

# Have Taxes Led Government Expenditure In Malaysia?

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## ABSTRACT

*Taxation became crucial economic tools to govern economics for any country, especially to developing countries like Malaysia. In other words, fund collected from taxation used by the government to provide facilities for its population and for the development of the nation. Other than that income tax is one of the surest way to make sure the government fund is available for spending. Government revenue has been classified to tax revenue, non tax revenue and non-revenue receipts. Basically, in Malaysia, tax revenues include both direct and indirect taxes. Therefore, the main objective of this study is empirically tests the role of direct and indirect taxes revenue on the government expenditure in Malaysia for the past 30 years by applying the Vector Autoregressive (VAR) modeling. In addition, the results of this paper also indicate a long-run relation effect of taxes revenue and government expenditure in order to harm the economic growth. Based on these findings, we highlight some of major issues that policymakers should consider for effective taxation policy formulation and implementation in line with the dynamic nature of the Malaysia economy.*

**Keywords:** Tax Revenue, Government Expenditure, Vector Autoregressive (VAR)

## INTRODUCTION

Taxation became crucial economic tools to govern economics for any country, especially to developing countries like Malaysia. With the rapid trend toward globalization and internationalization, the pattern of tax revenues and economic growth across countries has become a significant concern to economists. Recently, Malaysia has also performed well and shows the similar growth pattern in economy. Therefore, fund collected from taxation used by the government to provide facilities for its population and for the development of the nation. Other than that income tax is one of the surest way to make sure the Government fund is available for spending. Inland Revenue Board (IRB) has play their main role as an agent of Malaysian Government and to provide services in administering, assessing, collecting and enforcing payment of income tax and other revenue as may be agreed between the Government and the Board. For many years, the Inland Revenue Board (IRB) has presumed that its activities promote better tax collection starting from Official System (OAS) until Self Assessment System (SAS).

Government revenue has been classified to tax revenue, non tax revenue and non-revenue receipts. Tax revenues include both Direct and Indirect Taxes. Direct taxes are collected by the IRB which consists of income tax from individuals, companies, other persons and petroleum, stamp duty, estate duty and real property gains tax. While for indirect taxes the responsibility of collection is taken by the Royal Customs and Excise Department. Indirect taxes include import duties, export duties, excise duties, sales tax and service tax. Non-tax revenues of the Malaysian Government consists of fees for issue of licenses and permits, fees for specific services, proceeds from sale of government assets, rental of government

property, bank interests, returns from government investments fines and forfeitures. The main collection of non-revenue receipts come from non-revenue receipts and revenue from Federal Territories (Veerinderjeet 2002). During the early stages of its development which is in year 1960, Malaysia similar with most developing countries relied heavily on indirect taxes accounted for 76.7% (Kasipillai, 2006). However as the economy developed and with the tax reform less reliance was placed on indirect tax which starting from year 1999 the major contribution to government revenue is come from direct tax (69%). In 2005 the collection of direct tax represents 51% of the Government total revenue (Economy Report, 2007). It is believed that the encouraging growth in Gross Domestic Product (GDP) in 2006 stood at 22% contributed positively to the national revenue collection (9MP).

### **OVERVIEW OF TAX REVENUE AND GOVERNMENT EXPENDITURE: THE CASE OF MALAYSIA**

Government will present their budget in Parliament around September each year. Determination of budget is based on estimation of government revenue and spending. An increase in government revenue will increase the allocation for government spending. The trend of Federal Government revenue collection is increasing every year but with the average growth of 6.6% per year (8MP). Even though the economic growth is very encouraging the total revenue has decrease to 29.3% for gross GDP in 1985 and 26.4% for GDP in 1990 (Federal Government Financial Position, 2007). The strong growth of the 1990s was interrupted by the Asian financial crisis (9MP). However, from the figures available for year 1986 and 1987, the growth in total revenue appears to be very gloomy. In fact the tax elasticity has been downward from 1.0 in 4MP to 0.6 during the period of 5MP. The downward in revenue collection is due to the increasing in tax exemption and tax incentives to the private sector to increase the investment beside the uncertainty with petroleum price (Veerinderjeet, 2002).

During the 7MP, revenue collected from direct taxes recorded an increase of 5.1%, amounting to RM142.7 billion. The major contribution of the collection came from corporate sector as a result of high profitably due to economic growth. In year of assessment 2000, the collection of tax has been reducing where it has been influence by the restructuring of the tax system. Besides any income which receive in year 1999 was waive from tax. This is inline with the introduction of SAS for companies in 2001 and individual in 2004. The total federal government tax revenue during 8MP period is expected to register a faster growth with the major contribution is from direct tax. Mid-term review of the 8MP shows that direct taxes grew rapidly at an average annual rate of 16.8% per annum and accounted for more than half of total federal government revenue and two-thirds of its tax revenue where collection of corporate tax and individual income tax increased at annual growth rates of 21.5% and 13.9%, respectively (Annual Report LHDN, 2000).

