

**The Impact of Macroeconomic Variables on Firm's Performance: Evidence from  
Malaysian GLC**

**By**

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## **ABSTRAK**

Kajian ini bertujuan menyelidiki kesan faktor ekonomi makro keatas harga saham Syarikat Berkaitan Kerajaan. Prestasi baik pergerakan harga saham kerap dikatakan disebabkan faedah daripada Program Transformasi Syarikat Berkaitan Kerajaan.

Model penyelidikan ini berasaskan kepada Teori Arbitrase Harga (Arbitrage Pricing Theory) oleh Ross (1976). Dengan mengaplikasikan kaedah kointegrasi Johansen, Model Vektor Pembetulan Ralat (Error Correction Model) dan Penyebab Granger (Granger Causality), kami mengkaji hubungan keseimbangan jangka panjang dan dinamik jangka pendek antara Indeks G-20 dan beberapa pembolehubah ekonomi makro iaitu pengeluaran industri, tahap harga, penawaran wang dan kadar faedah dengan menggunakan data di antara tahun 1988 dan 2008. Analisa kertas ini di bahagi kepada dua tempoh waktu; tempoh penuh dan tempoh dari 1988 hingga 1997 sebelum Krisis Kewangan Asia (Asian Financial Crisis)..

Kajian ini mendapati terdapat bukti bahawa harga saham dan pembolehubah makro ekonomi menunjukkan hubungan kointegrasi dan terdapat hubungan keseimbangan jangka panjang. Melalui Model Vektor Pembetulan Ralat didapati pengubahan keseimbangan jangka pendek adalah melaului saluran yang berbeza apabila dikaji dibawah tempoh waktu yang berbeza.

Akhir sekali, kami mengkaji penyebab Granger diantara harga saham dan pembolehubah ekonomi makro didalam jangkamasa pendek dan didapati hanya kadar faedah boleh ditaksirkan sebagai penyebab Granger terhadap harga saham didalam tempoh penuh.

## **ABSTRACT**

This study investigates the effects of macroeconomic factors on GLC share price returns in Malaysia. The performance of the share price was largely attributed to the GLC Transformation Program launched by the government.

To examine the impact of the macroeconomic variables on the share price, we developed a simple model based on the Arbitrage Pricing Theory by Ross (1976). By applying the techniques of cointegration, Error Correction Model and Granger causality, we examine the short run dynamics and long run equilibrium relationship between G-20 Index and the four selected macroeconomic variables of real output, price level, money supply and interest rate using monthly data from 1988 to 2008. The data was examined in two periods; whole sample period and a second sample period of up to 1997 before the Asian Financial Crisis.

The results suggest that the share price and the macroeconomic variables are cointegrated and there was evidence of long run relationships in the periods under study. Through the Error Correction Model we found that the short run adjustments were from different channels in different periods of study. Finally we examined the short run Granger causality to look at the causal relationship among the variables. We found that in the whole sample period only the past information on interest rate may be used to predict the share price and in the second sample no information from any of the macroeconomic variables may be used to predict share price.



# **CHAPTER 1**

## **INTRODUCTION**

“Any considerable improvement in the efficiency and performance of GLCs would bring about massive benefits, not only to the stock exchange, but also to the income, consumption and wealth of the nation”

Datuk Seri Abdullah Ahmad Badawi  
Prime Minister of Malaysia  
2004

### **1.1 Overview**

In Malaysia, Government Linked Companies evolved from branches of Government departments to incorporated entities and companies rescued by the Government during the Asian Financial Crisis. There are also companies from Greenfield start-ups (PCG, 2005). Examples include TM (evolved from Jabatan Telekom Malaysia), Telekom Malaysia International (TMI), Malaysian Airline System Berhad, Malayan Banking Berhad, Tenaga Nasional Berhad (previously known as Lembaga Letrik Negara), and Pos Malaysia & Services Holdings Berhad. The Government shareholding in these companies is held by Government Linked Investment Companies.

There are a total of 57 GLCs listed on the Bursa Malaysia with a workforce of about 400,000 or 5% of the nation's workforce (PCG, 2005). The twenty largest market capitalized GLCs also known as G-20 companies operate in various industries sectors such as construction, consumer products, finance, industrial products, plantation and trading and services. As of May 2004, the market capitalization of G-20 was RM 145 billion. By November 2007 the figure had increased to RM 266 billion against the target of RM 250 billion to RM 300 billion (PCG, 2008). As a comparison, the total market capitalization for Bursa Malaysia comprising of 989

companies as at November 2007 was RM 1,065.32 billion (Bursa Malaysia, 2007). This represents about 25% from total market capitalization.

