turn affect the stock market performance. These sources of uncertainty are namely macroeconomic factors and firm-specific events (Bodie et al., 2004). Therefore stock variability can be decomposed into market or systematic risk and firm-specific risks.

Systematic risk includes the uncertainty about the business cycle, interest rates, inflation, foreign exchange and country's production (Bodie et al., 2004). Systematic risk affects the fortune of many firms, thus unexpected changes in these variables can cause an unexpected change in the rate of return and performance of the entire stock market.

Firm specific event or risk on the other hand includes new inventions of a firm, deaths of key personnel, expiration of patent and etc. Firm specific events only affect the fortune of an individual firm without affecting the broad economy (Bodie et al., 2004). Since firm specific risk is independent for each firm, therefore the firm specific risks are diversifiable.

In this research, systematic risk is being investigated. Out of all the systematic risks, this research focuses on the macroeconomic factors that affect the stock market performance.

### **2.4 Macroeconomics Variables Affecting Stock Market**

Since stock market index is composed of all or part of the companies listed, so changes in share prices would affect the stock market index. There are a lot of factors that can affect the performance of the stock market; however in this research we are only interested to investigate stock market performance and its relationship to macroeconomics variables. The choice of the variables is based on by the basic

economy theory of asset pricing, which would be applicable regardless of the market location (Hamao, 1988). Standard models of share price is equal to the discounted sum of share's future returns and is given by (Gjerde & Sættem, 1999)

$$P_0 = \sum E(c_t)/(1+k_t)^t \quad (1)$$

where

$P_0$  = the share price,

$E(c_t)$  = expected returns

$k_t$  = discount rate.

So a change in either or both expected returns and discount rate will affect share prices. Macroeconomic variables that were proposed by Chen et al. (1986) in their paper were based on the variables' influence on future cash flows of stock price. In this research six macroeconomics variables were being investigated, there were productivity, inflation, money supply, interest rate and foreign exchange.

#### **2.4.1 Productivity, Gross National Product & Industrial Production Index**

A nation's output can Granger caused stock market movement through the impact on the corporate profitability. Based on Geske and Roll (1983), Chen et al. (1986) and Fama's (1990) researches, Gross National Product (GNP) is hypothesized to have a positive relation with stock prices. The increase in the output may increase expected future cash flow of the corporate and thus, raises the stock prices (Wongbangpo & Sharma, 2002). Because GNP is not available on a monthly basis, so Industrial Production Index (IPI) is used in this analysis. The effect of IPI on stock market is similar to effect of GNP on stock market (Abdullah & Hayworth, 1993).

In this research, the general hypothesis involving industrial production index is as follows:

$H_{01}$ : Malaysia's output measured by industrial production index has no causal relationship with Malaysia stock market performance.

$H_1$ : Malaysia's output measured by industrial production index has causal relationship with Malaysia stock market performance.

#### **2.4.2 Inflation, CPI**

Earlier studies by Geske and Roll (1983) and Modigliani and Cohn (1979) have conflicting ideas on how inflation can Granger causal stock market movement. Based on Fisher hypothesis, stocks can be used to hedge against inflation (Lee 1992). According to this hypothesis, inflation and stock prices should have a positive correlation because as the inflation increase, more people will buy stocks to hedge against the inflation. This action will drive up the stock prices due to higher demand in stocks (Abdullah & Hayworth, 1993). However most of the empirical findings do not support this positive relationship. To the contrary, these empirical analyses show a negative correlation between inflation and stock prices. According to Adrangi et al. (2002), negative relationship between inflation and stock returns in developed markets are the results from "proxy effect". According to "proxy effect", the negative relationship between inflation and stock returns reflects the harmful effect of the inflation on the real economic activity (Adrangi et al, 2002). Fama argues that proxy effect disappear when real activity does not fall because of inflation (Adrangi et al, 2002).

There are two ways to explain this negative correlation between inflation and stock price. One is through the impact of discount rate while the other is through the impact of future cash flows. Increase in inflation is expected to increase the nominal risk free rate in order to manage the inflation to a certain level. The increase in

nominal risk free rate will in turn increase the discount rate used in valuating the stock. Thus for a fixed cash flow company, inflation will drive the stock price down. Another way to explain this is, inflation raises a firm's production costs. In a competitive economy, the firm is not able to pass extra cost due to inflation to its customer, this will steer the customers to its competitors. As a result, the firm needs to absorb the rise in production cost which will decrease the firm's future cash flow, thus lowering its revenue. So the increased in price level will have a negative impact on stock price; i.e. increase in price level will lower the stock price. Earlier studies done by Fama (1981), Chen et al. (1986) and Wongbangpo and Sharma (2002) supported this thought.