This was mainly attributed from the increase number of taxpayer's inline with the introduction of self assessment system and the higher oil price. While for indirect tax the slower rate of growth was due to a small decline in the collection of export duties following a marginal decline in exports during the review period. With regards to the reduction in number of transactions particularly in 1998 the collection from stamp duties and receipts from estate duty was declined to 3.8% in 8MP. However in 9MP there is no detail discussion on federal government revenue compared to previous Malaysia plan. In fact the chapter on public sector programme and its financing has been replaced with other topics. Nevertheless, based on the Economic Report for the first two years of plan period, tax revenue still become the major contribution of federal government revenue, where the increment of the collection stood at 9%.

It should be noted that the government has kept the corporate tax rate unchanged since 1998, when it cut the rate to 28%. For the individual tax the rates is remained at the scale rate. From the various economic reports, the revenue from tax source which is direct and indirect tax always become major contribution to government revenue. With regards to the reduction in number of transactions particularly in 1998 the collection from stamp duties and receipts from estate duty was declined to 3.8% (8MP.). The IRB has played an important role which contributed RM53.54 billion in direct taxes to the Federal Government's revenue in 2005. This represents an increase of 11.37% from the total of RM48.07 billion collected in 2004 (Annual Report LHDN, 2005). The main contributor to the overall collection of direct tax in 2005 came from corporate tax, which account for more than 70% of the Malaysian federal government's total revenue. Higher revenue from petroleum taxes and dividend payments from the state-run oil company will help government to both increase development spending and reduce taxes. Other than that Malaysia government also relies heavily on revenue from oil and gas industries where the amount of collection reaches RM14,566 million in 2005 (Bloomberg News, 2006).

Direct tax collection dropped by 3.39% if compared to 2002 for all types of direct tax except for petroleum collection. Among the factors which influence this decline of tax collection is the reduction of the corporate tax rate from 28% to 20% (see Table 1). Indeed this reduction also influenced by the effect of the war in Iraq as well as Severe Acute Respiratory Syndrome (SARS) on the country economy. With effect from 2004 onwards Self Assessment System has been implemented to individual tax payer where this reformation has projected an increase collection of tax revenue. In consonance with the growth of Malaysian economy, revenue collection during the first quarter of 2006 increased from the corresponding quarter of 2005 by 14.5%. Typically, tax revenue remained the largest share contributor of the total revenue. The major contributors were individual and corporate income taxes totaling to almost RM40 billion (Quarterly Updates Malaysian Economy, 2006).

**Table 1. Direct Tax Revenues in Malaysia, 2001-2006**

	2001	2002	2003	2004	2005	2006
Companies	20771	24643	23990	24388	26381	28414
Individuals	9436	9889	7984	8977	8649	9649
Petroleum	9859	7636	8466	11479	14566	20404
Cooperatives	71	69	62	49	63	151
Others	0	0	189	1227	1129	1289
Stamp duty	1961	2114	325	2583	2755	2730

Source: Economic Report, 2006

Table 2 shows the inconsistency of sales tax collection due to the price changes of goods. Total indirect tax on the other hand projected an increasing collection in 2005 compared to 2004 except for import duties and surtax. In the non-tax revenue categories, dividend from Petronas is the major contributor to total collection of non tax revenue. However the degree of dependency to non tax revenue is similar with indirect tax revenue. Most of the off-market resources are raised through taxes, with non-tax revenue being less than 5% of GDP in most countries.

**Table 2. Indirect Tax Revenues in Malaysia, 2001-2006**

	2001	2002	2003	2004	2005	2006
Export duties	867	803	1157	1600	2085	2523
Import duties and surtax	3193	3668	3919	3874	3385	2787
Excise duty	4129	4745	5031	6427	8641	8798
Sales tax	7356	9243	7965	6816	7709	6282
Service tax	1926	2214	2038	2349	2582	2595
Others	1922	1836	1765	2281	2649	2241

