

FISCAL POLICY AND ECONOMIC GROWTH: AN EMPIRICAL EVIDENCE IN MALAYSIA AND INDONESIA

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Abstract

Since the financial crisis occurred in the mid of 1997, generally the government of Asian countries have difficulties in supporting their economic growth. This paper attempts to analyze the relationship between fiscal variables, including government expenditure, revenue and output in Malaysia and Indonesia. The relationship between government expenditure and revenue will be tested by co integration and causality test, meanwhile the effect of government expenditure and revenue on output will be tested using Vector Error Correction Model (VECM). The result shows that there are strongly long run relationship between fiscal variables and output in these two countries. More active fiscal policy is recommended in Malaysia, meanwhile a better fiscal management must be applied in Indonesia.

Key words: *Co integration, Causality, Error Correction Model, Fiscal policy.*

INTRODUCTION

In recent years, fiscal policy tends to be important in supporting economic growth in Asian countries. Generally, fiscal policy is the economic policy done by the government in terms of controlling the budget, which covers government revenue and expenditure in order to get an optimum economic growth and to stabilize the economy in a whole. The main sources of government revenue are tax, besides of foreign debt and other domestic sources such as sales of gas and oil. Government expenditure consists of routine expenditure and development expenditure. The routine expenditure is a purchasing for a variety of goods, services purchasing, such as payment of civil servants' salary, payment of foreign debt and subsidies for people. The development expenditure constitutes expenditure for financing the physical and non-physical development in each region. Such expenditure can be said as a public investment. If the activity of private sector increases rapidly, it would cause to enlighten the burden of government investment.

The direct impact of government economic activity towards the national economy is shown by the effect of government expenditure on the main macroeconomic indicators. Inappropriate management of expenditure would, of course, inflict the economy that is, national economic inefficiency, and fiscal illusion (Bruno and Carine, 1996; Miller and Russek, 1997). Another problem arisen by the inappropriate fiscal policy yields crowding out, as it would decline private investment. To avoid the problems, the management of fiscal must be prudently implemented.

The fact that the budget deficit policy in Asian countries going up higher in recent years and the addition of government expenditure achieving average rate more than 10 percent shows that the commitment of government is to support economy by doing budget policy. The policy would certainly imply to budget policy in regional level at province and at regency consistently. Nevertheless as stated before, the total government expenditure does not reflect real people's

demands. If it happens, it will create inefficient expenditure allocation (Walfson, 1993).

Expansive fiscal policy, that is the growth of expenditure is higher than that of government revenue, tax in particular, would give positive impact to output and level of income. Such fiscal policy is shown by deficit budget policy. The increase of government deficit budget would also increase the aggregate demand. The components of aggregate demand are household consumption, private investment, government expenditure and net export. It can also be said that deficit budget would also influence the growth of government expenditure (Rose and Hakes, 1995). This mechanism can be understood because the policy of deficit budget would increase economic activities as to increase people's income. The increase of income would economically increase demands of goods and services, including goods and services produced by the government.

Further observation and research on the effects of government expenditure to the economy in a whole, both in short term period or long-term period, therefore, need to be conducted. This paper attempts to analyze the causal relationship between government expenditure and revenue and the effect of government expenditure on output in both Malaysia and Indonesia. This article focuses on nominal government expenditure, revenue and real gross domestic product. The dynamic models, such as co integration and error correction model (ECM), which are popular in the last ten years, are employed for these purposes. In addition, pre tests of unit root and degree of integration are also used to get a valid regression.

LITERATURE REVIEW

Other research on government expenditure giving a new finding was conducted by Hondroyiannis and Papapetru (1996). The two researchers observed causal relation

of government expenditure and revenue using co integration approach and ECM (Error Correction Model). Choosing this model was based upon assumption of equilibrium relation inter-variables in the long-term period. The result of research shows that, based on the co integration approach, the two variables have long-term relationship. Other finding was that the more real relation was that the government expenditure would increase government incomes. This result implies that the deficit fiscal policy is much more determined by enhancing government expenditure. Both researchers suggested that to enhance the efficiency of government expenditure, decreasing of rapidity of government expenditure growth should be done.