In this research, the general hypothesis involving inflation is as follows:

H<sub>02</sub>: Malaysia's inflation has no causal relationship with Malaysia stock market performance.

H<sub>2</sub>: Malaysia's inflation has causal relationship with Malaysia stock market performance.

### **2.4.3 Money Supply, M1**

Similar to inflation, there are also conflicting ideas on how money supply can Granger causal the stock market movement. According to Quantity Theory of Money (Brunner, 1996, Friedman, 1961; and Freidman & Schwartz, 1963), increase in money supply will cause the change of equilibrium position of money with respect to other assets in the portfolio of asset holders. This adjustment will change the demand for other assets that compete with money which includes equity shares. Increase in money supply is expected to create additional supply of money balances in a portfolio. The new portfolio equilibrium will turn some of this additional money balances to equity which

in turn causing a demand for shares to increase. The increase of demand on share will cause the share prices to rise (Dhakal et al., 1993). This explains the positive effect of money supply on stock prices. On the other hand, a rise in the money supply will create excess supply of money chasing for a limited amount of goods and services. In the long run, the increase in the money supply will be absorbed in the price level which in turn stimulates inflationary expectation. Inflationary expectation will cause the nominal interest rate to increase. Higher nominal interest rate will steer investors away from holding equity to holding money balances in their portfolios (Dhakal et al., 1993). Besides, as explained earlier, an increase in price level in a competitive economy will raise the production cost thus lower the revenue of a firms. Higher nominal interest rate and higher production cost as a result of increase of money supply explain possible negative effect of stock price with money supply. Homa and Jaffee (1971) and Hamburger and Kochin's (1972) previous researches have shown that past increased in money supply has caused the increase in stock prices while Rozeff (1974) and Davidson and Froyen's (1982) research have shown that past increase in money supply has caused stock prices to drop (Abdullah & Hayworth, 1993).

In this research, narrow money, M1 is used as the proxy for money supply because this variable was used in some of the earlier researches (Abdullah & Hayworth, 1993; Dhakal, Kandil & Sharma, 1995; Ibrahim, 1999; Wongbangpo & Sharma, 2002). The general hypothesis involving money supply is as follows:

H<sub>03</sub>: Money supply, M1 in Malaysia has no causal relationship with Malaysia stock market performance.

H<sub>3</sub>: Money supply, M1 in Malaysia has causal relationship with Malaysia stock market performance.

#### 2.4.4 Interest Rate

Interest rate is important for asset pricing. An increase in the interest rates will also raise the required rate of return. Investor's decision to hold an asset is affected by nominal interest rate, which is a measure of opportunity cost. A rise in the opportunity cost will motivate the investor to substitute equity shares for other assets in their portfolios. Therefore, an increase in the nominal interest rate will have negative impact on the stock prices as investors trying to adjust their portfolios by selling equity which drive down the stock prices (Wongbangpo & Sharma, 2002). Increase in interest rate may also cause recession which causes a decline in future corporate profitability (Wongbangpo & Sharma, 2002). Financing costs will also increase following the increase of the interest rate. Increase in the financing costs will again decrease corporate profitability, thus decrease in share prices (Wongbangpo & Sharma, 2002).

In this research, two interest rates; i.e. three month fix deposit rate and Treasury bill rate are used as the proxy for interest rate. Treasury bill rate is used due to some of the earlier researches were using Treasury bill rate as the proxy for interest rate (Chen et al.,1986; Dhakal et al., 1995). On the other hand, three month fix deposit rate is used because it is an alternative investment method that is easily accessible by public Malaysian, therefore this interest rate is chosen. Besides that three month fix deposit rate was also used by Muradoglu et al. (2000) in their research. The general hypothesis involving interest rate is as follows:

H<sub>04</sub>: Malaysia's treasury bill has no causal relationship with Malaysia stock market performance.