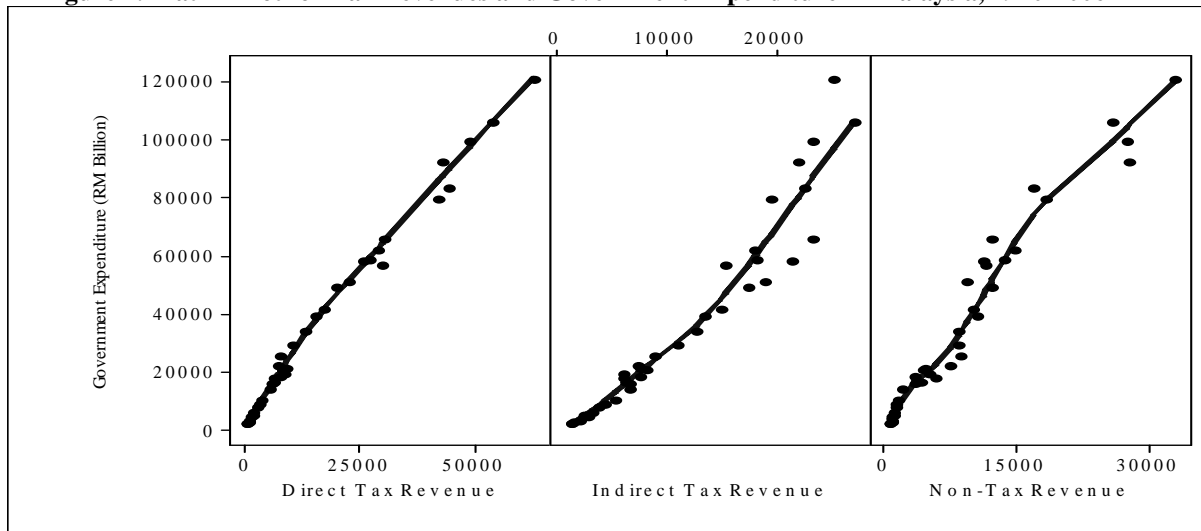
Source: Economic Report, 2006

In the non-tax revenue categories the increase was totaling RM6.9 billion, of which RM2 billion was contributed from PETRONAS dividends, with the rest from higher collection of fees from licenses and permits, particularly motor vehicles and petroleum royalties. However the degree of dependency to non tax revenue is similar with indirect tax revenue. Most of the off-market resources are raised through taxes, with non-tax revenue being less than 5% of GDP in most countries. Mansor et al. (2005) revealed that Malaysian Customs Department had been collecting less indirect taxes revenue each year as compared to the costs incurred in collecting the revenue. The ratio analysis of total arrears to total revenue collected indicated that uncollected indirect tax revenues are on the increasing trend. Compared with direct tax the government is less dependent on indirect tax revenue. Compared to during the early 70 the degree of important of indirect tax is reducing year to year. The expansion of consumer demand in 1999 until 2000 results an extreme growth of sales and service taxes.

In recent years, Malaysia's economic performance has been robust, underpinned by prudent macroeconomic management and structural reform. However the budget tabled to Parliament every year still reported deficit budget. It is believed that the increase in revenue will help lower the budget deficit in gross domestic. In tandem with increasing revenue every year, government continue to stress on capacity building and improving efficiency in laying the foundation for medium and long term sustainable growth. In transitional period of two Malaysia Prime Minister, the focus on spending is slightly different where previous Prime Minister more concentrate on mega project while the current one given the priority to meet the socio-economic needs of the poor with large expenditure earmarked for modernizing and commercializing the agriculture sector.

As shown in Figure 1, there is consistent relationship between government spending and revenue starting from 1970-2006. These mean that every single cent increase in revenue collection leads to an increase in government spending. However, based on the figure 1 direct tax has the most significant relationship with government spending. Although a similar trend was evident for non tax revenue the level of dependency is lesser compared to direct tax. While for indirect tax the trend has changed where lately the government is less depends on this source. It should be noted that the idea of changing the indirect tax income to good service tax is to boost the economy in the future.

**Figure 1. Matrix Plot for Tax Revenues and Government Expenditure in Malaysia, 1970-2006**



Source: Economic Report, 2006

### LITERATURE REVIEWS

Tax policies around the world have been shaped by economic factors. The tax system evolves while each country formulates its own tax and economy policies. In a neoclassical approach, economic growth simply depends on the accumulation of physical and human capital investments. Thereby, any further growth in per capita output simply arises from an exogenous rate of technical change. Therefore, there should be no permanent affects of the tax structure on the growth rate in per capita output, regardless of the size of the misallocations generated by the tax structure (Lee and Gordon, 2005). Yet, empirical investigations still fail to provide conclusive results about the existence of a link between taxation and growth. Several studies, such as Engen and Skinner (1992), Komendi and Meguire (1985), and Wright (1996), find a negative correlation between average level of taxation and output dynamics. Others, such as Koester and Komendi (1989), Easterly and Robelo (1993), Stemrod (1995) and Mendoza et al. (1997), do not detect any significant correlation, neither long nor short run.

Actually, recent literatures on endogenous growth, suggests that positive externalities omitted from the traditional neoclassical models play an important role in explaining long-run economic growth in most developed countries. There are many existing literature on the subject that have contributed useful insight towards an understanding of the role of tax revenues toward the government spending. Most studies in this aspect focused on the relationship between total tax revenue on the keys of determining the flow of government spending (see, for example, Kim, 1998; Easterly and Robelo, 1993; Koester and Kormendi, 1989, Padavano and Galli, 2001). Bondonio and Greenbaum (2007) exploit the exogenous variation of United States enterprise zone policies to estimate the impact of geographically-targeted tax incentives on a number of dimensions of local economic growth. The final results shows an empirical evidence with strong external validity to support specific policy recommendations and show that the impact of the incentives have more complex dynamics than those related by the null mean impact estimates obtained from analyzing net growth outcomes.

Besides that, tests for convergence across nations have been extensively performed in empirical economics. For instance, using time series and cluster analysis Wang (2007) examined the convergence

property of tax burden and per capita gross domestic product among Taiwan, China and OECD countries. Specifically, the author empirically finds non-significant relationship between the integration process and fiscal convergence among the countries. However, the cluster analyses identified the group of China, Taiwan and Korea was stably toward one model during the 1970s, 1980s and 1990s. On the hand, the convergence of tax burden is found in the group, but without any pairwise convergence. Past theoretical work predicts that higher corporate tax rates should decrease economic growth rates, while the effects of high personal tax rates are less clear. Lee and Gordon (2005) explore how tax policies affect a country's growth rate, using cross-country data during 1970-1997. They find that statutory corporate tax rates are significantly negatively correlated with cross-sectional differences in average economic growth rates. Using fixed-effect regressions, both of them find that increases in corporate tax rates lead to lower future growth rates within countries. The coefficient estimates suggest that a cut in the corporate tax rate by 10% points will raise the annual growth rate by 2% points.