With such significant presence in the country's economy, the Government realizes that transforming GLCs into high-performing entities would be critical for the country's future economic prosperity. In 2004, Dato' Seri Abdullah Bin Haji Ahmad Badawi, then the Deputy Prime Minister, launched a program called the GLC Transformation Program and made it a national priority to transform GLCs into high performance entities in an effort to improve the performance of the GLCs further (PCG, 2005).

To facilitate the process of transformation, the Putrajaya Committee on GLC High Performance (PCG) was set up in January 2005. The principal mandate of the Committee is to design and implement comprehensive national policies and guidelines to transform GLCs into high performing entities and establish the institutional framework to program-manage and subsequently to oversee the execution of these policies and guidelines. The transformation program is based on three key principles; that the program is part of the larger national development strategies, that the program is focused on enhancing performance at the GLCs; and that the program takes full cognizance of matters relating to governance, shareholder value and stakeholder management (PCG, 2005).

Through these transformation initiatives, the Government expects to enhance improvements in the areas of performance, governance and effectiveness of the GLCs to drive the development and growth of the country's economy (Abdullah, 2005).

PCG reported that as a result of the transformation initiatives, the GLCs performance showed marked improvements. Total Shareholders Returns recorded an annualized growth of

18.6% for three years from 2004 -2007 beating the KLCI ex G-20 by 2.2%. Other performance measure, for example, return on equity grew from 11.5% to 16.9% over the same period (PCG, 2008).

Since the study by Chen et al. (1986), there has been many studies carried out on the relationship between share price (share returns) variability and macroeconomic factors especially for the developed markets such as Andersson and Lauvsnes (2007), Mukherjee and Naka (1995), Clare and Thomas (1994) and Ratanapakorn and Sharma (2007) for Norway, Japan, UK and USA respectively.

In this study we examine how GLC share prices are affected by the local macroeconomic variables in Malaysia. Dritsaki-Bargiota and Dritsaki (2004) observed that there is a consensus among macroeconomists and finance theorists that stock market prices are driven by macroeconomic variables, the so-called 'fundamentals' in the economy and the linkages between them are two-way.

Further, Maysami et al. (2004) observed that evidences accumulated in the last thirty four years showed that macroeconomic variables actually influence share price thus it is possible to predict the share price by studying the changes in these variables. It is therefore, possible, for investors to make profit from shares trading.

In many studies of the relationship between share price and macroeconomic variables, share price is usually proxied by the country's share index. In the Malaysian context, we find no study using a selected group of companies as a portfolio specifically for the case of GLCs. We constructed an index of the share prices of Malaysia's GLCs to proxy share returns. The GLC

companies in this study are those that are collectively called the G-20 companies. This would add to the limited resources in Malaysian GLC related literatures.

## **1.2 Problem Statement**

Considering the significant contribution and size of these GLCs, up until 2004, their measure of shareholders returns was not performing as well as the market, prompting the Government to take steps to remedy the situation. This situation changed after the implementation of the transformation program. According to the PCG (2007), G-20 make up about RM 266 billion or 25% of total market capitalization on the Bursa Malaysia in 2007 from RM 145 billion in 2004.

There are a number of studies examining the performance of Malaysian GLCs such as effects of Government ownership, economic value add, profitability and efficiency and these were compared with those of non-GLCs. Empirical evidences show that the results from the comparison were mixed but mostly the GLCs fared poorer compared to non-GLCs. Razak et al. (2008) suggested the reason of poor GLCs performance may be attributed to social altruism and agency problem. Decisions may not be profit motivated (due to the effect on the well being of citizens). The Malaysian government is not the owner and thus the absence of personal interest brings no benefit to the management to ensure good governance.

A study undertaken by CIMB showed that up to 2004 GLCs underperformed the broader Malaysian market on all key financial indicators except for size but these measures improved a year later especially in measures of capital appreciation and dividend yield (PCG, 2005).