Several alternatives hypotheses of government finance have been put forward to explain both the relation between government expenditure and revenue, or government expenditure and output. Peacock and Wiseman (1979) support the spend-tax model. In other words, it means that increasing in government expenditure will lead revenue. This theory are supported by Anderson, et.al, (1986), and also Von Furstenberg (1986). The tax-spend model was formulated by Friedman (1978). Several findings support this assumption; there are Manage and Marlow (1986), Ram (1988) and Blackely (1986). He suggests that expenditures adjust to weather level can be supported by taxation. In other hand, Meltzer and Richard (1981) support that government expenditure and revenue are simultaneously determined. Bohn (1991), Baghestoni and Mc Nown (1994) support this hypothesis.

Chang, et.al, (2002) also analyzed the causal relationship between government expenditure and revenue in South Korea, Taiwan and Thailand. The results show that in South Korea, unidirectional causality from Government spending to tax supports the spend-tax hypothesis, meanwhile in Taiwan the results support tax and spend hypothe-

ses. The case for Thailand shows that there is no causality between government expenditure and revenue. Finally, we can conclude that the results of government expenditure and revenue in these two countries are mixed. In their research, they also analyzed the relation between fiscal variables and output. By using Malaysian annual data, Jusoh and Tsen (1996) also found that the fiscal variables have strongly relation with output. Generally, government expenditure has causal relation with output, but the revenue does not.

The identification of causal relation between government expenditure and revenue provides insight as to how different policies might, or might not, help control the growth of the government expenditure. If the causality runs from government revenue to expenditure, the imposition on additional taxes to restrict the size of deficit budget will increase it. Contrary, if the causal relation runs from government expenditure to revenue, then restricting government spending should restrict the budget deficit. These are the importance of examining the causality of government expenditure and revenue on the fiscal policy implementation for getting optimum economic growth.

Some empirical studies have generally suggested that government expenditure has positive effects on economic growth (Diamond, 1989). Much of recent literature on this topic describes a non-linear relationship that is positive when the share of government in economic activity is low, but changes downward as the relative size of government grows. As generally known that government contributes to the economic growth by providing basic public goods and infrastructures. However, as government expands its scope, it will cause increasing in economic inefficiency. Higher government expenditure also requires increased tax rates, which will reduce work incentives (Sheehy, 1993). This is also the rationale to analyze

the effect of government expenditure on output in these Asian two countries.

THE RECENT HISTORY OF FISCAL POLICY IN MALAYSIA AND INDONESIA

The Malaysian economy is considered as one of fast growing economies, capturing the headline for a success growth theory. Since independence in 1957, the government's role in the economy may be characterized by various phase of involvement. During the early years of independence, the government largely played supplementary roles to the private sector by directing public expenditure toward providing basic and necessary infrastructure and by diversifying the economic base of the country. Since Malaysia has a successful economic growth for two decades comparing those of other ASEAN countries, its average is in the range of 5 percent to 10 percent. In the period of 1970-1997 the growth performance of the Malaysian economy was very impressive. Except in 1975, Malaysia recorded a growth rate of GDP well over 6 % for each year over the 1970s. Meanwhile in 1985 Malaysia recorded a negative growth rate for the first time since its independence. The quick recovery that took place soon afterward, however, since 1987 the economy has well performed with an average growth of real GDP over 8 percent. Just prior to the crisis, the countries economic performance was outstanding. Growth in real domestic product (GDP) in the period 1990-1997 averaged 8 % per annum.

For these past two decades government expenditure has been growing at rapid rates. It implies that a high proportion of government plays an important role in economic activity. In the period of 1966-1985 the government expenditure constitutes more the 30 % of the GDP, meanwhile it increases during last fifteenth years. The range of expenditure is wide, ranging from 25 % in 1966 to 38 % of GDP in 1985. In contrast it

becomes more than 40 % of GDP in order to stimulate the economy after Asian crisis beginning in the mid of 1997.

Prudential financial and fiscal policies had kept inflation low at less than 3 % and the country enjoyed fiscal surpluses. The government's fiscal stimulus as well as accommodative monetary policy, has supported economy recovery. The federal government's deficit of 4 % of GDP in 1999 has helped offset the decline in private demand. The government's initiatives to strengthen the macroeconomics fundamentals will bring the economy to be more stable in the future.. New sources of growth are being developed, as well as a prudential fiscal policy; to diversity the economy and move into higher value added activity.