Furthermore, many empirical studies and calibration exercises find that a capital tax reform has only a small effect on the long-run growth rate of an economy. But it may have strong effect on investment or more generally on factor allocation and therewith on the level of the growth path; and on welfare (Strulik, 2003). Recent micro-econometric studies have also found robust support for Modigliani and Miller's (1963) proposition that corporate taxation favors debt finance while personal taxation favors equity finance. Since financial decisions of firms are usually neglected in models of economic growth, the question occurs whether the consideration of corporate finance modifies the estimated investment, growth, and welfare effects of tax reforms (Levine and Renelt, 1992; Tanzi and Zee, 1997). Moreover, there is considerable evidence that average tax rates are strongly correlated with public spending. Since some government expenditure, such as public capital and education, is growth enhancing, the coefficient on average tax rates may capture both the negative impact of taxation and positive effect of public expenditure on growth, and by that turns out be statistically insignificant (Barro and Sala-i Martin, 1995).

Other the other hand, the theoretical growth literature argues that increases in distortion taxation lower the growth rate of output. Actually, distortion taxes are defined as those tax rates that alter the price of an accumulated factor of production, such as physical capital, human capital and technology (Yamarik, 2000). Eventually, the neoclassical growth model shows that only the increases in marginal tax rates on physical and human capital lower the traditional growth rate (Turnovsky, 1996). As pointed out by Stokey and Rebelo (1995), large growth effects of flat rate taxes are difficult to reconcile with the current economic situation of developed countries where, in spite of a dramatic increase in income taxes, there has been no discernable change in the long-run growth trend. On the basic of this evidence, some researchers advocate to model the growth rate as exogenous variable. More recent endogenous growth models, however, re-opened the theoretical possibility that government tax policy can affect lower growth rates by introducing human capital or by specifying a particular production function, this model allow physical and human capital accumulation to persist along the balanced growth path. The models' endogenously determined growth rate depends on the net rate of return from investment, which, in turn, depends on the tax rates. Consequently, tax rates can influence the growth rate (Lucas, 1990; Yuen, 1991; Jones and Manuelli, 1990).

According to conventional economic wisdom, capital income taxes should be low and high capital income taxes lead to faster growth in an overlapping generation's economy with endogenous growth. Regarding to Uhlig and Yanagawa (1996), government expenditure are fixed as a fraction of gross national product and are financed with labor income taxes as well as capital income taxes. Since capital income accrues to the old, taxing it relief that tax burden on the young and leaves them with more income

out of which to save. Examining the capital gains realizations elasticity with respect to the capital gains tax, Burman and Randolph (1994) reconciled the strong negative effect found in micro data with the time series evidence, that capital gains are relatively unresponsive. They find that the strong negative effect is essentially a temporary tax timing effect, while the permanent effect, which is relevant for the discussion about growth, is not significantly different from zero and can easily be positive in some regression.

To provide empirical support to these claims, one must sort out and compare is the contribution of tax revenues toward the government expenditures. More precisely, growth theories are correct and previous empirical analyses have been specified the contributions of tax revenues on the economic growth in most of developed countries. Unlike previous literatures, this study adopts time-series data and provides theoretical econometrics analysis to analyze the taxes led government expenditures in Malaysia by applying the vector autoregressive (VAR) approaches.

## DATA AND METHODOLOGY

This study examines the relationship between government expenditure and three major sources of government income, such as direct taxes, indirect taxes, non-tax revenues. Therefore, annual frequency data from 1970 to 2006 are utilized in this study, hence providing 36 observations. All of the data are gathered from the Department of Statistics (DOS) and Central Bank of Malaysia. All data were transformed on logarithmic form and then the series subjected to unit root tests using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The simplest version of the model to be analyzed is the random walk as shown in equation (1):

$$y_t = \gamma y_{t-1} + \varepsilon_t, \quad \varepsilon_t \sim N[0, \sigma^2] \text{ and } \text{Cov}[\varepsilon_t, \varepsilon_s] = 0 \forall t \neq s \quad \dots(1)$$

Under the null hypothesis  $\gamma = 1$ , there are two approaches to carrying out the test. The conventional t ratio with the revised set of critical values may be used for a one-sided test.

$$DF_t = \frac{\hat{\gamma} - 1}{\text{Est.Std.Error}(\hat{\gamma})} \quad \dots(2)$$

The second approach is based on the statistic:

$$DF_t = T(\hat{\gamma} - 1) \quad \dots(3)$$

Actually, the DF tests described above assume that the disturbances in the model as are noise. An extension which will accommodate some form of serial correlation is the Augmented Dickey-Fuller (ADF) test. The ADF test is the same one as above, carried out in the context of the following model:

$$y_t = \mu + \beta_t + \gamma y_{t-1} + \gamma_1 \Delta y_{t-1} + \gamma_2 \Delta y_{t-2} + \dots + \gamma_p \Delta y_{t-p} + \varepsilon_t \quad \dots(4)$$