Following the launch of the GLC Transformation Program, Datuk Azman Mokhtar, Managing Director of the Government's investment arm Khazanah Nasional Berhad, pledged that GLCs would ride on the objectives of the transformation to build shareholders' value by share price and dividend payout increase (Gunasegaram, 2004). It was estimated that with performance improvements, GLCs may contribute up to RM 300 billion in market capitalization in the following five to seven years (PCG, 2005).

These expectation and initiatives by the GLCs to achieve this target got investors excited because it addresses probably the most important issue to the investors – shareholders returns (share price and dividends). Investors naturally seek for the maximum potential return and at the same time attempt to minimizing the risks associated with an investment.

The Government's effort to increase shareholders value of GLCs must consider the factors that may affect share price. Increasing shareholders value through improved performance would be taking the effort in the right direction since theoretically stock prices should reflect future corporate performance and corporate profits generally reflect the level of economic activities (Maysami et al., 2004). But share prices are also affected by other external economic factors and GLCs must manage these factors such as the general economic environment brought about by monetary and fiscal policy. Having the knowledge how these factors affect share prices may help GLCs to anticipate and perhaps take measures to counter the effects to fulfill their objective in increasing shareholders values.

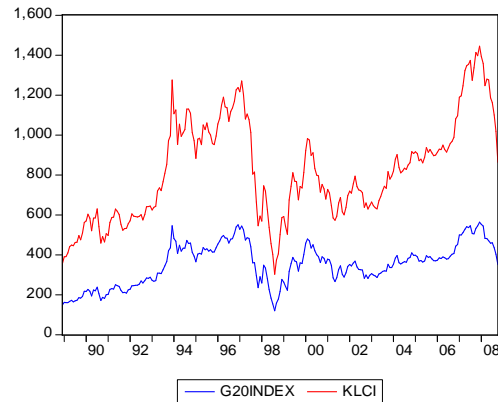
The benefit of the information of the effect of economic factors to the share price differs in its usefulness between investors, the management and the government as interested parties to

the GLCs. This information would be useful to investors in managing their portfolio trading in GLC shares.

As for the government, it is unlikely to trade share of GLCs as a profit venture. Its involvement in these companies is mostly as a means of protecting strategic and key services. The government is quite content to benefit from dividends and taxation on the profit of these GLCs. But the Malaysian government and the management of the GLCs may use this information in taking necessary measures to protect the shareholders value.

However, there have been cases where the government takes active participation in share purchasing activity in the open market. For example, the General Election in March 2008 saw the ruling party to lose the two thirds majority in the Parliament. In addition, the pending recession in the US and the uncertainty in the nation's politics saw the stock market dropped to its lowest level in twelve months. Filings with Bursa Malaysia showed that Khazanah Nasional bought 2.9 million BHB share and 5.1 million UEM shares in an effort to stop the slide of these share prices (Government keeps watch on GLC stocks, 2008).

The focus of this paper is to understand how G-20 share prices are affected. Figure 1 in the following page shows the performance of the G-20 Index against the Malaysian market barometer, the Kuala Lumpur Composite Index (KLCI) during the 1988 to 2008 period. It is interesting to note that the movements of the two indices follow very similar patterns. This is not surprising given the significant GLC companies market capitalization in the Bursa Malaysia. Is this the case of the broader market influencing the G-20 Index? Or perhaps it is the G-20 Index that is influencing the KLCI? It could also be that the two indices influence each other as a cointegrated series.



**Figure 1: Movements of G-20 Index and KLCI.**

Looking at the graph, since the commencement of the transformation program in 2004 until 2007, it was reported that the shareholder values has improved tremendously and the G-20 market capitalization has managed to increase to RM 266 billion in 2007 making up about 25% of the total market capitalization in Bursa Malaysia compared to RM 145 billion in 2004 and outperforming the KLCI (ex GLC) by about 3.3%.

From evaluation on the milestone of the program in 2007, GLC share prices continue to trend upwards until March 2008. However, pointing the reason of the improvement due to the transformation program may be giving it too much credit. As we can see, even with the transformation program in place and ongoing, the GLC share prices still fluctuate especially in 2008 after the General Election where prices dropped to the level in 2007. Furthermore, the G-20 Index has been hovering in a band of around 120 points to 563 points in the duration of almost 20 years. Meanwhile, the KLCI is wider in the range from the low of 302 points to the highest in history at 1445 points during the same period.