Indonesian economic has experienced several stages of economic growth and stabilization during the New Order regime since 1969. In the two decades of Suharto era, the pattern of deficit fiscal policy is applied by the center government in Indonesia. It aims at keeping the economic stability and the increase of economic growth rapidity. The other reason is that during ten years of recent development also shows that monetary policy did not significantly give benefits to the economic stabilization. In line with the deficit fiscal policy, the total of government expenditure, in fact, undergoes to yearly increasing. The fiscal policy pattern applied by the government would influence to the level of macroeconomic indicators.

The economic growth indicated an adequately high rate since 1970s. During the decade of 1980s the economic growth was average more than 5 % per year. This grasp could compete until the mid of 1980s since in 1985 the world economic crisis suffered Indonesian economy as well, but by early 1990s the Indonesian economic achievement began to downward. Generally it can be said that the GDP during the New Order administration was in position on 5 % above aver-

age per year. This achievement was notably better than those of others in European countries having only 3 % in average per year. But the achievement ceased by the economic crisis in 1997, which consequently underwent a drastic decrease.

During ten years before the economic crisis in 1997 occurred, the rate of economic growth achieved 5 % above average per year in which inflation rate could be pressured below 10 % per year particularly within the late ten years. Another indicator was current account pointing out that deficit rate went much higher since 1980 until 1995. The macroeconomic condition cannot naturally be apart from the budget deficit policy, which achieved 2.3 % during 1980-1990. Such economic condition was in fact followed by the higher foreign debt, that is in 1980 achieving 28.0 % out of GDP, but then in 1995 achieving 56.9 % out of GDP. Because the economic crisis has suffered Indonesia since 1997, the rate would of course be multiplied more higher. The condition was worsening by relatively high ICOR value, i.e, between 4-5. This number showed that there was low economic efficiency, including the efficiency of state finance management (government expenditure). From the fact above, it can be said that government expenditure must be prudentially managed.

METHODOLOGY

In general, economic theories explain long run phenomena. In line with this definition, methods of analysis used in the research should accommodate this assumption. The co integration-error correction model (ECM) approach, does not only encompass both level and difference in the variable may capture the short and long run properties of the model, but also provides an attractive statistical framework and represents the concept of long run relationship between variables. With respect to the theory of co integration, we need to analyze the

time series properties of economic variables. It means that we have to satisfy ourselves whether the underlying data processes are stationary or not. In the case that the variables in question are not stationary and co integrated series, the regression equations related to time series data are spurious. It means that testing for unit root and co integration can be considered as a pre-test before making a valid regression.

Testing for co integration and causality between the two or more variables are generally done in two steps. The first step is to verify the unit root condition or the test for order of integration of the variables since the causality test are valid if the variables have the same order of integration. Macroeconomic time series generally contain unit roots and are dominated by stochastic trends. Unit root tests detect non-stationarity that would invalidate standard empirical analysis. Standard test for the presence of unit root among variables based on the work of Dicky and Fuller (1981) are used to investigate the degree of integration of the variables used in this empirical analysis. The Akaike information criterion (AIC) determines the optimal backward lag specification. Let, for example G_t represent the government expenditure series, the null hypothesis of unit root is tested using the DF t-test. The test statistic, t_σ , is the usual t-statistic for testing $H_0: \sigma_1 = 0$ in the following equation:

$$\Delta \log G_t = \sigma_0 + \sigma_1 \mathbf{B} \log G_t + \sum_{i=1}^k \theta_i \mathbf{B}^i \Delta \log G_t + \mathbf{e}_t \quad (1)$$

where, Δ refers to first difference, \mathbf{B} is backward lag operator, k indicates optimal backward lag based on AIC. The distribution of t_σ , does not follow a student-t distribution, but its empirical distribution is tabulated by McKinnon (1991). A rejection of the null hypothesis implies that the log gov-

ernment expenditure data is integrated of order 0, $I(0)$, and is therefore stationary.