The random walk form is obtained by imposing  $\mu = 0$  and  $\beta = 0$ ; the random walk with drift has  $\beta = 0$ ; and the trend stationary model leaves both parameters free. The test statistics are exactly as constructed as equation (5):

$$DF_t = \frac{T(\hat{\gamma} - 1)}{1 - \hat{\gamma}_1 - \hat{\gamma}_2 - \dots - \hat{\gamma}_p} \quad \dots(5)$$

The advantage of this formation is that it can accommodate higher-order autoregressive processes in  $\varepsilon_t$ . The basic problem that encountered in the use of DF and ADF tests is the lack power of the tests. The power of a test is its ability to detect a false null hypothesis and it is measured by the probability of rejecting the null hypothesis when it is false. It has been proved; using Monte Carlo simulations, the power of the unit root tests is very low. Therefore, many alternative to the DF and ADF tests been suggested, in some cases to improve on the finite sample properties and in others to accommodate more

general modeling framework. The Phillips-Perron (PP) statistic may be computed for the same function forms as been discussed earlier to overcome the weakness of the DF and ADF stationary test modeling.

$$y_t = \delta_t + \gamma y_{t-1} + \gamma_1 \Delta y_{t-1} + \gamma_2 \Delta y_{t-2} + \dots + \gamma_p \Delta y_{t-p} + \varepsilon_t, \text{ where } \delta_t \text{ may be } 0, \mu, \text{ or } \mu + \beta_t \quad \dots(6)$$

In this study, we used ADF and PP tests principles. Eventually, by combining the ADF and PP procedure, it is likely to provide more clear-cut conclusion with regard to the order of integration for all the series.

### Cointegration Tests

Basically, cointegration means that the non-stationary variables are integrated in the same order with the residuals stationary. If there is cointegration between variables, there is a long-run effect that prevents the two time series from drifting away from each other and there exists a force to converge into long-run equilibrium. The JJ procedure utilize two likelihood ratio (LR) test statistics for the number of cointegrating vectors, and secondly the maximum eigenvalue and trace statistics. The trace statistic tests  $H_0(r)$  against  $H_1(p)$  and is can express as follows:

$$\lambda - \text{trace} = -T \sum_{i=r+1}^p \ln(1 - \hat{\lambda}_i) \quad \dots(7)$$

Meanwhile the maximum eigenvalue statistic test also can be express as follows:

$$\lambda - \text{max} = -T \ln(1 - \hat{\lambda}_{r+1}) \quad \dots(8)$$

In addition, the critical values for both maximum eigenvalue and trace tests are tabulated in Osterwald-Lenum (1992). We assume that  $y_t$  is government expenditure and it can be modeled as a vector autoregressive (VAR) equation as follows:

$$y_t = \Pi_1 y_{t-1} + \Pi_2 y_{t-2} + \dots + \Pi_k y_{t-k} + \mu_t \quad \dots(9)$$

Indeed, equation (7) also can be transformed into first-difference form as follows:

$$\Delta y_t = \sum_{j=1}^{k-1} \Gamma_j \Delta y_{t-j} + \Pi y_{t-k} + \mu_t \quad \dots(10)$$

Where,  $\Pi$  is the long run relationship between the variables in  $y_t$  process. The estimation of the cointegrating vectors can be determined from the matrix of  $\Pi$ , which is written as  $\Pi = \alpha\beta$ .

### Vector Autoregressive Model

The notations of cointegration are closely related to vector autoregressive model (VAR). They involve specifically several equations relating different independent variables to their own past values as well as those of other independent variables. Such models are extremely popular in empirical macroeconomics literature, especially for forecasting macroeconomics variables. In addition, if the long-run equilibrium did not exist between two time-series in this study, a short-run dynamic relationship can be investigated through the VAR estimation. The basic concept of VAR models for purpose of this study can be express as follows (Note: VAR model with one-order autoregressive specification).

$$\begin{aligned} GEX_t &= \beta_0 + \beta_1 GEX_{t-1} + \beta_2 DTR_{t-1} + \beta_3 IDTR_{t-1} + \beta_4 NTR_{t-1} + \mu_t \\ DTR_t &= \alpha_0 + \alpha_1 GEX_{t-1} + \alpha_2 DTR_{t-1} + \alpha_3 IDTR_{t-1} + \alpha_4 NTR_{t-1} + \varepsilon_t \\ IDTR_t &= \gamma_0 + \gamma_1 GEX_{t-1} + \gamma_2 DTR_{t-1} + \gamma_3 IDTR_{t-1} + \gamma_4 NTR_{t-1} + v_t \\ NTR_t &= \phi_0 + \phi_1 GEX_{t-1} + \phi_2 DTR_{t-1} + \phi_3 IDTR_{t-1} + \phi_4 NTR_{t-1} + w_t \end{aligned} \quad \dots(11)$$

It should be noted that in each equation the current values (that is, at the time  $t$ ) of the independent variables do not appear; only their past values do. With out this features, the model will become a regular simultaneous equation model. On the other hand, the number of lags for VAR models is determined by

using the Akaike Information Criteria (AIC). Basically, the optimum lag is selected with the lowest values of AIC with the rejection of the null hypothesis in LR test.