H<sub>4</sub>: Malaysia's treasury bill has causal relationship with Malaysia stock market performance.



H<sub>05</sub>: Malaysia's three month FD rate has no causal relationship with Malaysia stock market performance.

H<sub>5</sub>: Malaysia's three month FD rate has causal relationship with Malaysia stock market performance.

#### **2.4.5 Exchange Rate**

Exchange rates have been shown to have positive influence stock prices (Muradoglu et al., 2000). Exchange rates can Granger caused stock market movement through the trade effect (Muradoglu et al., 2000). For an export goods which has an elastic demand, depreciation of domestic currency will increase the volume of exports which in turn causes higher cash flows for the domestic companies. This increase in cash flows will causes the stock price of the domestic company to increase (Mukherjee & Naka, 1995; Muradoglu et al., 2000).

Malaysia economy is oriented toward international trade; therefore volatility in foreign exchange rates would have a substantial systematic effect upon Malaysia equities. Besides that, Malaysia also highly depends on foreign investments and savings to fund the investments within the country especially during the early 90's. On September 1998, Malaysia had introduced Malaysia Ringgit peg with US Dollar after impacted by the Asia financial crisis. Hence Malaysia Ringgit is pegged to US Dollar at a fix rate of RM3.80 per US Dollar. This has caused international trade to be more stable and shielded from the currency exchange risk.

In this research, the general hypothesis involving exchange rate is as follows:

H<sub>06</sub>: Malaysia's exchange rate has no causal relationship with Malaysia stock market performance.

H<sub>6</sub> Malaysia's exchange rate has causal relationship with Malaysia stock market performance.

## 2.5 Analysis Techniques Used by Earlier Researches

There are a lot of researches on macroeconomic variables and stock market performance done earlier. These researches were using different analysis methods. Earlier stock market performance analysis was performed using Regression (Fama, 1981; Geske, 1983). Following that, Chen et al. (1986), Hamao (1988) and Poon and Taylor (1991) utilized Fama-Macbeth (1973) and its variant's two-stage regression technique. In Chen et. al's (1986) Fama-Macbeth (1973) technique, return model was as follows

$$R = a + \sum b_i X_i + e \quad (2)$$

Where

$R$  = return of stock market

$b_i$  = loadings on the  $i$ -th macroeconomic variable

$a$  = constant

$e$  = error term

In this technique a sample of assets was chosen, and then the assets' exposure to the economic state variables were estimated by regressing their returns on the unanticipated changes in the economic variables over a sample period (Chen et al 1986). After  $b$  was being estimated, it is used as independent variable in equation (2) above and regression for the following yearly data was performed using these estimated variables,  $b_i$ . This provides yearly estimate for these macroeconomic variables  $X_i$  and then the time series means of these estimates were tested by the  $t$ -test for significant difference from zero (Chen et. al., 1986). However according to Cheng

(1995), the first drawback for this method was the analysis was very sensitive to the number of independent variables that were included in the regression. The second drawback was that separate multiple regression analysis of each variables used in this method would neglect the interrelations of the sets of variables when they coexist. Hamao (1988) has also given the drawbacks of the method used by Chen et al. (1986). The drawback according to Hamao (1988) was the arbitrary specification of the economic factors. Besides that the period used to estimate the  $b_i$  also posed a challenge because macroeconomic data was noisy, so the arbitrary period used may not be very accurate.

Factor analysis was also being used in the earlier analysis to extract systematic factors that influence stock returns. Even though this method able to find appropriate number of factors that were significant in asset pricing, the extracted factors did not have economic meaning (Hamao, 1988).

In the 1990s, Vector Autoregression (VAR) analysis was used for these studies (Lee, 1992; Abdullah & Hayworth, 1993; Dhakal, Kandil & Sharma, 1995, Gjerde & Sættem, 1999). Vector Autoregression (VAR) is normally used for forecasting interrelated time series system and to analyze the dynamic impact of random disturbances on the system (Eviews 4 User's Guide, 2002). VAR analysis treats all variables as endogenous and imposing no restriction based on a priori knowledge (Lee, 1992). However, according to Mukherjee and Naka (1995), VAR method has its drawback. VAR is imperfect because of its failure to include potential long-term relations between the factors and thus may suffer from misspecification bias (Mukherjee & Naka, 1995); i.e. earlier research was focused on short term relationship between the stock performance and macroeconomic variables.