Herein lays the problem that we are studying: if the transformation program plays a significant role in the contribution to the increase in the share price performance of the G-20 companies, the question is why did the GLC share prices dropped after the General Election in 2008? This shows that company performance in terms of shareholders value is not dependent only on the efficiency and internal improvements alone. If the pillars of the transformation program can ensure to deliver consistent shareholder value performance then the fluctuation in the graph above would not be seen although a small variability is understandable.

Unlike general price level, share price do not increase indefinitely; at least in the Malaysian case. This shows that there are other factors that influence share price such as macroeconomic information and investors' perception. But investors' perceptions are derived from market information (often referred to as the 'fundamental') such as macroeconomic information. If it is any indication, national politics also seem to exert great influence on the shares price.

Therefore, it is imperative that the G-20 companies take cue from the changes in macroeconomic information as a critical factor in delivering the desired share price performance. If there is any consolation, the efficiency of internal process as driven by the transformation program could play a role in helping the GLCs in facing the changes and challenges brought about by the macroeconomic environment

Local macroeconomic factors have been found important influencing factors to the local market performance. For example, Bilson et al. (1999) found evidence to support that emerging stock markets (ESM) are segmented from the world markets and that local information has most effect on these markets. Further, Burmeister et al. (2003) noted that several economic forces such



as investor's confidence, inflation, real business activity, interest rate and market index consistently impact share returns as suggested by academic and commercial researches.

Drawing from the above findings, Malaysian economic information such as price level, output, money supply and interest rate are selected to examine their influence on the share price of GLCs. These findings motivate this study with the objective to establish these relationships to predict share price

In addition to being a pioneer study on GLC share prices, information on the linkages with the economic variables may be useful for the following reasons:

1. for investors in their trading strategies
2. to guide to the management of the GLCs in enhancing shareholders value and promoting favorable investors sentiments towards GLC shares
3. to guide the government in laying policies and take actions to spur the capital market hence the nation's economic well being.

### **1.3 Research Objective**

The objective of this study is to examine the linkages and causal relation between macroeconomic variables and share price by:

1. Investigating the impact of macroeconomic factors on GLC share price
2. Examining the implication of 1997 economic crisis on GLC share price
3. Identifying causality among the macroeconomic variables and GLC share price

The share price will be proxied by the G-20 Index and four local economic variables were selected namely real output, price level, money supply and interest rate. Our empirical

findings would reveal whether these macroeconomic variables follow previous findings that found economic factor  $t$  to influence share price.

Positive shareholders value through increase in share price and dividend payout may be achieved through improved performance and governance only if the investors perceive that these initiatives would bring the desired results. The investors evaluate these measures in their investment decisions. But the influence of the market forces would also exert pressure on these measures of share price and revenue such as consumer and investor's confidence and the general economic environments.

The transformation initiatives undertaken by the GLCs and monitored by the PCG have shown results in the measure of Total Shareholders Returns. Within three years, the GLCs managed to outperform the KLCI ex G-20 by 3.3 % in Total Shareholders Returns Index (TSR Index). However, as the graphs in Figure 1 indicate the KLCI also experienced increase and the period between 2004 and 2007 has seen the best performance the share prices in history.

#### **1.4 Significance of the study**

We find several studies on the linkages between macroeconomic variables and share price in the Malaysian context. However, most of them used the market index such as KLCI and Second Board index as proxies for share price, for example, Habibullah and Baharumshah (1996), Ibrahim and Yusoff (2001), Ibrahim and Aziz (2003), Phang (2006) and Yu (2005).

Thus far, we did not find any empirical studies on the cointegration of macroeconomic variables and the returns of shares of GLC companies. This presents an opportunity to contribute to the literatures in the Malaysian context. The objective of this research is not to seek the best

combination of GLC stock as a portfolio but rather to examine the behavior of the share prices due to the effects of a selected set of economic variables. With such significant influence of the GLC companies in the Malaysian economy, an understanding on the variability of their share price would be useful to the Management, policy makers and investors in general.

## **1.5 Definition of key terms**

Definitions of key terms are presented in this section to allow better understanding for the discussion in this study:

**Government Linked Companies (GLC)** are companies that have a primary commercial objective and in which the Malaysian government has a direct controlling stake. Controlling stake refers to the government's ability (not just percentage ownership) to appoint BOD members, senior management, make major decisions (e.g. contract awards, strategy, restructuring and financing, acquisitions and divestments etc.) for GLCs either directly or through government linked investments companies GLICs (PCG, 2005).