### EMPIRICAL RESULTS

The results for stationary test, using ADF and PP are presented in Table 3. When the series is at the level form, the null hypothesis cannot be rejected, shows that all four variables in this study are non stationary. Eventually, when this happens, the first differencing of the series is a must. As shown in Table 3, all four series in their first difference form are now able obtain stationary. Therefore, the second differencing is not necessary. Thereby, we conclude all series are  $I(1)$  and cointegration tests are compulsory to analyze the relationship between the variables in this study

**Table 3. Stationary Tests**

Variables	ADF Test ( $\tau$ )		PP Test ( $Z_t$ )	
	Level	First Differences	Level	First Differences
GEX	-1.53(2)	-3.77(1)*	-2.27[0]	-4.22[0]*
DTR	-1.68(0)	-4.78(0)*	-1.64[2]	-4.79[1]*
IDTR	-2.18(0)	-5.43(0)*	-2.34[3]	-5.43[1]*
NTR	-1.38(1)	-8.50(0)*	-0.82[2]	-8.47[1]*

Note: Lag length in ( ) and Newey-West value using Bartlett kernel in [ ]

Asterisks (\*) and (\*\*) denote statistically significant at 1% and 5% significance levels.

Since the series integrated in the same order, therefore we proceed with the Johansen multivariate cointegration procedure to investigate the long-run relationship between government expenditure, direct tax revenues, indirect tax revenues and non-tax revenues. Table 4 presented Johansens' cointegration tests with suitable test statistics, such as maximum eigenvalue and trace tests.

**Table 4. Johansen's Cointegration Tests**

Null Hypotheses	Maximum Eigenvalue	$\lambda_{\text{Trace}}$ [k=1,r=0]	Critical Value (5%)	Critical Value (1%)
r=0	0.45	44.21	47.21	54.46
r≤1	0.29	22.84	29.68	35.65
r≤2	0.18	10.49	15.41	20.04
r≤3	0.09	3.38	3.76	6.65
Null Hypotheses	Maximum Eigenvalue	$\lambda_{\text{Max-Eigen}}$ [k=1,r=0]	Critical Value (5%)	Critical Value (1%)
r=0	0.45	21.36	27.07	32.24
r≤1	0.29	12.35	20.97	25.52
r≤2	0.18	7.11	14.07	18.63
r≤3	0.09	3.38	3.76	6.65

Note: Asterisks (\*) and (\*\*) denote statistically significant at 1% and 5% significance levels.

The multivariate cointegration findings shows, both maximum eigenvalue and trace test statistics do not exists any cointegrating vectors at either 1% or 5% significance level. This implies that the variables do not existed strong relationship between each another. Given the existence of a unique cointegrating

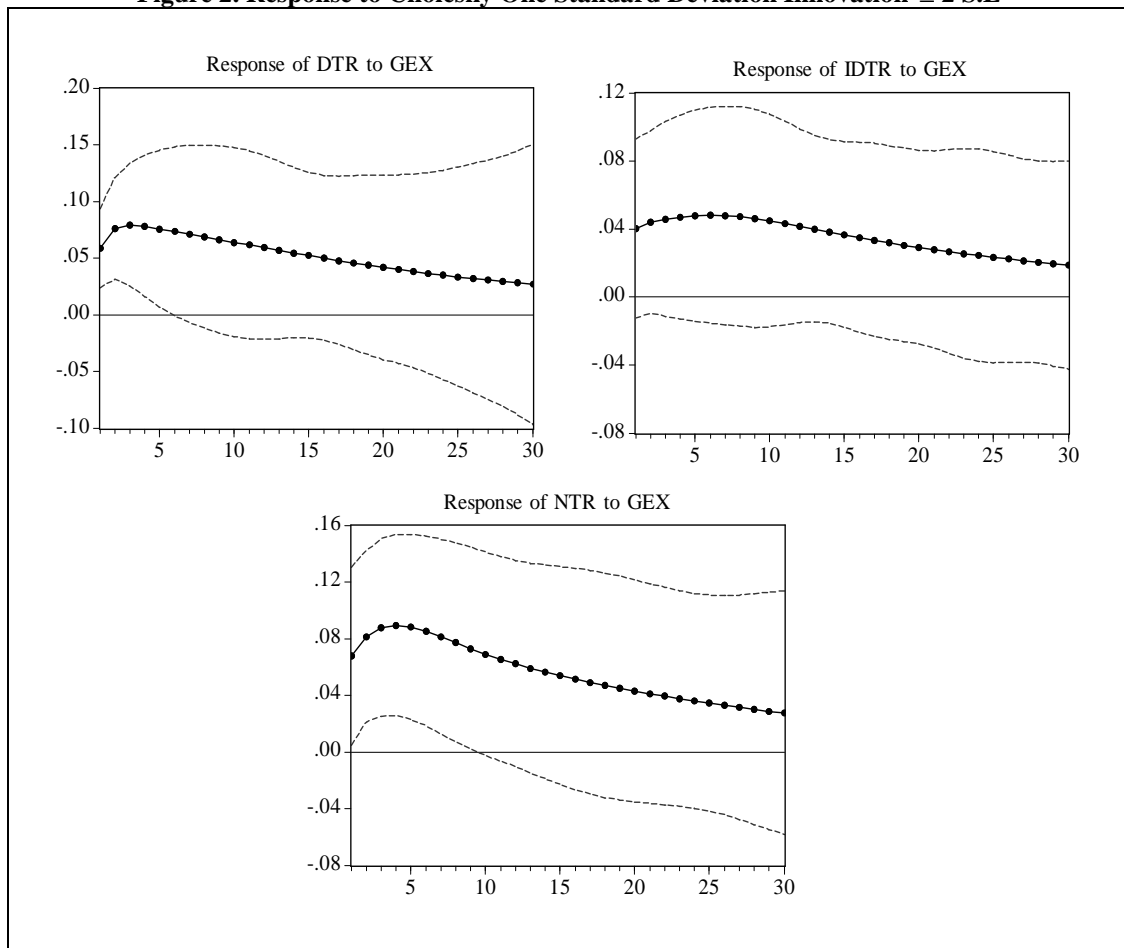
vector, we proceed with the VAR model to investigate the long-run relationship between the variables. One requirement for VAR model are the choice of lag length selection, and this is an important matter because as we concern the VAR model are quit sensitive. Therefore, we use the AIC to select the optimum lag length of these VAR model. The VAR estimated models of this study is can be express as follows (Note: Asterisks (\*) and (\*\*) denote statistically significant at 1% and 5% significance levels).