To allow for the possible presence of deterministic time trend, equation (1) is augmented with time trend component in order test the presence of unit root. So, the equation will be:

$$\Delta \log G_t = \sigma_0 + \sigma_1 \mathbf{T} + \sigma_2 \mathbf{B} \log G_t + \sum_{i=1}^k \theta_i \mathbf{B}^i \Delta \log G_t + \mathbf{e}_t \quad (2)$$

The augmented Dicky-Fuller (ADF) t statistic for testing the hypothesis of unit root, $H_0: \sigma_2 = 0$, is also based on the work of McKinnon (1991). If the null hypothesis of unit root in equation (2) is not rejected, the order of integration of $\log G_t$ could be one or higher. Therefore we must proceed to test the presence of unit root for $\log G_t$ in the first difference form. The test statistic, t_σ , is the usual t-statistic for testing $H_0: \sigma_1 = 0$ in the following equation:

$$\Delta^2 \log G_t = \sigma_0 + \sigma_1 \mathbf{B} \Delta \log G_t + \sum_{i=1}^k \theta_i \mathbf{B}^i \Delta^2 \log G_t + \mathbf{e}_t \quad (3)$$

A rejection of the null hypothesis implies that the log series is in the degree of integration 1, $I(1)$. Furthermore, we can continue with testing of co integration for among variables. Given the presence of unit roots, the question becomes whether there is some long run equilibrium co integrating relationship between variables.

The second steps is to test the existence of co integration between variables, meanwhile testing for causality will be used vector error correction model (VECM). According to Engle and Granger (1987), if two variables are integrated of degree $I(1)$ and are co integrated then either uni-directional or bi-directional Granger causality must exist in at least the $I(0)$ variables. This temporal causality can be captured through the vector error correction model (VECM) de-

rived from the long run co integrating vectors (Granger, 1988). In this analysis we use the Johansen multivariate procedure (Johansen and Juselius, 1990) for testing the co integration. The Johansen maximum likelihood allows testing multivariate frameworks and avoids some of the drawbacks of Engle-Granger (1987) co integration methodology. Based on the Johansen and Juselius (1990), a VAR model is fitted to the data to find the appropriate lag structure. A VAR model of order p of time series data can be written as follow:

$$\Delta G_t = \pi B'G_t + \sum_{i=1}^{p-1} \theta_i B' \Delta G_t + \epsilon_t \quad (4)$$

The long run relationship in the data set is captured in the matrix π . The rank of the coefficient matrix π gives the number of co integrating vectors. This estimation is based on the estimating the π matrix in an unrestricted form, and then test if the restrictions implied by reduced rank of π can be rejected. The rank of π is r , equals the number of co integrating vectors, which is tested by the maximum eigenvalues (λ_{max}) and trace statistics. Testing of the null hypothesis of at least r co integrating vectors against the alternative hypothesis of full rank, based on the likelihood ratio trace test given by (5) and eigenvalue max by (6):

$$Q_r = -N \sum_{i=r+1}^3 \log (1 - \lambda_i) \quad (5)$$

$$\lambda_{max} = -N \log (1 - \lambda_i) \quad (6)$$

Where $r = 0, 2, 3$ and λ_i is the i -th largest eigenvalue. The critical values of these statistics are obtained from Osterwald – Lenun (1992). The AIC is also used to determine the optimum lag (p) of equation (4). If the rank of π equals to zero or p ($r = 0$ or $r = p$),

co integration does not exist. So, co integration only occurs in the condition of $0 < r < p$.

The third step involves utilization of the VECM modeling and testing for causality relationship. Engle and Granger (1987) exhibit that in the presence of the co integration, there always exists a corresponding error correction representation which implies that the change in dependent variable are a function of the level of disequilibria in the co integrating relationship, captured by error correction term (ECT), as well as changes in explanatory variables. Thus, through ECT and VECM modeling establishes an additional way to examine the causality. In the same way, we will develop the model, which has an explanatory variable and error correction term (ECT) obtained from co integration equation. The using of VECM is not only to get a valid regression, but also to explain the effect of government expenditure on output in short run phenomena for each country. After that, we also use impulse response analysis to capture dynamic interactions and speed of adjustments.

EMPIRICAL RESULTS

We employed annual data include economic growth (EG), government expenditure (GE) and government revenue (REV) for Malaysia (1966-2001) and Indonesia (1969-2001), which is all in natural logarithms of real terms, except economic growth is in level. Data are obtained from several annual report of International Financial Statistics, World Bank. The results of unit root tests of the data series with and without time trend component are presented in table 1. The null hypothesis of unit root on the level cannot be rejected for all data series although at 10% level of significance. In contrast, the null hypothesis of unit root on the first difference can be rejected for all data series at least at 10% level of significance. It indicates that these series are all stationary and hence I (1).

