PROSIDING PERKEM VIII, JILID 2 (2013) 1011 - 1021
ISSN: 2231-962X

Examining the Co-Integration and Causal Relationship Analysis between Fiscal Policy and Financial Market in Malaysia

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ABSTRACT

The objective of the current paper is to analyze the relationship between stock index and macroeconomic policies (fiscal and monetary) using quarterly data for the (1999:Q1–2011:Q3) period. The change in stock index was used as a proxy for financial market performance. This study employed Engle-Granger model to detect the existence of long-run relationship and develops a vector error correction model (VECM) to test the existence and direction of causality among variables. The empirical findings indicate that there exists long-run relationship among stock index, fiscal and monetary tools. The granger causality results show that interest rate is the causal of financial performance in the short-run and long-run. On the other hand, the direction of causality runs from taxes, government expenditure and M2 to financial performance in the long run. This result indicates that fiscal and monetary tools play an important role in accelerating financial performance in Malaysia. However, monetary tools can work faster compared to fiscal tools. This finding would give a signal to the investors to strategize their investment decision in the short and long run.

Keywords: Fiscal policy, Stock Market, Co-integration, Granger Causality, Malaysia.

INTRODUCTION

The stock market is often considered as a primary indicator of a country's economic strength and development. The positive change in stock index indicates the positive performance of financial market (Bakhet and Othman, 2012). On the other hand, the negative change in stock index indicates bad reputation of a country's financial market. For instance, the good financial reputation reflects that Malaysia is an attractive destination for Multinational Corporation (MNCs) and Domestic Corporation for investment. Likewise, higher investment reflects higher GDP growth, which is in line with the target of 10th Malaysia Plan to achieve GDP growth at 6 percent per year.

It is well recognized that there is a closer relationship between performance of financial market and economic growth (Baharumshah, *et al*., 2002; Wongbangpo, *et al*., 2002; and Silvia and Iqbal, 2011). Meanwhile other researchers confirm that anything happening to financial market will also affect the variation in economic activities, demand for real money, interest rate and subsequently, the value of domestic currency (Ibrahim and Wan Yusoff, 2001).

Since the awareness on the aforementioned topic is increasingly popular, there is a large number of exploratory studies on factors and function of stock market(See, for example,Maysami *et al.*, 2000; Kim, 2003; Lean, 2003) and also those listed inTable 1. However, existing studies only analyzed the relationship between stock market with exchange rate, interest rate, money supply, inflation, industrial production and CPI [see table 1] and very little study was focusing onthe linkages between stock market and fiscal tools. At the time we were preparing this paper, only Afonso *et al.*, (2011); Laopodis, (2009); Arin *et al*., (2009); and Bekhet & Othman, (2012), explore the link between stock market and fiscal's tools.Nevertheless, almost all of these studies were focusing on developed countries that do not represent Malaysia. Afonso, *et al*. (2011) ascertained the linkages between fiscal tools and asset market in UK. Bekhet and Othman (2012) filled up the linkages by analyzing stock market and fiscal tools and they found a long run relationship between stock index and fiscal tools in Malaysia. However, they did not explore the direction of causal relationship among variables. In retrospect, the

function of stock market poses an interesting empirical research question on causal direction between fiscal tools and stock market performance. Also, to answer the question that which macroeconomic policies play a vital role in determining stock market performance in Malaysia. All of these questions need further clarification this is because the empirical evidence could serve as a tool and asset to policy maker in drafting their policy. Furthermore, the combination of a strong financial system and solid fiscal policy is necessary to promote economic growth (Taha *et al*., 2013).

Therefore, this paper a ims to examine the causal relationship between performance of the stock market and fiscal policy for the (1999: 1–2011:Q3) period. The fiscal and monetary tools are employed in this study. The inclusion of the fiscal tools, in the analysis, is motivated by the fact that Malaysia is a mixed economy. In a mixed economy system, private sector and the public or government sector plays a vital role in making a decision for the success and development of a country. Monetary tools also are applied in order to compare the level of intensity of Malaysia's stock market towards the changes in fiscal and monetary variables. Additionally, this study attempts to re-examine the co-integration relationship among the performance of the stock market, monetary, and fiscal tools. The findings of this study could help us to understand the role of macroeconomic policy in determining the stock market performance. Also, this study is useful in drawing economic policy implication for Malaysia and helping investors to proactively strategize their investment decision

The rest of the paper is structured as follows: Section 2 presents the background of fiscal policy in Malaysia. Section 3 reviews the past literature. Section 4 defines data sources and variables. Section 5 describes the methodology of the study. Section 6 analyses the results. And finally, section 7 discusses the conclusion and policy implications.