$$\begin{aligned}
 GEx &= 0.03 + 0.94GEX_{t-1} - 0.05DTR_{t-1} + 0.20IDTR_{t-1} - 0.07NTR_{t-1} \\
 &\quad [-0.05] \quad [6.02] \quad [-0.40] \quad [1.79] \quad [-1.15] \\
 DTR &= -2.47 + 0.44GEX_{t-1} + 0.21DTR_{t-1} + 0.62IDTR_{t-1} - 0.04NTR_{t-1} \\
 &\quad [-3.78]^* \quad [2.51]^* \quad [1.31] \quad [4.99]^* \quad [-0.65] \\
 IDTR &= 0.42 + 0.09GEX_{t-1} - 0.14DTR_{t-1} + 0.90IDTR_{t-1} + 0.10NTR_{t-1} \\
 &\quad [0.47] \quad [0.40] \quad [-0.66] \quad [5.18]^* \quad [1.07] \\
 NTR &= -1.08 + 0.40GEX_{t-1} - 0.03DTR_{t-1} + 0.04IDTR_{t-1} + 0.64NTR_{t-1} \\
 &\quad [-1.03] \quad [1.43] \quad [-0.13] \quad [0.23] \quad [5.63]^*
 \end{aligned}$$

Next we present the results of the concept of impulse response function, which has ability to trace the effect of a standard deviation shock to a variable on the time path of all the variables in the time series system. The impulse response function is also used to investigate the persistence of shocks. This analysis is based on the VAR estimation. Therefore, we aim to analysis the impact of a one standard deviation shock in GEX on the objective variable, such as DTR, IDTR and NTR. (Note: Only the impulse response functions of the variables that we are interested to analysis are presented in Figure 2. The results show that the eventual impact of an unexpected economic scenario on the objective variables is permanent and remain positive values horizontally at the end of 30 years. More specifically, Figure 2 shows the simulated impact of a shock of typical size term of the government expenditures of 30 years period following with some hypostatical shock.

For the whole sample period, it can be concluded that the response of the objective variable to economics policies shocks are as predicted by the tax revenue transmissions. In addition, revenue growth during 1970's was extremely good. This was supported with strong economic growth in line with the objective of First Malaysia Plan to stimulate new lines of economic activity. Where, in the period of 1980, the tax increase has been imposed to a few commodities which were considered as either luxury or non-essential goods. While in early 1990 until 1997 there is an upturn in economic after recession period. However the downward in corporate earning and economic crisis has reduced the revenue collection in 1998 and 1999. This was also influence from the government decision to cut the corporate tax rate to 28% in 1998. Starting from 2000, the Malaysian government has taken a serious action to control the collection where 1999 has become the waiver year where there is no collection for that particular period. To replace Official Assessment System (OSA), the Self Assessment System (SAS) has been implemented in 2001 for companies and 2004 for salaried individual. Other than that government keeps offering better tax incentives such as Pioneer Status and Investment Tax Incentives to attract the foreign investor as well as domestic investor to invest in this country.