**Government Linked Investment Companies** are Federal Government companies that allocate some or all of their funds to GLC investments (PCG, 2005). These organizations include Khazanah Nasional Bhd (KNB), Permodalan Nasional Bhd (PNB), Employees Provident Fund (EPF) and Lembaga Tabung Amanah Tentera (LTAT).

**G-20** is a selection of 20 large market capitalization GLCs controlled by Government linked Investment Companies listed on the Bursa Malaysia. (The Star, 2008).

**G-15** is selection of 15 large market capitalization GLCs controlled by Government linked Investment Companies listed on the Bursa Malaysia. Other than large capitalization, we find no other criteria for the grouping of the companies under G-15 or G-20.

## **1.6 Organization of chapters**

The rest of this study is organized as follows. In Chapter 2, a review of the literatures is presented. Chapter 3 outlines the data selection and research methodology of the study. The results and analysis will be discussed in Chapter 4 and lastly the summary and conclusion of this research in Chapter 5.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Overview

In this chapter, we discuss the previous literatures on the linkages between macroeconomic factors and the share price and previous literatures on GLCs. We find few studies examining on the relationships in the Malaysian context. It is worth noting that most studies take the stock market index as the proxy of share returns.

#### 2.2 Theoretical review

The theoretical framework relates to the study of risk and returns of GLC shares. There are a few models often used to describe the relationships of risk and returns. CAPM for example, is a widely used model for estimating cost of capital and evaluating the performance of managed portfolio (Fama and French, 2003). Based on Harry Markowitz's Modern Portfolio Theory and developed by Sharp (1964) and Lintner and Mossin (1966), the CAPM provides that investors would be compensated for holding a risky asset.<sup>1</sup>

This model suggests that the expected return of an asset is comprised of two components; a risk free rate and a risk premium and its risk measure (Bodie et al., 2005). The model is expressed as follows:

$$E(r) = r_f + \beta [E(r_m) - r_f]$$

Where  $E(r)$  = expected returns,  $r_f$  = return from a risk free rate,  $\beta$  = risk coefficient of the market and  $E(r_m)$  = expected return from the market.

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<sup>1</sup> Cited in Bodie et al. (2005)

From the above, the return of an asset  $E(r)$  is dependent on the return from a risk free asset,  $r_f$ , and a premium of return from the market,  $E(r_m)$  with consideration of risk factor,  $\beta$ . The market represents the general economy. However, it would be difficult to measure all the factors affecting the economy into a single factor as suggested by the CAPM or to use the assumption that all assets have the same sensitivity to the systematic risks. In this instance, critics say that this model is too simplistic and applying the same factor to all types of assets would lead to poor empirical record (Fama and French, 2003).

While businesses may be impacted by economic factors, it is also noted that the effects vary a certain degree according to the types of business. For example, general price level would have fewer effects to a utility company as opposed to other companies in another industry for example, products and services.

Although easy to calculate, determining the variables in the equation pose a problem. Megginson et al. (2007) posed the following questions; as a start, the model predicts expected return for the next period. The period unit in the model was not specified whether daily, weekly, monthly or yearly. What reference would an investor use for the expected return? What would be the risk free rate? Changes in rates are also considered as a risk. Finally, returns to the market portfolio means all assets in the market must be included which is not possible since there is no index available allowing investor to hold a market portfolio.

Thus, while the CAPM is good for understanding the basic principal of measuring risk and the relationship of risks and returns, it is difficult to use in real world case. A critic of the CAPM, Fama and French offered an alternative for estimating the returns of a portfolio in the form of Fama and French's three factor model (Megginson et al., 2007). Their model suggested

that in addition to the excess return on the market used in CAPM, size of firms (market capitalization) and book-to-market values are included to explain the returns of a security or a portfolio of securities (Investopedia, 2008).

Fama and French three factor model is expressed as follows:

$$r_{it} = \alpha_i + \beta_{iM} R_{Mt} + \beta_{iSMB} SMB_t + \beta_{iHML} HML_t + \epsilon_{it}$$

where SMB = Small Minus Big i.e. the return of a portfolio of small stock in excess of the return on a portfolio of large stock, HML = High Minus Low i.e. the return of a portfolio of stock with a high book-to-market ratio in excess of the return on a portfolio of large stock with a low book-to-market ratio (Bodie, 2005).