FISCAL POLICY IN MALAYSIA

In recent years, people have become aware of fiscal policy and its impact on other macroeconomic indicators and performance. By practicing the fiscal policy, the government decides how much to spend, what to spend, what to spend for and how to finance its spending (Abel et al., 2011). Hubbard and O'Brien (2010) defined fiscal policy as a change in federal taxes and purchases that are intended to achieve macroeconomics policy objectives. Basically, federal government expenditure in Malaysia was allocated for 2 major purposes namely, operation purposes and development purposes. The rationale for allocating the budget for operation purposes is to upgrade and improve productivity as well as to impede long term economic growth potential. The largest components of operating expenditure are emoluments, subsidies, supplies and services. The factor contributing to higher allocation for emoluments is the accommodation of the improved scheme of service for the police as well as the amendment to the salary scheme of medical and dental lecturers in public higher education institutions (Ministry of Finance, 2010-2011). Subsidies is second top operation expenditure. Its trend has increased over the years starting from 2006 onwards and the impact is closely linked to the world commodity prices, particularly oil (Ministry of Finance, 2010/2011). The reason for improving subsidies is to reduce the burden of society especially to the poor and disadvantaged group.

On the other hand, the rationale for allocating the budget for development purposes is to upgrade rural basic infrastructure, urban transport, low income household and other social services. These expenditure purposes have a significant role in sustaining growth momentum and positive economic transformation. The changes in the stock market also could influence the variations in economic activities and the pattern of government expenditures. The government development expenditure would create Malaysia as an attractive destination for investment. Figure 1 shows the growth rate of government operating and development expenditure for the (1980-2011) period. The government development expenditure growth is faster than the operating expenditure which is 7.1percent compared to 8.5 percent for development expenditure.

The main source of federal government revenue is the tax collection and non-tax revenue to finance its expenditures and to improve growth prospect of the country as well. There are several types of tax and non-tax revenues such as service tax, sales tax, excise tax, export duties, import duties, income tax and non-tax revenue (license, permit and investment income). The income tax is the major tax revenue in Malaysia (Ministry of Finance, 2010-2011). The increased in stock price make domestic financial asset attractive and this could increase the country financial credibility. Furthermore, this could increase confidence of foreign investors to invest in a country and consequently accelerates government tax revenue.

Malaysia has been experiencing a fiscal deficit over the years. In 2007, the deficit was recorded at RM23,764 million and it was increased to RM36,553 million and RM47,943 million in year 2008 and 2009 respectively [See figures1 & 2)]. Even though this amount was getting bigger

throughout the years, as compared to GDP growth, it was reported at 7 percent of GDP in 2009 and was decreasing to 5.6 percent in 2010 (Bernama, May 13, 2010). This figure indicates that the growth of Malaysia's economic is relatively faster that the growth of fiscal deficit. As consequences of government injection, the aggregate demand, government capital formation and labour incentive are affected and finally in the long run it would stimulate economic growth. In this paper, we are going to investigate the role of fiscal policy (government expenditure and revenue) towards the performance of economic activities and financial performance and then to compare their contribution to monetary policy.

LITERATURE REVIEW

A large amount of empirical studies documented the relationship between stock market and macroeconomics variables, such as exchange rate, industrial production, money supply, inflation and interest rate. In line with the objectives of this paper, the review of the past studies will be divided into 2 divisions. The first division highlights the co-integration relationship and the second division discusses the causal relationship. Also, in this literature review containa summary of the studies by previous researchers from year 2000 and onwards.

Co-integration relationship

Many studies have endeavoured the existence of co-integrating relationship between stock market and interest rate (For example, Maysami *et al*., 200; Wongbanggpo et al., 2002; Kim, 2003; Baharumshah *et al*., 2002; Rahman *et al*., 2009). All these studies also found the co-integration relationship between the aforementioned variables and confirmed the consistent relationship between stock market and interest rate.

Theoretically, interest rate and money is likely to affect stock market index. In this regard, many studies show that money supply has a dynamic effect on stock market index (For example, see Maysami *et al*., 2000; Ibrahim & Wan Yusoff, 2001; Rahman *et al*., 2009; Hosseini *et al*., 2011). Most of them report a long run relationship between stock market index and money supply. In the case of the impact of industrial production, Kim (2003) investigated the relationship between stock market and industrial production. He validates that stock price is positively related to industrial production. This result is consistent with Rahman *et al*. (2009) and Hosseini *et al*. (2011). However, Filis (2010) showed that there was no relationship between industrial production and stock market. Additionally, Maysami *et al*. (2000) and Laopodis (2009) have also shown the insignificant results.