Table 1.
ADF Unit Root Test

	Variables	Level		First Difference	
		DF	ADF	DF	ADF
Malaysia (1966-2001)	EG	-1.161 (1)	-1.821 (1)	-3.250 (1)**	-3.367 (1)**
	LREV	-1.538 (1)	-0.951 (1)	-3.415 (1)**	-3.783 (1)**
	LGE	-1.007 (1)	-1.667 (1)	-3.622 (1)**	-3.834 (1)**
Indonesia (1969-2001)	EG	-2.139 (1)	-1.193 (1)	-3.198 (1)**	-3.968 (1)*
	LREV	-2.272 (1)	-2.447 (1)	-2.898 (1)***	-3.494 (1)***
	LGE	-1.654 (1)	-2.229 (1)	-2.724 (1)***	-3.111 (1)***

NOTE: *, **, *** indicate 1, 5 and 10 percent level of significances respectively.

() indicates optimum lag based on AIC

SOURCE: Author's estimation

Table 2.
Empirical Johansen Co integration Test

Malaysia EG, LREV, LGE (VAR lag =1)				
Null Hypotheses	λ - max	λ - max (5%)	Trace	Trace (5%)
Ho : r = 0	18.654*	17.89	30.334*	24.31
Ho : r ≤ 1	11.664	11.44	11.680*	12.53
Ho : r ≤ 2	1.176	3.84	1.181	3.84
Indonesia EG, LREV, LGE (VAR lag =3)				
Null Hypotheses	λ - max	λ - max (5%)	Trace	Trace (5%)
Ho : r = 0	19.713*	17.89	38.236*	24.31
Ho : r ≤ 1	18.512*	11.44	18.523*	12.53
Ho : r ≤ 2	0.350	3.84	0.351	3.84

NOTE: * indicates 5 percent level of significances.

SOURCE: Author's estimation

Due to the Engle-Granger representation theorem (1987), co integration test will be valid if a set of series data is stationary and has the same degree of integration. The co integration test, therefore applied on these series and the results are reported in table 2. With Johansen procedure and optimum lag based on Akaike's criterion, we found 1 co integrating vector for Malaysia meanwhile for Indonesia we found two co

integrating vectors. There are long run relationship between fiscal variables and output in these two countries. It also indicates that fiscal policy will be effective in supporting economic growth. These findings imply that vector error correction should be applied for Granger causality analysis. Granger (1988) points out that if a set of data series is co integrated, it implies statistical causality in at least one direction.

Table 3 summarizes the empirical results of Granger causality based on error correction approach. The finding for Malaysia indicates that there are two unidirectional relationships. A unidirectional from revenue to expenditure supports the tax-and-spend hypothesis. It gives a sign a better management in government finance. Meanwhile, a unidirectional causality from economic growth to government spending indicates a higher demand for public goods and services. Increasing in economic growth also cause a higher government revenue which is dominated by tax. It imply that in the long run, a higher economic growth tend to cause a

lower deficit budget. In short, a prudential expansionary fiscal policy is recommended for supporting the economy activity in a whole. Significance different results are found for Indonesia. There is only unidirectional causality that is economic growth to revenue. A higher growth of economic would cause higher government revenue, but it is not effectively spent on productive sectors. The hypothesis of misallocation resources of government finance may be accepted. It implies a weakness of fiscal management in Indonesia.

Table 3.
Summary of Empirical Granger Causality Test:
Vector Error Correction Model *

Null Hypotheses	Malaysia	Indonesia
DLGE does not Granger Cause DEG	Accepted	Accepted
DEG does not Granger Cause DLGE	Rejected	Accepted
DLREV does not Granger Cause DEG	Accepted	Accepted
DEG does not Granger Cause DLREV	Rejected	Rejected
DLREV does not Granger Cause DLGE	Rejected	Accepted
DLGE does not Granger Cause DLREV	Accepted	Accepted

NOTE: *DLX* is difference level of *X*

* indicates 5 percent level of significances of *F* statistic.

Details about estimations of *ECM* are available based upon request.

SOURCE: Author's estimations.

Table 4.
Cumulative Impulse Responses after five years.