One concern regarding Fama and French three factor model, however, is that the returns of a stock may be explained by a firm characteristics i.e. firm size and book-to-market ratio to represent systematic risks. However, Black asserts that this model's explanation on security returns could have been by pure chance.<sup>2</sup>

Since we want to examine a broader set of factor representing macroeconomic variables, we require a model that takes into account the sensitivities of an asset to different economic factors to explain the variations in the share prices. Thus, we develop a simple model based on Arbitrage Pricing Theory (APT).

APT was developed by Stephen A. Ross in 1976. Compared to CAPM and Fama and French's Three Factor Model, APT is less restrictive in employing the number of factors to explain stock returns (Bodie et al., 2005; Roll and Ross, 2003). In addition, researchers are free to select the type of factors according to preferences. In this study, we use four macroeconomic

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<sup>2</sup> Bodie et al. (2005)

variables as risk factors to the returns of GLC share prices as suggested by various APT literatures such as Brown and Otsuki (1991), Priestly (1996) and Kryzanowski et al. (1997).<sup>3</sup>

Chen et al. (1986) in their landmark research selected four factors in their studies; changes in expected inflation, unexpected inflation, industrial production, the risk premium and the term structure premium

There are many other examples of factors to be examined in the model and may include but not limited to GDP, oil price, employment, FDI, even commodity prices and stock market index. For example, Ibrahim and Yusoff (2001) used industrial production, inflation rate, money supply and exchange rate. The limitation of selection of factors in this model, if any, would depend on the researcher's criteria.

Therefore, given N factors, the model is expressed as follows:

$$\text{APT Multifactor model } R_i = a_i + \beta_{im} R_m + \beta_{i1} F_1 + \beta_{i2} F_2 + \dots + \beta_{iN} F_N + e_i$$

Where  $\beta$  is the sensitivity to the share returns influenced by the factor and F represent the factors. We shall use this model to test the explanation on the relationship of GLC share prices variability and the macroeconomic factors.

### 2.3 Empirical review

The relationship of stock returns and factors that influence the returns are well documented for various markets. Most studies take the market indices to proxy share price (see examples in Cauchie et al., 2002; Gunsel and Cukur, 2007; Puah and Jayaraman, 2007; Tsoukalas, 2003).

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<sup>3</sup> Cited in Bilson et al. (1999)



Gupta et al. (2000) posit that the stock market indices are often used because of its value as an indicator to gauge the health of the economy. Stock market index consist of prices and capitalization of selected shares in the market. For example, Kuala Lumpur Composite Index (KLCI) uses the price and market capitalization of 100 companies. The components of KLCI include 14 G-20 companies (see Appendix 2).

Selection of counters in the KLCI follows established selection criteria such as minimum paid up capital and significant contribution to the economy (Mahmood and Zain, 2007). The composition in the index may be changed from time to time. Some counters may be removed from the list and others will take its place as replacement.

Some indices for example include other exchanges as well. The Dow Jones Wilshire 5000 Total Stock market Index include nearly all publicly traded companies in the U.S. market such as New York Stock Exchange, NASDAQ and American Stock Exchange (Wikipedia, 2008a).

The studies on share prices are well documented especially on the developed market of USA, Japan and Europe include those by Chen et al. (1986), Chen (1991), Clare and Thomas (1994), Mukherjee and Naka (1995), Gjerde and Saettem (1999) and Flannery and Protopapadakis (2002).<sup>4</sup>

In a pioneer study, Chen et al. (1986) found that industrial production, risk premium of corporate bond and unanticipated inflation to have significant exploratory power.

Looking at more recent studies in this area, Maysami et al. (2004) examined the cointegration of macroeconomic variables and included Singapore's stock market's sector

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<sup>4</sup> Cited in Kandir (2008)

indices such as property, finance and hotel instead of the composite index. For the macroeconomic variables, they had chosen short and long term interest rates, industrial production, price levels and money supply. They found that the stock market index and property index showed cointegration relationship with the changes of the macroeconomic variables.

Ratanapakorn and Sharma (2007) investigated the short and long term relationship between US S & P 500 and six macroeconomic variables of short and long term interest rate, money supply, industrial production, inflation and exchange rate and found that all macroeconomic variables causes the share price in the long run but not necessary in the short run.