Other studies explored the relationship between stock market and exchange rate (Such as, Lean *et al*., 2003; Kim, 2003; Pan *et al*., 2007; Rahman *et al*., 2009). Furthermore, these findings have shown that there is no consensus relationship between them. For USA data, Kim (2003) tracked down that stock price is negatively related to exchange rate. But for different location (major Asian countries), Lean *et al*., (2003) viewed no co-integration relationship between stock price and exchange rate except for the Philippine and Malaysia and it is only happening before financial crisis. Using data after the financial crisis, Lean *et al*. (2003) unearthed relationship between stock price and exchange rate in Korea, while other Asian countries show insignificant results. However, using data at a different time frame for the(1988-1998) period, Pan *et al*. (2007) noticed that there was a relationship between the same variables for Hong Kong, Japan and Thailand before and during financial crisis.

Besides, the aforementioned variables, there are more macroeconomic variables that have been tested by previous researchers such as CPI (inflation), GDP and oil price. Kim (2003) and Filis (2010) indicated a long run relationship between CPI and stock market index. On the other hand, Filis (2010) and Hosseini *et al*. (2010) revealed that oil price has a relationship with stock market index.

Causality relationship

Aside from the empirical investigation on co-integration relationship, the direction of causality also is a vital aspect to strategize a solid strategy for each country. Wongbangpo, et al. (2002) analyzed the causal relationship between macroeconomics variables (GNP, CPI, Money supply, nominal interest rate and exchange rate) and stock price in ASEAN countries. The result revealed the causal relationship running from macroeconomics variables to stock price in all 5 ASEAN countries.

In another study, Pan, *et al*. (2007) analyzed the causal relationship between stock price and exchange rate. They divided the analysis into 2 phases. The first phase was before financial crisis and the second phase was during the financial crisis. The study indicated that there was not much difference

in terms of their finding(s) before and during the crisis. However, they found the causal relationship from exchange rate to stock price for Hong Kong, Japan, Malaysia and Thailand. During the crisis other countries remained in the same direction of causality, while Malaysia did not show any direction of causality.

Then, Rahman *et al*. (2009) examined the causal relationship between stock market and macroeconomics variables such as industrial production, reserve, real exchange rate, M2 and interest rate for Malaysia. Their findings showed that stock market granger is thecausal reserve and interest rate in bidirectional manner whilst industrial production, exchange rate and M2 have unidirectional linkage with stock market. Furthermore, Gregoriou and Kontinikas (2010) analyzed the relationship between stock price and goods price for 16 OECD countries for the 1970-2006 periods. They revealed the long run causality running from stock price to good price.

Almost all of the previous studies put their attention on the relationship between stock market and macroeconomics variables. But, Arin *et al*. (2009), Afonso *et al*. (2011), Silvia and Iqbal (2011) investigated the function of fiscal tools to the stock market and they confirmed that there is a relationship between the aforementioned variables. Afonso, *et al*. (2011) ascertained the linkages between fiscal tools and asset market in the UK. Bekhet and Othman (2012) filled up the linkages by analyzing stock market and fiscal tools in Malaysia and they found a long run relationship between stock index and fiscal tools. However, Bekhet and Othman (2012) did not explore the direction of causal relationship among variables which now becomes the motive of this research.

Based on the previous findings, this study hypothesizes that there is a co-integration relationship amongst fiscal tools, monetary tools and stock market performance and also, the existence of causal direction from fiscal tools to stock market performance.

DATA SOURCES AND TRANSFORMATION

In the current paper, data of Stock index (S), government operating expenditure (GO), government development expenditure (GD), tax revenue (T), interest rate (r) and money supply (M) are employed. The sources of these data are the Department of Statistics (DOS), World Bank and Yahoo Finance@ Bursa Malaysia. The purpose of combining these 4 sources is to ensure the consistency of this timeseries. The time series in this study is a quarterly data ranging from 1999(Q1) to 2011(Q4) period and this will make the total observations equal to 51.

Stock index (S) is the dependent variable which is applied to measure the financial performance in Malaysia. This data was obtained from Yahoo finance and measured in Ringgit Malaysia (RM). Since the original data was in monthly basis, it was transformed into quarterly form in order to ensure consistency with other timeseries data.These data were in constant value, where the year 2000 was used as a base year. Likewise the monetary variables were obtained from DOS and measured in percentage. Money supply was extracted from M2 and measured in RM millions. All variables are presented in logarith forms because this helps to induce stationarity (Narayan & Smyth, 2005) and to obtain elasticities (Hill, *et al*., 2008). Below are the definitions of variables in this study.

