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Budget Deficits and Economic Growth in Malaysia: What is the Threshold Level?

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Abstract: Malaysia has been in a budget deficit for over a decade. Deteriorating in its budget deficit has urged the Malaysian government to find measures that could improve the economy performance. Prolonged budget deficits may hinder Malaysia's economic growth and could expose the country to financial and economic instability. Excessive budget deficit could also continue to increase the Malaysian government debts over time. Therefore, determining the optimal budget deficit level is imperative. This paper estimates the threshold levels of Malaysia's budget deficit by examining the relationship between budget deficit and economic growth. Specifically, this paper evaluates the capability of the Malaysian government in managing budget deficit in the long run while remaining solvent using quarterly time-series data spanning over the years between 1990 and 2015. The estimation techniques (OLS, Spline regression technique, and VECM) were employed to ensure the robustness of the results. The findings from the analysis convey a negative long-run relationship between budget deficit and economic growth in Malaysia. The estimation results show the existence of the deficit threshold level of 4% of the GDP in Malaysia. Consequently, a deficit larger than 4% of the GDP would be detrimental to the Malaysia economic growth in the long run. This study amplifies the urgency for fiscal restraint to ensure sustainable economic growth in Malaysia since its budget deficit levels over the years have been higher than 4% of the GDP.

Keywords: *Budget Deficit, Deficit Threshold, Economic Growth, Vector Error Correction Models (VECM), Malaysia*

1. Introduction

Budget deficit can simply be defined as a gap between the flows of government revenues and expenditures in a given calendar year. Accordingly, in the periods when government revenues exceed its expenditures, the budget is in surplus instead of deficit. An increase in budget deficit means that the government needs to increase its demand for 'loanable' funds from the private sector domestically and/or internationally. Economists generally agree countries that continuously run budget deficits may suffer slower growth and are more prone to financial and economic instability. In contrast, accurate fiscal management is a foundation for sustainable prosperity and growth. This is in line with the Neo-Classical argument that persistent high budget deficits are detrimental to economic growth(Bernheim, 1989; Van der Ploeg & Alogoskoufis, 1994). In a different view, the Keynesian paradigm considers budget deficit as a key policy prescription as it could boost aggregate demand. Keynesians argued that an increase in aggregate demand leads to higher investments at any given rate of interest and improves the profitability of private investment (Eisner, 1989). Meanwhile, Ricardian equivalence suggests that budget deficit does not matter except for revenue shocks or smoothening the adjustment of expenditure(Barro, 1974, 1989).

Since it has been recognized as a policy tool for economic growth, the budget deficit has been used extensively in many countries. In the long run, this has increased the government debt of the country. A high budget deficit could also impede economic growth due to the crowding-out effect in the loanable fund market (Irons & Bivens, 2010). Consequently, the sustainability of the budget deficit has become a great concern between policymakers (Bajo-Rubio, Díaz-Roldán, & Esteve, 2004). Numbers of empirical studies have looked at the relationship between budget deficits and economic growth. For example, Mountford and Uhlig (2009), Al-Khedair (1996), Barro (1979), Ahmed and Miller (2000), Ahmad and Rahman (2017) and Gyasi (2020)found a positive relationship between economic growth and budget deficits. The findings of Rahman (2012), Cebula (1995), Huynh (2007), Martin and Fardmanesh (1990), on the other hand, contradicted the previous evidence on the impact of budget deficits on economic growth. Specifically, Huynh (2007)found a negative impact of budget deficit on economic growth in Vietnam. Cebula (1995)noted a negative and insignificant impact of the budget deficit on the economic growth in the USA. Abd Rahman (2012)found no relationship between budget deficit and the long-run economic growth of Malaysia. Findings from Martin and Fardmanesh (1990) showed that the results are country-specific.