	Response of LGE			Response of LREV			Response of EG		
	LGE	LREV	EG	LGE	LREV	EG	LGE	LREV	EG
Malaysia	0.24	0.12	0.18	0.18	0.15	0.18	0.001	-0.04	0.11
Indonesia	0.18	0.02	0.07	0.18	0.07	0.09	0.001	0.01	0.05

SOURCE: Author's estimation

Table 4 reports the result of analysis of impulse response after five years indicating the direction of the impact of innovation. For Malaysia, the impact of EG on both LGE and LREV are 0.00 and -0.04 respectively, which show a weak relationship. The impact of LREV on LGE is 0.18, indicating a low moderate tax-and-spend effect. The case for Indonesia shows that elasticity of EG on LREV is only 0.01, indicating a low impact of increasing in economic growth on government revenue.

CONCLUSION.

Based upon our study, it can be concluded that there are strongly long run relationship between fiscal variables and output in these two countries. It implies that expansionary fiscal policy is important and effective in supporting the economy in the future. But, more active fiscal policy will have different effect on these two economies. The strongly causal relationship be-

tween fiscal variables and economic growth in Malaysia recommends more expansive fiscal policy, meanwhile the only one unidirectional causal relationship between those in Indonesia implies that more prudential fiscal policy and better bureaucracy have to be applied. In Malaysia, it is belief that more expansive fiscal policy will not cause a budget deficit, but only has moderate effect on output in the long run term. Hence, it can be said that the size of government sector is relatively high comparing to those of the private sector. It also implies that, the government should make a better management on public sector supporting the tax-and-spend fiscal policy. A higher economic growth will also affect a higher demand of public goods and services, which are more effective provided by the government. Indonesia has only very weak effect of fiscal variables in output that recommends to the better government bureaucracy.