Studies on developed markets showed that the markets and the macroeconomic variables are cointegrated suggesting that they are efficient. The same cannot be said of emerging market. Various studies on emerging stock market were conducted with mixed results indicating that these markets have differing degree of efficiency.

Tsoukalas (2003) studied the relationship between share price and industrial production, exchange rate, money supply and price level in Cyprus. His findings found strong evidence of the relationship which implied the inefficiencies of the stock market.

Jiranyakul and Brahmasrene (2005) study of the Thailand context before and after the Asian Financial Crisis found mixed results. They investigated industrial production index, money supply, inflation, exchange rate, interest rate and oil price. In both period of studies, they found that only money supply to be cointegrated with the share price and causes the share price to change in the same direction.

Bhattacharya and Mukherjee (2002) studied the causal relation due to Toda-Yamamoto between BSE Sensitive Index price and macroeconomic variables of exchange rate, foreign reserve and value of trade balance in the foreign sector in India. They, however, found no causal relation between these variables and the stock index suggesting that the index has incorporated all information on the variables being studied.

Puah and Jayaraman (2007) studied interest rate, real output, money supply (M2) and exchange rate in Fiji and found that in the short run, interest rate did not cause changes in share price. In the long run, all macroeconomic variables affect share price.

Abdelaziz et al. (2008) studied the linkages between share price with exchange rate and oil price in four Middle East countries namely Egypt, Kuwait, Oman and Saudi Arabia. In their case, they found that in all these countries, only oil price emerge as the dominant factor in the relationship.

## **2.4 Empirical review - Malaysia**

There are quite a number of studies examining the share prices in the Malaysian context. In these studies the market index of KLCI or Second Board Index are often taken to represent share price. Economic factors such as money supply, inflation, interest rate, exchange rate and output are some examples of the economic factors tested against share prices. The results from the Malaysian context appear mixed.

For example, Habibullah and Baharumshah (1996) found that output and money supply cannot predict share prices in Malaysia<sup>5</sup> while Ibrahim and Yusoff (2001) found that growth in money supply affect the share price positively.

Ibrahim and Yusoff (2001) analyzed real output, price level, and money supply and exchange rate against the KLCI Index representing share prices in the Malaysian context. They found that price level and money supply impact the share price differently. For example, money supply is positive in the short run but negative in the long run. Price level however, gave negative impact to the share price in both time horizons. Their study showed predictability of share price due to changes of macroeconomic variables.

Further, a study by Ibrahim and Aziz (2003) also supported that share prices in Malaysia may be predicted especially in the long run. The authors used monthly data from 1997 to 1998 and employed the cointegration and vector autoregression to examine the causal relationship and dynamic linkages of the Malaysian stock market and four macroeconomic variables (industrial production, money supply, price level and exchange rate between the Malaysian ringgit and US dollar). They found that in the long run, industrial production and price level are positively related to the share price while money supply and exchange rate negative. In the short run industrial production, price level exchange rate showed similarly relationship as in the long run. However, money supply association with the share price was positive in the short run but negative in the long run.

Similar studies but in a different time frame was conducted by Islam (2003). The author examined interest rate, inflation rate, exchange rate and industrial productivity and their short run

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<sup>5</sup> Cited in Tsoukalas (2003)

dynamic adjustments and long run equilibrium relationship with Kuala Lumpur Composite Index using monthly data from January 1990 and June 2002. Results reveal that all macroeconomic variables analyzed were found to have long run cointegration with share price.

Yu (2005) studied the relationship of Production, GNP, Industrial Production; inflation, CPI, money supply (M1), interest rate and exchange. Share price was proxy by KLCI. Using data from 1977 to 2004 and tested the relationship in different period groups and found mixed results. For example, only interest rate (T-Bill) was found to have consistent relation with share price in all time frames and that KLCI causes changes in interest rate and not the other way around.

Cheah et al. (2006) examined causal relationship between stock prices and derivative products and test whether markets influence each other. The result showed that the relationship was relatively weak but evidences showed the existence of leverage effect in the stock market.

Azman et al. (2006) examined causal relation between share price and exchange rate and found that the variables had bi-directional relationship but the relationship was uni-directional during the Asian Financial Crisis period, i.e. exchange rate lead stock price.