LS = *log stock index indicating the growth rate of stock index.*
LG = *log government expenditure indicating growth rate of government expenditure.*
(Goverment expenditure =operating expenditure + development expenditure)
LT = *log tax revenue indicating growth rate of tax revenue.*
LM = *log M2 indicating growth rate of money supply.*
Lr = *log interest rate indicating growth rate of interest rate.*

To ensure that the analysis works pretty well, the first step is to make sure that the data are normally distributed. The normal distribution is symmetric (skewness=0) and has a bell shape with a peakedness and tail thickners leading to a kurtosis of 3 (Hill *et al*., 2008). Table 3 shows the desriptive statistics of the data.

In light of the results of the SK and KS coefficients, it shows that we have failed to reject the H_o for normality. The result indicates that most of the variables are almost normally distributed. This is due to the skewness coefficient that is close to 0, and the kurtosis result that is close to 3. However, even though the data are not absolutely normal, the test still can work pretty well if the observation is sufficiently large.

METHODOLOGY

Theoretically, both Keynesian and neoclassical economists provided varieties of policies and tools of government intervention, which are broadly grouped into fiscal and monetary (Usman *et al*., 2011). The choice of a policy or tools depends on how relatively effective it is, in achieving the set of macroeconomic objectives based on theory and evidence. In practical, both policies were implemented to achieve sustainable economic growth. On one hand, monetary tools (r and M) can spur economic growth by providing incentive for saving to ensure a large pool of investment fund that is needed to sustain growth (Hubbard & O' Brien, 2011). By using the expansionary monetary policy, increasing the M and decreasing the T are expected to increase GDP. In other words, there is a negative correlation between r and GDP; and positive correlation between M and GDP.On the other hand, fiscal tools can spur economic growth by increasing government expenditure or cutting taxes. This means that there is a negative correlation between T and GDP; and positive correlation between government expenditures (GO and GD) and GDP.

Meanwhile, previous researchers found a relationship between financial performance and economic growth (Baharumshah *et al*., 2002; Wongbangpo *et al*., 2002; Silvia & Iqbal, 2011). In conjunction with the above scenario, we investigate the role of fiscal and monetary tools in sustaining financial performance (stock index). Thus, in this paper stock index (S) can be expressed in general as a function of fiscal tools (GO, GD and T) and monetary tools (M and r). Also, stock index (S) is the dependent variable and the rest are the independent variables. The function of stock index (S) can be expressed in Equation 1.

$$S_t = f(G_t, T_t M_t, r_t) \qquad \text{[Equation 1]}$$

In order to achieve the objective of the study, an appropriate technique or the impact of study has to be chosen in order for it to be a futile exercise (Munir *et al*., 2011). The modeling strategy will be as following:

1. Unit root test: The first step of the analysis is to conduct a stationary test for each variable (after transforming each into logarithmic form). The stationary test is done by testing for unit root by using ADF and PP tests at level *I(0)* [see equation 2].

   $$y_t = \emptyset y_{t-1} + \varepsilon_t \qquad \text{[Equation 2]}$$

   y_t represents each time series and it will be run individually. The time series is not stationary if it contains unit root @ $\emptyset = 1$. However, if $\emptyset \neq 1$, the data is stationary. If the data is not stationary, we have to proceed with stationary test at first difference *I(1)*. If the data is not stationary at first, we will proceed to test stationary at second difference. Usually, the macroeconomics data will achieve stationary at first difference or second difference (Nelson & Plosser, 1982; Tang, 2008; Bekhet & Othman, 2011).

2. Developing the double log model: Generally, to analyze the connection between dependent and independent variables, to assess sensitivity (elasticity), we adopt a double log model. The double log model is also known as constant elasticity model. This can be done only if all value of dependent and independent variables are in positive value (Hill *et al*., 2008) [see Equation 3].

   $$\log S_t = \beta_0 + \beta_1 \log G_t - \beta_2 \log T_t + \beta_3 \log M_t - \beta_4 \log r_t + U_t \qquad \text{[Equation 3]}$$

   $$\Delta U_t = \rho U_{t-1} + \varepsilon_t$$

   $\beta_1, \beta_2, \beta_3$ and β_4, represent the level of sensitivity of stock index towards the changes in independent variables. The greater $\beta_1, \beta_2, \beta_3$ and β_4, indicates the higher sensitivity they are. β_2 and $\beta_4$have a negative value because we expect the tax and interest rate to have a negative relationship with financial performance (stock index). However, other variables have a positive relationship with financial performance (stock index). TheU_t is an error term. It represents a "storage bin" for unobservable or unimportant factor affecting the dependent variable (Hill*et al*., 2008).