According to Johansen and Juselius (1990), estimation and testing of long-run relations were done using cointegration and canonical analysis. Mukherjee and Naka (1995) performed cointegration to test for long-term equilibrium relations among factors. The purpose of cointegration test is to determine whether a group of non-stationary series is cointegrated; i.e. whether a stationary linear combination exists among these individually non-stationary factors. There is long term equilibrium relation between these factors if linear combination exists. Mukherjee and Naka (1995) used Vector Error Correction Model (VECM) for cointegration test. On the other hand, Cheng (1995) used canonical analysis to investigate stock market and economic factors in UK.

In the late 1990s, Granger Causality test was being used for these studies (Ibrahim, 1999; Muradoglu et. al, 2000; Wongbangpo & Sharma, 2002). Correlation between variables does not necessarily mean causation. The Granger Causality test to see whether  $x$  causes  $y$  is by seeing how much of the current  $y$  can be explained by the past values of  $y$  and then see whether adding lagged values of  $x$  can improve the explanation. If  $x$  helps in the prediction of  $y$ , then  $y$  is said to be Granger-caused by  $x$ .

## **2.6 Granger Causality**

Granger caused is frequently used throughout this research report.  $y$  is said to be Granger caused by  $x$  or  $x$  Granger caused  $y$  if  $x$  or lagged  $x$ s helps in the prediction of  $y$ . Please refer Chapter 4, Section 4.4.2 for more detail explanation of Granger causality test.

## **2.7 Previous Analysis on Malaysia**

There are only limited numbers of analysis involving Malaysia (Habibullah & Baharumshah, 1996; Ibrahim, 1999; Muradoglu, Taskin & Bigan, 2000; Wongbangpo & Sharma, 2002).

Habibullah and Baharumshah (1996) used residual-based cointegration tests and found no evidence for cointegration between stock indices, money supply and output using monthly data from January 1978 to September 1992.

Ibrahim (1999) used both cointegration and Granger causality tests for his analysis. The macroeconomic variables being investigated were consumer prices, credit aggregate, official reserves, industrial production index, money supply and exchange rate. This analysis used monthly data from Jan 1977 to June 1996; i.e. data before Asia financial crisis and before Malaysia imposed currency control and Ringgit-US Dollar peg. Ibrahim's analysis found that there was cointegration between stock prices and three macroeconomic variables; i.e. consumer prices, credit aggregates and official reserves. This same analysis also found that the stock prices had as significant causal role in the changes of industrial production, money supply and exchange rate.

Muradoglu, Taskin and Bigan (2000) in their work of investigating stock market returns and macroeconomic variables for emerging markets had included Malaysia in their analysis. Granger causality test was used in their analysis for monthly data ranging only from January 1985 to November 1996. The variables being investigated were inflation, exchange rate, interest rate and industrial production. Muradoglu, Taskin and Bigan's analysis concluded that there was no causal relationship between stock market return and macroeconomic variables.

Wongbangpo and Sharma (2002) had included Malaysia in their analysis of stock market and macroeconomic fundamental interactions of five ASEAN countries. In this research, both cointegration and Granger causality tests were performed on gross national product (GNP), consumer price index, money supply, interest rate and exchange rate with Kuala Lumpur Stock Exchange Composite Index (KLCI). Monthly data from 1985 to 1996 was used in their study. In this study, Malaysia's stock prices were positively related to interest rate, money growth and exchange rate. On the other hand it has negative relationship with price level. The same research has shown that macroeconomic variables: gross national product, monetary growth and interest rate has Granger-caused stock prices in Malaysia; i.e. historical values of economic activities can predict current and future stock price movements.

There are two commonalities among these earlier studies involving Malaysia. All these researches treated the data in a single period. Therefore these researches were not able to investigate the causal relationship between KLCI and macroeconomic factors based on the development and economic conditions of Malaysia. Besides that, all of these researches were using data up to 1996 which were not able to capture the possible affect of monetary changes that happened in end of 1997; i.e. currency control.

## **2.8 Summary**

In general, earlier studies have shown that some of the macroeconomic variables have causal relationship on stock market. There were a few analysis techniques used in these earlier researches to study the relationship between macroeconomic variables and stock market. For those analysis performed on Malaysia, it was found that the

results of the analysis were not consistent which might caused by different analysis technique and duration of the data being used.