Most of the studies on this issue assumed there is a linear relationship between the two variables(Easterly & Rebelo, 1993; Kneller, Bleaney, & Gemmell, 1999). The recent empirical literature on the budget-growth nexus, however, has focused on the non-linear relationships. Focuses are given to determine the level of the deficit that is detrimental to output growth. Adam and Bevan (2005), and Afonso and Jalles (2014), for example, used the fiscal decomposition

method and government budget constraints to analyze the non-linear relationship between the two variables. Using a VAR analysis on a panel dataset, Afonso and Jalles (2014) found countries with deficit exceeding the 3% threshold of the Maastricht criterion could negatively affect economic growth, while positive growth effect for groups of countries with a deficit below the 3% threshold levels. Afonso and Jalles (2014)concluded that nations with lower budget deficits are related to higher and sustainable real GDP growth rates. Adam and Bevan (2005) used government budget constraints to examine the threshold effect of budget deficits on growth for a panel of 45 developing nations. They established evidence of a threshold effect at a level of the deficit of around 1.5% of GDP.

Although it is imperative for the fiscal authorities to reduce the size of the budget deficit and to set up an enabling environment for the private sector to propel economic growth, it is equally important for them to know the level of the deficit that is detrimental to economic growth. Motivated by the argument from Arestis, Cipollini, and Fattouh (2012)hat fiscal authority would only intervene by cutting deficits when they have reached a certain threshold, this paper seeks to detect the threshold level for Malaysia. Specifically, this paper seeks to examine the link between economic growth and the budget deficit for Malaysia and to determine the threshold level of the deficit.

The next section of this paper discusses historical trends of budget deficit in Malaysia. This is followed by a discussion on the bivariate trends of the budget deficit and economic growth of Malaysia. Section 3 provides the methodology of the empirical study and Section 4 presents the empirical results from Ordinary Least Square (OLS) and Vector Error Correction Model (VECM) techniques. The final section provides the conclusion and policy recommendation.

Malaysia: Stylize Facts

Malaysian budget has been in deficit since 1970, with the only exception was between 1993 and 1997 (see, Figure 1). This happened because the Malaysian government expenditure has been rising faster than its revenue. Although the budget deficit is significant to stimulate growth, government expenditure could also reduce development and economic growth if the deficit continued for too large or too long.

In the early 1980s, Malaysia's budget deficit increased due to the commodity crisis. During that period, the Malaysian government has increased its expenditure to boost the economy. From the late 1980s to early 1990s, Malaysia's budget deficit decreased due to economic recovery, supported by rapid growth in the manufacturing sector. This led to a budget surplus during the years 1993-1997 as shown in Figure 1. However, due to the Asian Financial crisis in 1998, Malaysia's budgets

were again in deficit and this situation continued until today. The highest budget deficit recorded by Malaysia was in 2009, which amounted up to RM47,424 million (6.7 % of GDP) during the Global Financial Crisis in 2007 (Ming & Sayed Hossain, 2001).