3. Co-integration test: The co-integration can be captured by analyzing the stationarity of the residual calculated by the sub-equation 3. If the residual is stationary, this indicates that there is long run equilibrium among variables (Vogelvang, 2005) and all the variables are accepted by macroeconomics theory to analyze the sensitivity of the stock index. If the variables are not co-integrated at level we ought to test for co-integration at first and then second difference until they are co-integrated. The decision whether to reject or not depends on the value of ADF statistic for residual. If this value is smaller than the critical value of ADF we have to reject the H_0 which means that there is no co-integration (Hamilton, 1994; Fuller, 1976; Volgelvang, 2005). This procedure is crucial because the sensitivity is valid only if the variables have the same order of integration. ADF and P.P tests for co-integration are used to investigate the degree of integration.

4. The previous procedures (Unit root test and co-integration test) are a vital process in determining which model (VAR, VECM, and ARDL) is suitable to assess direction of causality among the variables. There are 3 possible outcomes: first outcome is the variables are stationary but not co-integrated, second outcome is the variables are stationary and co-integrated, and finally, the variables are stationary at different level and co-integrated but the sample is not large enough. For the first option, we will use VAR model (unrestricted VAR), for the second option, we will apply VECM (restricted VAR) [Jobert & Karanfil, 2007] and for the third option, we will employ ARDL model. However, if some variables are not stationary, we may use ARDL as well (Halicioglu, 2011).

Assuming that all variables are co-integrated, therefore we will use VECM to identify the nature of the long run equilibrium relationship using the 2 step procedure of Engle and Granger (1987). In the first step, we estimate the long run model for equation 3 in order to obtain the estimated error [see equation 3, after this we call it ect]. In the second step, we estimate granger causality model with ect as below [see equation 4-8]:

$$\Delta lS_t = \propto_0 + \sum_{i=1} \propto_1 \Delta lS_{t-i} + \sum_{i=1} \propto_2 \Delta lG_{t-i} + \sum_{i=1} \propto_3 \Delta lT_{t-i} + \sum_{i=1} \propto_4 \Delta lM_{t-i} + \sum_{i=1} \propto_5 \Delta lr_{t-i} + \propto_6 ect_{t-1} \quad [4]$$

$$\Delta lG_t = \mu_0 + \sum_{i=1} \mu_1 \Delta lG_{t-i} + \sum_{i=1} \mu_2 \Delta lS_{t-i} + \sum_{i=1} \mu_3 \Delta lT_{t-i} + \sum_{i=1} \mu_4 \Delta lM_{t-i} + \sum_{i=1} \mu_5 \Delta lr_{t-i} + \mu_6 ect_{t-1} \quad [5]$$

$$\Delta lT_t = \beta_0 + \sum_{i=1} \beta_1 \Delta lT_{t-i} + \sum_{i=1} \beta_2 \Delta lG_{t-i} + \sum_{i=1} \beta_3 \Delta lS_{t-i} + \sum_{i=1} \beta_4 \Delta lM_{t-i} + \sum_{i=1} \beta_5 \Delta lr_{t-i} + \beta_6 ect_{t-1} \quad [6]$$

$$\Delta lM_t = \varphi_0 + \sum_{i=1} \varphi_1 \Delta lM_{t-i} + \sum_{i=1} \varphi_2 \Delta lG_{t-i} + \sum_{i=1} \varphi_3 \Delta lT_{t-i} + \sum_{i=1} \varphi_4 \Delta lS_{t-i} + \sum_{i=1} \varphi_5 \Delta lr_{t-i} + \varphi_6 ect_{t-1} \quad [7]$$

$$\Delta lr_t = \theta_0 + \sum_{i=1} \theta_1 \Delta lr_{t-i} + \sum_{i=1} \theta_2 \Delta lG_{t-i} + \sum_{i=1} \theta_3 \Delta lT_{t-i} + \sum_{i=1} \theta_4 \Delta lM_{t-i} + \sum_{i=1} \theta_5 \Delta lS_{t-i} + \theta_6 ect_{t-1} \quad [8]$$

Where $\mathrm{lS}, \mathrm{lG}, \mathrm{lT}, \mathrm{lM}, \mathrm{lr}$ and ect represent the natural log of stock index, government expenditure, tax, money supply, interest rate, and error correction terms respectively. The VECM enables us to estimate the long run and short run Granger causality. The coefficient $\alpha_i, \mu_i, \beta_i, \varphi_i$ and θ_i (i=1,….,5) indicate the short run causality if the value is not equal to zero. However, if these coefficients are equal to zero, this will indicate that there is no short run causality among respective variables. Furthermore the coefficients $\alpha_6, \mu_6, \beta_6, \varphi_6$ and θ_6 indicate the long run relationship if the coefficient is not equal to zero and vice versa. These causal conditions among above variables can be summarized as shown in Table 3.