Phang (2006) selected GDP, price level, money supply (M1 and M2), Industrial Production Index and government budget deficit against the KLCI and Second Board index. Using data from 1991-2004, he found evidence of cointegration between macroeconomic variables and share price. The author's noted that his findings supported earlier findings of Habibullah (1998), Ibrahim (1999) and Ibrahim and Aziz (2003). His analysis reveal that GDP and M2 have positive relationship to share price while CPI, IPI, M1 negative.

Chong and Goh (2005) using data from 1987 to 2001, examined the variability of share price during periods before and after the implementation of capital controls. Before the controls

both money supply and interest rate were found to have long-run cointegration with share price but after the capital control was implemented, only interest rate remain to be leading the economic activities.

Low and Ghazali (2007) examined the short and long run interaction between share price (KLCI) and Malaysian unit trust funds performance. They found that, in the long run, unit trust fund price performance differ significantly from the share price. They also found that two unit trust funds are not cointegrated with the price of shares. This is interesting given unit trust funds hold shares in their portfolio and yet the prices did not reflect changes from the share prices and fail to move in tandem with the share market.

The above literatures show that with few exceptions and influence by the certain effects of the monetary policy, changes in macroeconomic variables may be used to predict share prices. We find few studies on Malaysian GLCs and none of these examined GLCs share price performance. So far, studies on GLCs examined the performance from the perspective of accounting measure; market based measure and shareholding characteristics and compared these against those of non-GLCs.

For example, Ismail (2007) compared the Economic Value Add between the two types of companies. The study found that GLCs in general tend to register lower EVA scores than non-GLC companies.

Ahmad (2006) studied three measures of profitability, productivity and output and compared these with the performance of non-GLC companies to find whether there is significance difference between the two groups. Using data from 1996-2006, she found that in terms of profitability and productivity, non-GLC performed better than GLCs. However, the

study found that GLC performed better than non-GLC in terms of output (sales). This may be explained by the size of GLC companies which are usually large in size thus, higher output.

Razak et al. (2008) examined Government ownership in GLC and firm's characteristics of corporate governance, agency cost, growth, risk and profitability its impact on the performance of the company and made comparison with non-GLC companies. They found that GLCs generally performed better on accounting measure (ROA, sales, profit margin) compared with non-GLCs while non GLCs mostly perform better in market based performance (Tobin Q, asset to equity). However, the results showed that GLCs shows continuous improvements in their performance. Further, they found that there is no significance when comparing ROE and P/E between the two. Overall, the authors concluded that government ownership (interference and monitoring) helps GLCs to perform better.

Government shareholding in companies was found to be a positive factor in a company's performance as shown by the findings of Razak et al. (2008). But GLCs have been subjected to criticism due to this fact. An observation by Ramirez and Tan (2003) in the case of Singapore is quite relevant in the case of Malaysian GLCs. For example, if a GLC is performing well, it is because they have unfair advantage in business opportunities especially in dealing with Government's projects. Accusations that GLCs have been directly awarded projects without tenders and received favorable terms in funding are common. However, if a GLC is not performing well, then, it would be faulted for not having professional managers but politically motivated appointments.

## **2.5 Gaps in the literatures**

From the literature review, we did not find studies on the relationship of macroeconomic variables and share price of GLC companies in the Malaysian context. Many studies used the benchmark KLCI, Second Board Index and unit trust funds to represent share price. Such studies include Ibrahim and Yusoff (2001), Ibrahim and Aziz (2003), Yu (2005), Phang (2006) and Low and Ghazali (2007).

We did not find any studies to show the linkages between GLC share prices and the macroeconomic factors. Considering the significance of GLC participation in the Malaysian capital market and their contribution to the Malaysian economy, we take this opportunity to fill this gap in the literatures.

## **2.6 Development of hypotheses**

In this section, we present the justifications in arriving in the hypotheses with regard to the selected macroeconomic variables; real output (Industrial Production Index), price level (Consumer Price Index), interest rate (Base Lending Rate) and money supply (M3).

The above variables have been frequently used as references to the level and health of economic activity. The relationship between these macroeconomic variables and their role on the changes of asset prices has been the subject documented in numerous articles, many of which are discussed in this paper. In this present study, we attempt to examine the influence of these variables to the changes of G-20 share prices. Another consideration for the employment of these macroeconomic variables is the availability of data during the period under study.