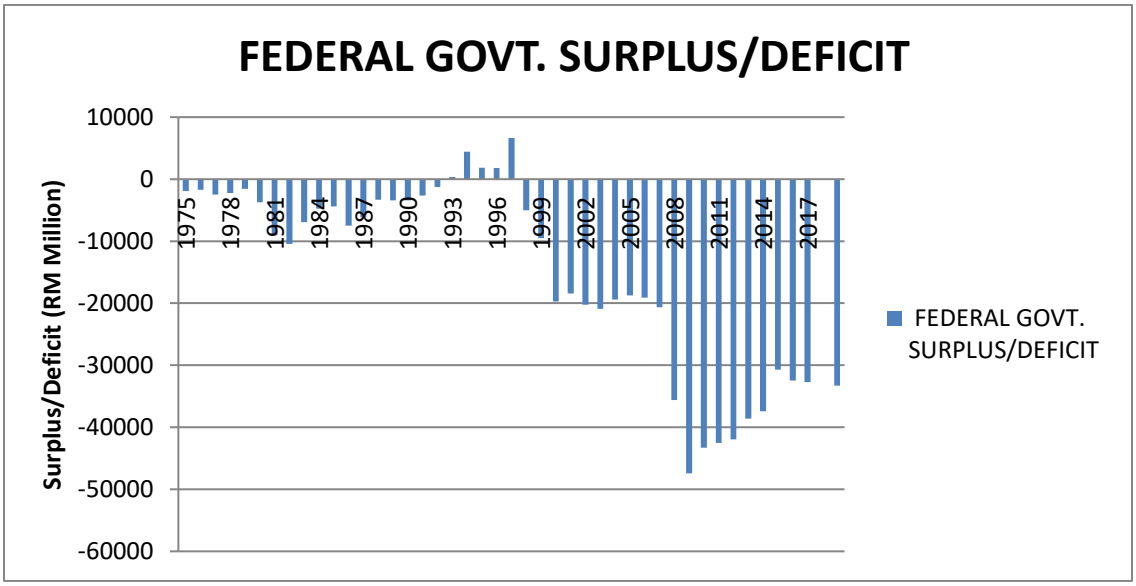

Figure 1: Malaysian budget deficit from 1970-2019

Figure 2 demonstrates the Malaysian budget deficit ratio over real GDP (RGDP) and its economic growth from 1970 to 2015. The graph in Figure 2 shows no clear pattern on the relationship between the two variables. However, the interaction between economic growth and budget deficit can be observed within a certain period. For instance, when the economy had stable growth at an average of 9% during the years 1986 - 1997, Malaysia's budget deficit has steadily improved from deficit to positive balance. At the time when the economy was dealing with a recession in 1998 due to the Asian Financial Crisis, the dramatic decline in the RGDP led to the deterioration of budget balance toward deficit levels. However, Malaysia's budget deficit did not recover from 1999 until 2008,despite RGDP growth were positive at average of 7%, but continued to further decline in year 2009 when the economy faced another recession.

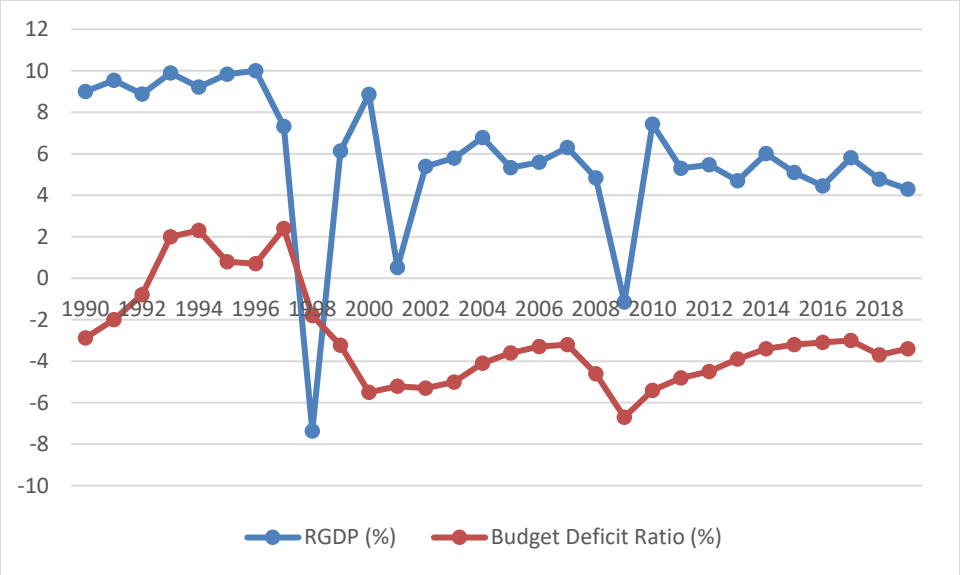

Figure 2: RGDP growth and Budget deficit of Malaysia (1970-2019)

The deterioration of budget deficit propels policymakers to seek alternative measures in order to increase the revenue and to minimize the government expenditure (for example, reducing subsidies) to resolve the budget deficit problem. If such expenditures are not steadily minimized, the budget deficit might worsen, and more borrowings is necessary in order to finance such deficit, thus could increase the national debt to unsustainable levels. Increase in debt level might impact sovereign rating of nation and could increase the borrowing costs for the government. The burden of rising national debt and its maintenance cost will have to be borne by future generations (Easterly & Rebelo, 1993).

Malaysia's fiscal policy recorded the 21 years of deficit and 5 years of surplus over the period 1990-2015. For the 5 years surplus, the average was roughly 1.28% of the GDP while for the 21 years of deficit, the average was 3.93% of the GDP. In terms of output growth, the Box-plots in Figure 3 show that the economic growth during the surplus was more stable and higher in Malaysia. However, the deficit side suggests that running budget deficit can slowdown economic growth.