RESULTS ANALYSIS

Stationarity and Co-integration test

Before conducting the co-integration and granger causality test, it is important to determine the stability of the time series data using ADF and PP tests. The results affirmed that all variables (stock index, government expenditures, taxes, money supply and interest rate) contain a unit root and were found to be non-stationary at level, *I(0)*. However, after the first different, Δ, all variables were found to be stationary at 5 percent (see table 4). Therefore, it can concluded that they are stationary at first different and these results are in line with earlier studies (Bekhet and Othman, 2011).

According to Engle and Granger (1987), if all variables are stationary, Equation 3 can be estimated using OLS (See Equation 9).However, if the resultsof the residual are stationary at level *I(0)* then all variables used are co-integrated. Through co-integration test, we found the existence of long run relationship among variables. Furthermore, this result is consistent with the hypothesis and earlier findings (Maysami *et al*., 2000; Kim, 2003; Rahman, *et al*., 2009; Wongbanggpo *et al*., 2002; Baharumshah *et al*., 2002). Table 5 confirmed that the variables of this study are co-integrated.

$LS_t =$	-1.13	$-0.11LG_t$	$+0.09LT_t$	$+0.63LM_t$	$-0.10Lr_t$	$+ U$	
Prob =	*(0.51)*	*(0.39)*	*(0.64)*	*(0.00)*	*(0.72)*		
$R^2 =$	*0.77*						
F Stat =	*39.53*	*(0.00)*					
D/W =	*0.80*						[Equation 9]

Granger Causality

In order to detect the direction of causality between the variables, we apply the VECM. This model enables us to detect the short run and long run causality at the same time. Equation 10 -14 reports the results of the granger causality test.

$\Delta LS_t =$	0.04	$+0.02\Delta LS_{t-1}$	$+0.06\Delta LG_{t-1}$	$-0.05\Delta LT_{t-1}$	$-0.04\Delta LM_{t-1}$	$+1.43\Delta Lr_{t-1}$	$-0.45ect_{t-1}$	
Prob =	*(0.24)*	*(0.92)*	*(0.46)*	*(0.68)*	*(0.97)*	*(0.047)*	*(0.00)*	
$R^2 =$	*0.28 ,*							
F Stat =	*2.68*	*(0.03)*						
D/W =	*1.94*							*[Equation 10]*
$\Delta LG_t =$	0.23	$+0.36\Delta LG_{t-1}$	$-0.25\Delta LS_{t-1}$	$-1.17\Delta LT_{t-1}$	$-6.54\Delta LM_{t-1}$	$-0.21\Delta Lr_{t-1}$	$-1.61ect_{t-1}$	
Prob =	*(0.00)*	*(0.15)*	*(0.45)*	*(0.00)*	*(0.00)*	*(0.90)*	*(0.00)*	
$R^2 =$	*0.62*							
F Stat =	*11.65*	*(0.00)*						
D/W =	*2.07*							*[Equation 11]*
$\Delta LT_t =$	0.14	$0.14\Delta LT_{t-1}$	$-0.34\Delta LG_{t-1}$	$-0.49\Delta LS_{t-1}$	$-2.99\Delta LM_{t-1}$	$+0.88\Delta Lr_{t-1}$	$-0.44ect_{t-1}$	
Prob =	*(0.01)*	*(0.61)*	*(0.04)*	*(0.04)*	*(0.045)*	*(0.45)*	*(0.25)*	
$R^2 =$	*0.56*							
F Stat =	*8.98*	*(0.00)*						
D/W =	*2.35*							*[Equation 12]*
$\Delta LM_t =$	0.02	$+0.26\Delta LM_{t-1}$	$+0.001\Delta LG_{t-1}$	$-0.008\Delta LT_{t-1}$	$-0.05\Delta LS_{t-1}$	$+0.09\Delta Lr_{t-1}$	$-0.02ect_{t-1}$	
Prob =	*(0.00)*	*(0.09)*	*(0.93)*	*(0.68)*	*(0.03)*	*(0.42)*	*(0.35)*	
$R^2 =$	*0.17*							
F Stat =	*1.48*	*(0.21)*						
D/W =	*2.00*							*[Equation 13]*
$\Delta Lr_t =$	-0.005	$+0.05\Delta Lr_{t-1}$	$+0.02\Delta LT_{t-1}$	$+0.02\Delta LM_{t-1}$	$+0.01\Delta LS_{t-1}$	$-0.006\Delta LG_{t-1}$	$-0.081ect_{t-1}$	
Prob =	*(0.24)*	*(0.00)*	*(0.31)*	*(0.91)*	*(0.66)*	*(0.63)*	*(0.04)*	
$R^2 =$	*0.43*							