**Figure 2. Response to Cholesky One Standard Deviation Innovation  $\pm 2$  S.E**



The variance decomposition for 1, 5, 10, 15, 20, 25 and 30 years, forecast variances for GEX, DTR, IDTR and NTR are reported clearly in Table 5. The entries in the table are percentages of return forecast variances and it can be explained by random innovations. Basically, the variance cause by depend and independent variables due to the historical innovation is becoming less important. Overall the variance decomposition confirms our findings regarding the contribution of tax revenues toward the government expenditures for 30 years period. From the reported results in Table 5, for GEX, the average 34.60% is explained by its own forecast error variances. Meanwhile, the average variance explained by other variables falls from 6.37% (DTR), 33.62% (IDTR), 13.49% (NTR), and mainly due to the decreased. In essence, the variance decomposition results reveal that all economies under this study greatly influenced, or explained by specific shock and less vulnerable to other shocks such as the regional and global shocks. These results are not surprising as these economies experienced no major changes in macroeconomics policies during the Asian currency crisis. Looking at the results of the variance decomposition for the different periods, the basic pattern is still remains positively.

**Table 5. Variance Decomposition Analysis Results**

Variance Decomposition of GEX					
Period	S.E.	$\Delta$ GEX	$\Delta$ DTR	$\Delta$ IDTR	$\Delta$ NTR
1	0.094227	100.0000	0.000000	0.000000	0.000000
5	0.211512	77.53039	1.828741	19.52403	1.116835
10	0.280190	66.31140	1.864246	31.12185	0.702506
15	0.314095	63.34902	1.682571	34.29802	0.670389
20	0.333566	62.21766	1.590209	35.52617	0.665957
25	0.345475	61.63053	1.542948	36.16635	0.660163
30	0.352906	61.29165	1.516178	36.53575	0.656427
Average	0.275996	34.60306	1.432128	27.59602	0.638897
Variance Decomposition of DTR					
Period	S.E.	$\Delta$ GEX	$\Delta$ DTR	$\Delta$ IDTR	$\Delta$ NTR
1	0.104525	31.60042	68.39958	0.000000	0.000000
5	0.274371	36.40758	16.28634	47.06210	0.243992
10	0.353259	40.87028	10.10789	48.29488	0.726952
15	0.393463	43.42348	8.289425	47.53266	0.754442
20	0.417568	44.59079	7.459866	47.21559	0.733751
25	0.432380	45.19058	7.018603	47.06877	0.722044
30	0.441612	45.53310	6.765507	46.98559	0.715797
Average	0.345311	41.08803	6.376229	40.59423	0.556711
Variance Decomposition of IDTR					
Period	S.E.	$\Delta$ GEX	$\Delta$ DTR	$\Delta$ IDTR	$\Delta$ NTR
1	0.144971	7.753739	12.40612	79.84014	0.000000
5	0.255634	15.51048	5.318573	76.16459	3.006356
10	0.295514	24.15518	4.003826	68.30767	3.533327
15	0.318816	28.64888	3.538671	64.65854	3.153907
20	0.333468	30.81702	3.314954	62.94229	2.925729
25	0.342555	31.99961	3.189275	62.00958	2.801540
30	0.348246	32.69519	3.115055	61.46043	2.729324
Average	0.291315	24.51144	4.983782	33.62829	2.592883
Variance Decomposition of NTR					
Period	S.E.	$\Delta$ GEX	$\Delta$ DTR	$\Delta$ IDTR	$\Delta$ NTR
1	0.167824	16.29715	14.34460	0.008392	69.34986
5	0.275668	45.61325	8.493298	3.779615	42.11384
10	0.350036	52.64261	5.640900	15.52816	26.18834
15	0.394683	52.76050	4.690754	21.89760	20.65115
20	0.420368	52.78205	4.245218	24.70264	18.27010
25	0.435915	52.82773	4.010166	26.13067	17.03144
30	0.445596	52.85683	3.876383	26.94258	16.32420
Average	0.355727	46.54002	6.471617	16.99852	13.49204

Note: Average value of variance decomposition is calculated for 30 years period consequently

## CONCLUSIONS

The purpose of this study is to empirically examine the hypothesis of long-run taxes led on government expenditure in Malaysia during the period of 1970 to 2006. This line of inquiry is highly relevant not only due to its implication to the competing growth models, but also to the fact that revenues from taxes been really led on the government expenditures, especially the contribution of direct tax revenues. This study finds that there are consistent dependent between revenue and government spending in the long-run. Essentially, there is huge possibility that government will have deficit budget if the

revenue cannot support the expenditures. However, the results shows that government are strongly depend on direct tax revenue such as income tax from individuals, companies, other persons and petroleum, stamp duty, estate duty and real property gains tax. While for indirect tax which consist of import duties, export duties, excise duties, sales tax and service tax the level of dependency become less important compare in early 1970s.

This was strongly attributed to the fragile of economy and the significant contribution from foreign direct investment (FDI) to our economic development efforts. In particular the tax policy reforms are found to positively affect the economic growth. Government has continuously improved their tax administrations which contributed to increasing revenue collection. Among the new changes which has been and will be implemented was SAS and GST. However it is believed that Malaysia must focus more on efforts to increase domestic investment, given the decline in international capital flows, arising from uncertainties in the global environment and greater competition for FDI, particularly from China and Japan. This line of inquiry is certainly worth investigating and will be included in future research and we strongly believe that future research is warranted to shed more light on the underlying forces generating government expenditures. Finally, further research is suggested to take others factor into consideration such as dummy variables with Granger Causality tests.

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