This study seeks to determine the threshold level of budget deficit for Malaysia based on the approach presented by Khan and Ssnhadji (2001). In determining the threshold level, the initial thresholds (fb^*) ranging from 2% to 8% of GDP have been used.

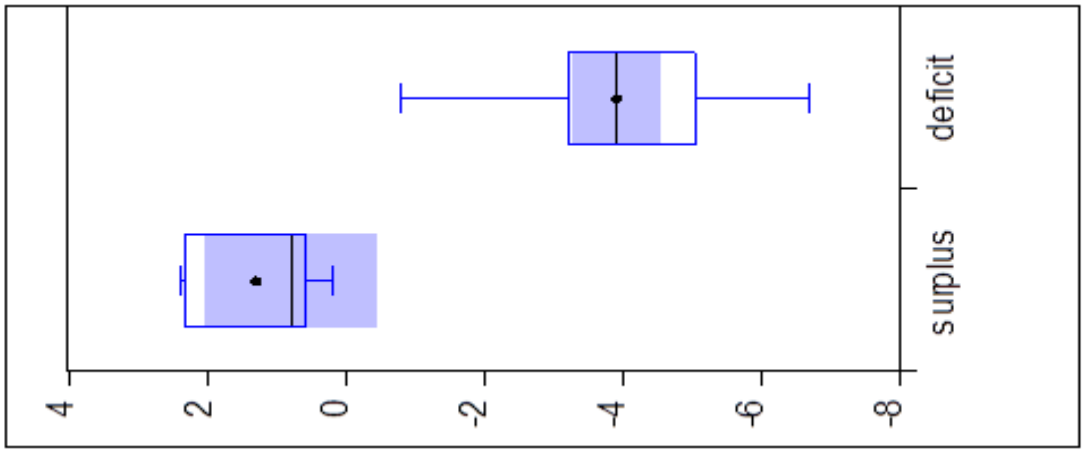

Figure 3: Economic growth during different fiscal regimes in Malaysia (1981-2015)

2. Method

This study uses quarterly data from 1990 - 2015. For the two main variables, real output growth and budget deficit, data were obtained from the database and Thomson Reuters DataStream. The output growth was computed as a change in log of the RGDP. Unlike previous studies, but similar to the study by Akosah (2013), this paper employs additional variables such as, the log of overall government expenditure and the log of government revenue, terms of trade (measured as a ratio of export to import), consumer price index, inflation rate, real interest rate, and nominal exchange rate.

In this paper, a semi-parametric or semi-linear growth regression will be used. This is based on the work of Khan and Ssnhadji (2001) that initially used this technique for threshold analysis of inflation. Using a like technique, the threshold effect of budget deficit on economic growth is estimated using the following equation.

$$\Delta gdp_t = \nu_1 X_{t-i} + \gamma_i fiscal_{t-i} + \delta\rho_j[fb_\pi - fb^*] + \varepsilon_t \quad (1)$$

$$\rho_j = \begin{cases} 1: iffb_\pi > fb^* \\ 0: iffb_\pi \leq fb^* \end{cases} \quad (2)$$

Where, Δgdp_t is the change in logs of the RGDP:X_{t-i} is a vector of controlled variables (consist of inflation to proxy of monetary financing of the deficit by central bank, terms of trade and current account balance to account for external effect on growth, lagged dependent variable to account for initial level of income, and nominal exchange rate);$fiscal_{t-i}$ is a vector of fiscal variables, which

include government expenditure, government revenue and overall fiscal deficit (including divestiture, all scaled by GDP);ρ_j is indicator variable, which is a dummy for the fiscal deficit exceeding a particular level of GDP ratio; while ν_1, γ_i and δ are parameters to be determined. The parameter of interest in this study is δ as it determines the existence of a threshold effect of budget balance on the RGDP growth. Parameter fb^*represent the threshold level for budget deficit ratio, while fb_π represent the budget deficit.