F Stat =	*5.33*	*(0.00)*	
D/W =	*1.99*		*[Equation 14]*

The results of these tests indicate that the short run granger causality is running from interest rate to stock price, stock price to money supply and tax. These results were inconsistent with Ibrahim and Wan Yusoff (2001) and this could due to different methodology and period of study. Moreover, in the long run we found bidirectional causality between government expenditure and stock index, as well as interest rate and stock index. Furthermore, there is also bidirectional causality from tax to stock index to stock index and from money supply to stock index. In terms of long run association, it was consistent with the earlier work (Ibrahim & Wan Yusoff, 2001).

Based on the results (Equations 10-14), we can conclude that the fiscal policy was able to influence the financial market better in the long run rather than the short run. Government expenditures and tax were able to influence stock market in the long run and there is no causality running from government and tax to stock index in the short run. As compared to monetary policy, the interest rate was able to influence financial market both in the short run and the long run. Interest rate was shown as a powerful tool to influence financial market in the short run and the long run, while money supply influenced stock market only in the long run.

CONCLUSION AND POLICY IMPLICATION

The current paper analyzes the causal relationship between stock market and macroeconomic policies (fiscal and monetary) using quarterly data for the (1999:Q1–2011:Q3) period. The change in stock index was used as a proxy for financial performance. This paper employed the co-integration tests to detect the existence of long run relationship and developed a vector error correction model (VECM) to test the existence and direction of causality among variables. The empirical findings indicate that there exists long run relationship among stock index, fiscal and monetary tools. The granger causality results show that interest rate is the causal the financial performance in the short run and the long run. On the other hand, the direction of causality is running from taxes, government expenditure and M2 to financial performance in the long run. This result indicates that fiscal and monetary tools play an important role in accelerating financial performance in Malaysia. However, monetary tools can work faster compared to fiscal tools. This finding would give a signal to the investors to strategize their investment decision in the short and long run. Since the current study considered fiscal tools at aggregate level, in the future study, we recommend to specifically explore which fiscal tools cause stock market response. This is because the strength of relationship might vary depending to the types of fiscal tools.

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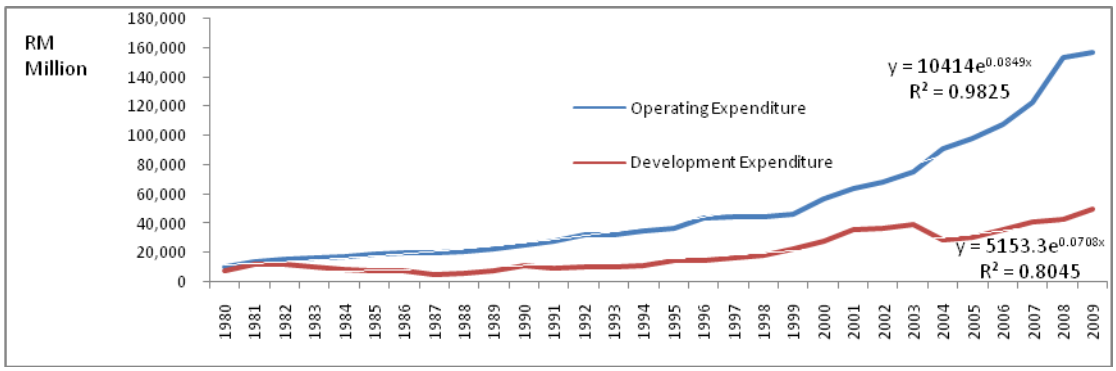
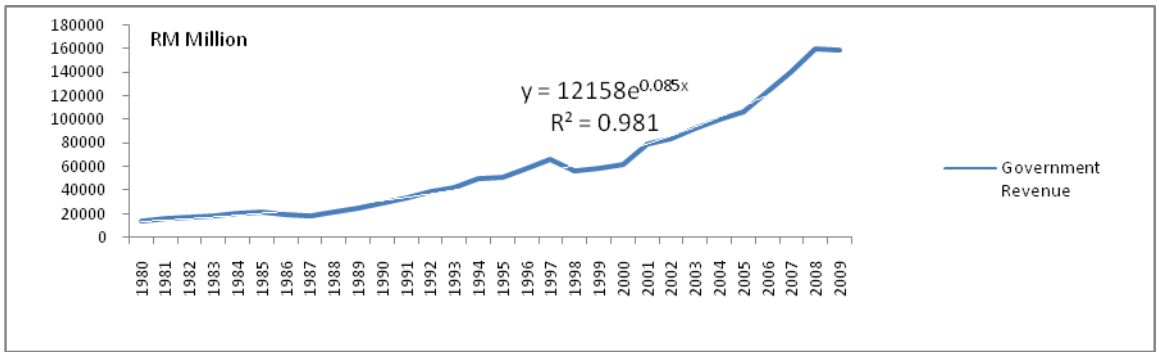
TABLE 1: The Variables used by the previous researchers.