## **Chapter 3**

### **THEORETICAL FRAMEWORK**

#### **3.1 Introduction**

This chapter extended the general hypothesis developed under the Macroeconomic Variables affecting Stock Market Section in Chapter 2. In this research, the same macroeconomic variables are being investigated for multiple periods reflecting different economic conditions in Malaysia; therefore the general hypothesis developed in Chapter 2 is expanded to cover these different time periods.

#### **3.2 Hypotheses Development**

Based on analysis done through this research, from 1977 to 2004, Malaysia's economy can be broken down into five different economic conditions. These periods are as follows:

- a) 1977 to 1984: Steady economic growth
- b) 1985 to 1987: Economic crisis and recovery
- c) 1988 to 1997: Economic boom
- d) 1998 to 1999: Asian financial crisis and recovery
- e) 2000 to 2003: Post Asian financial crisis

Please refer to Chapter 4 for the details on how the economic period is determined. Because the main objective of this research is to investigate whether macroeconomic variables Granger caused KLCI for different economic conditions, therefore the same Granger causality tests between macroeconomic variables and KLCI were performed for the above five different economic conditions. Because of the hypotheses were repetitive and for space saving, only the general hypothesis is



stated in this chapter. Below are the general hypotheses developed in Chapter 2 which tests whether the output, inflation, interest rate and foreign exchange rate causal to stock market performance.

Chen et al. (1986), in their research has found that industrial production index was significant in explaining the expected stock return. Therefore to test the same macroeconomic variables on Malaysia context, hypothesis below is tested.

H<sub>01</sub>: Malaysia's output measured by industrial production index has no causal relationship with Malaysia stock market performance.

H<sub>1</sub>: Malaysia's output measured by industrial production index has causal relationship with Malaysia stock market performance.

Researches done by Fama (1981), Chen et al. (1986) and Wongbangpo and Sharma (2002) has found that inflation has negative impact on stock price. Therefore hypothesis below is tested to check whether inflation Granger cause Malaysia stock market.

H<sub>02</sub>: Malaysia's inflation has no causal relationship with Malaysia stock market performance.

H<sub>2</sub>: Malaysia's inflation has causal relationship with Malaysia stock market performance.

Homa and Jaffee (1971) and Hamburger and Kochin's (1972) research have shown that past increased in money supply has caused the increase in stock prices where else Rozeff (1974) and Davidson and Froyen's (1982) research have shown that past increase in money supply has caused stock prices to drop. The third hypothesis will test whether money supply measure by M1 Granger cause KLCI.

H<sub>03</sub>: Money supply, M1 in Malaysia has no causal relationship with Malaysia stock market performance.

H<sub>3</sub>: Money supply, M1 in Malaysia has causal relationship with Malaysia stock market performance.

Wongbangpo and Sharma (2002) in their research have shown that interest rate Granger caused stock market in five ASEAN countries. Based on the finding of this earlier research, the general fourth and fifth hypothesis are as follows.

H<sub>04</sub>: Malaysia's treasury bill has no causal relationship with Malaysia stock market performance.

H<sub>4</sub>: Malaysia's treasury bill has causal relationship with Malaysia stock market performance.

H<sub>05</sub>: Malaysia's three month FD rate has no causal relationship with Malaysia stock market performance.

H<sub>5</sub>: Malaysia's three month FD rate has causal relationship with Malaysia stock market performance.

Since Malaysia is heavily dependent on international trade and foreign exchange is well known to affect the competitiveness of Malaysia as an international exporter, therefore the sixth hypothesis will test whether foreign exchange Granger caused KLCI.

H<sub>06</sub>: Malaysia's exchange rate has no causal relationship with Malaysia stock market performance.

H<sub>6</sub>: Malaysia's exchange rate has causal relationship with Malaysia stock market performance.

Therefore in this research hypotheses  $H_a$  to  $H_f$  above is repeated for the following periods

- a) 1977:1 to 1984:12
- b) 1985:1 to 1987:12
- c) 1988:1 to 1997:12
- d) 1998:1 to 1999:12
- e) 2000:1 to 2004:12

Therefore there are total thirty hypotheses tested in this research, which representing six hypotheses test for each economic condition.