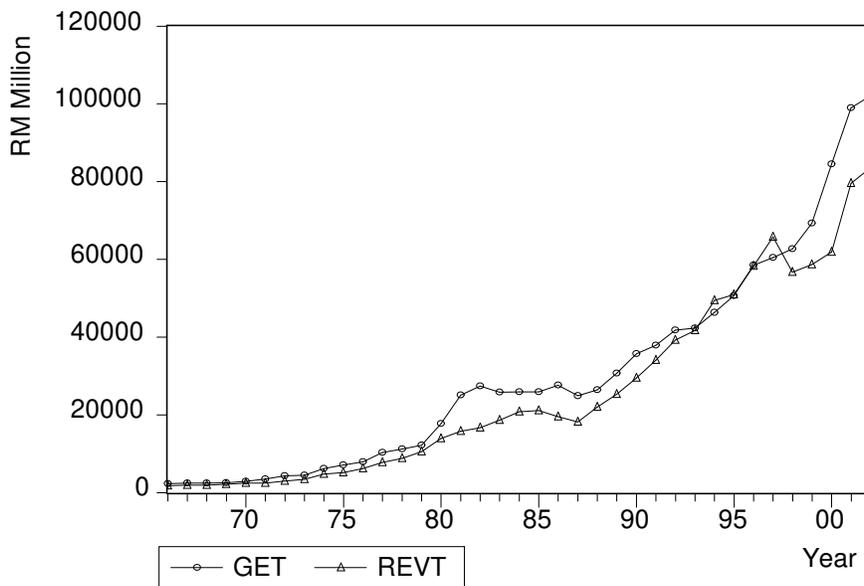
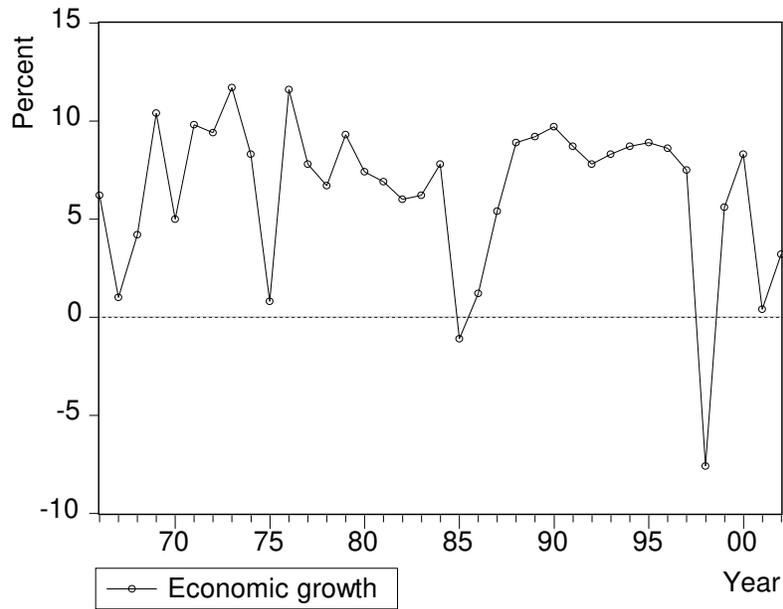
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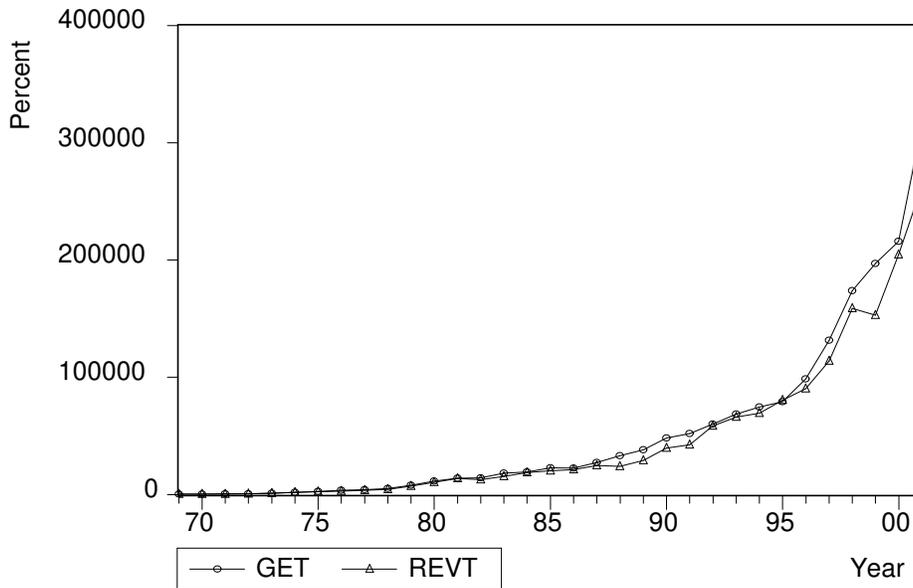
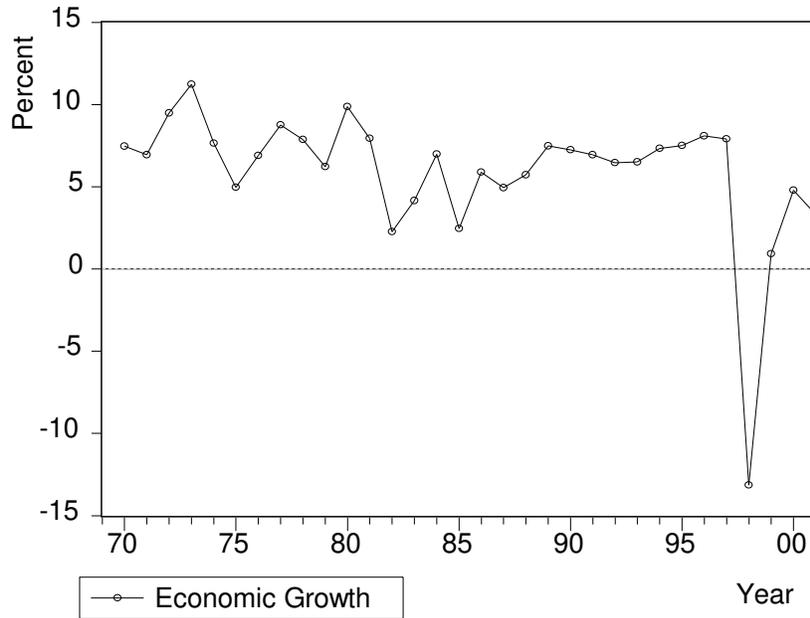
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Appendix 1. The data patterns of Malaysia 1967-2001



GET= Total government expenditure
 REVT= Total revenue

Appendix 2. The data patterns of Indonesia 1969-2001



GET= Total government expenditure
 REVT= Total revenue

Kualalumpur, March 16, 2003.

Kepada Yth:
Pemimpin Redaksi Jurnal Ekonomi Pembangunan
Di
Yogyakarta.

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