Authors	The independence variables
Maysami *et al*. (2000)	Interest rate; inflation; money supply; domestic export; industrial production.
Kim, K H (2003)	Interest rate; inflation; industrial production; exchange rate.
Lean *et al*. (2003)	Exchange rate.
Pan *et al*. (2007)	Exchange rate.
Rahman *et al*. (2009)	Interest rate; money supply; industrial production; exchange rate.
Laopodis, N T (2009)	Money supply; industrial production; CPI; treasury note; AAA corporate bond; Federal government fund.
Khan *et al*. (2009)	Interest rate; exchange rate; CPI; trade balance.
Bae, Y (2010)	GDP; Demographic structure.
Filis (2010)	Industrial production; CPI; oil price (crude).
Gregoriou *et al*. (2010)	Good price.
Hosseini *et a*l. (2011)	Inflation; money supply; industrial production; oil price (crude).
Afonso *et al*. (2011)	GDP; Government revenue; unemployment rate; housing price.



Source: *www.epu.gov.my (Ministry of Finance, Accountant General Department, Bank Negara Malaysia)*

FIGURE 1: Government expenditure (in RM million).



Source: *www.epu.gov.my (Ministry of Finance, Accountant General Department, Bank Negara Malaysia)*

FIGURE 2: Government revenue (in RM million).

TABLE 2: Descripitive statistics for the study variables.

	LS	LG	LT	Lr	LM
Mean	6.83	10.36	10.18	1.84	13.26
Median	6.80	10.35	10.18	1.83	13.29
Maximum	7.35	11.08	10.81	2.26	13.97
Minimum	5.89	9.22	9.32	1.59	12.62
Standard deviation	0.32	0.47	0.41	0.16	0.44

Skewness (SK)	-0.39	-0.33	-0.24	0.31	0.09
Kurtosis (KS)	3.06	2.41	2.01	3.00	1.49
Jarque Bera	1.36	1.69	2.58	0.79	4.93
Probability	0.51	0.43	0.27	0.67	0.09
Observation	51	51	51	51	51

TABLE 3: Conditions for Causality Relationships.

Causal flow			**Condition**	
			Short run	Long run
Growth in Government expenditure	→	Financial performance	$\propto_2 \neq 0$	$\propto_6 \neq 0$
Financial performance	→	Growth in Government expenditure	$\mu_2 \neq 0$	$\mu_6 \neq 0$
Financial performance	→	Growth in tax revenue	$\beta_3 \neq 0$	$\beta_6 \neq 0$
Growth in tax revenue	→	Financial performance	$\propto_3 \neq 0$	$\propto_6 \neq 0$
Financial performance	→	Growth in money supply	$\varphi_4 \neq 0$	$\varphi_6 \neq 0$
Growth in money supply	→	Financial performance	$\propto_4 \neq 0$	$\propto_6 \neq 0$
Financial performance	→	Growth in interest rate	$\theta_5 \neq 0$	$\theta_6 \neq 0$
Growth in interest rate	→	Financial performance	$\propto_5 \neq 0$	$\propto_6 \neq 0$

TABLE 4: Unit Root Test Results

Variables used	*ADF*		*P.P*	
	ADF statistic	*Critical Value*	*P.P statistic*	*Critical Value*
DLG	*-26.65*	*-2.93*	*-33.80*	*-2.92*
DLM	*-5.28*	*-2.92*	*-5.29*	*-2.92*
DLr	*-4.37*	*-2.92*	*-4.36*	*-2.92*
DLS	*-8.40*	*-2.92*	*-8.63*	*-2.92*
DLT	*-16.18*	*-2.92*	*-37.34*	*-2.92*

** All varibles are significant at 5 percent*
Source: Output of Eviews Package, Version 7.1.

TABLE 5: Co-integration Test.

Variable	*ADF statistic*	*Critical value at 5percent level*	*Decision*
Residual (ε)	*-3.49*	*-2.92*	*Reject H_0: No co-integration @ I(1)*

** Significant at 5 percent*
Source: Output of Eviews Package, Version 7.1.