The study further used spline regression technique (Friedman, 1991) by modifying Equation (2) where $\rho_j$contains only binary values. In Equation (3), ρ_j captures the actual deficit levels in the analysis.

$$\rho_j = \begin{cases} fb_\pi : if fb_\pi > fb^* \\ 0 : if fb_\pi \leq fb^* \end{cases} \quad (3)$$

This specification allows for marginal effects of fiscal deficit on growth to differ around a threshold value of the deficit, fb^*(Adam, Cobham, & Kanafani, 2004). The parameter fb^* is determined arbitrarily as recommended by Khan and Ssnhadji (2001) through developing a histogram to find the standard deviation and mean of budget deficit to GDP ratio. This optimal threshold level is determined based on the value of fb^* that reduces the residual sum of the squares (RSS) of the estimated equation.

The study also used spline regression technique in Vector Error Correction Model (VECM) to investigate the threshold effect of budget deficit and public debt on economic growth in Malaysia. For this, the arbitrary threshold parameters are treated as exogenous variable in the VECM model to determine the threshold level that minimizes the residual sum of squares. In addition, the study employed different sets of explanatory variables in the VECM analysis to check the robustness of the OLS estimates. The data are subjected to unit root using Augmented Dickey Fuller (ADF) and Phillip-Perron (PP) test before carrying out the appropriate estimation (Table 1).

Table 1: Stationary properties of the data

Variable	Symbol	Test	Level		First difference	
			Intercept	Intercept &Trend	Intercept	Intercept & Trend
GDP	GDP	ADF	-2.89 [5] (-2.58)	-3.45 [5] (-2.06)	-2.89 [4] (-5.64)**	-3.45 (-6.24)**
		PP	-2.88 [6] (-2.00)	-3.45 [7] (-2.67)	-2.89 [7] (-10.59)**	-3.45 [6] (-10.48)**
GDP growth rate	GDPGR	ADF	-2.89 [9] (-2.48)	-3.45 [9] (-2.74)	-2.89 [12] (-3.45)**	-3.46 [12] (-3.48)**
		PP	-2.88 [4] (-3.36)**	-3.45 [4] (-3.54)**	2.89 [25] (-5.73)**	-3.45 [25] (-5.67)**
Capital expenditure	CAE	ADF	-2.88 [0] (-3.91)**	-3.45 [0] (-3.93)**	-2.89 [0] (-10.04)**	-3.45 [0] (-9.99)**
		PP	-2.88 [4] (-4.13)*	-3.45 [3] (-4.22)**	-2.89 [9] (-10.74)**	-3.45 [9] (-10.67)**
Budget deficit	BD	ADF	-2.89 [4] (-1.17)	-3.45 [3] (-3.34)	-2.89 [3] (-11.25)**	-3.45 [3] (-11.21)**
		PP	-2.88 [8] (-9.05)**	-3.45 [8] (-10.09)**	-2.89 [9] (-28.89)**	-3.45 [9] (-28.79)**
Government revenue	GR	ADF	-2.89 [9] -2.28	-3.45 [9] (-2.25)	-2.89 [8] (-3.00)**	-3.45 [8] (-3.05)
		PP	-2.88 [7] (-2.33)	-3.45 [7] (-2.26)	-2.89 [61] (-5.62)**	-3.45 [63] (-5.97)**
Government expenditure	GE	ADF	-2.89 [9] (-2.71)	3.45 [9] (-3.09)	-2.89 [8] (-3.26)**	-3.45 [8] (-3.49)**
		PP	-2.88 [2] (-2.63)	-3.45 [2] (-2.95)	-2.89 [23] (-5.18)**	-3.45 [22] (-5.14)**
Term of trade	TT	ADF	-2.89 [2] (-1.38)	-3.45 [0] (-5.47)**	-2.89 [1] (-11.39)**	-3.45 [1] (-11.34)**
		PP	-2.88 [3] (-1.68)	-3.45 [6] (-5.85)**	-2.89 [33] (-24.65)**	-3.45 [36] (-25.48)**
Interest rate	IR	ADF	-2.89 [12] (-1.30)	-3.45 [12] (0.12)	-2.89 [12] (-3.16)**	-3.15 [12] (-3.41)**
		PP	-2.88 [30] (-2.85)	-3.45 [32] (-2.49)	-3.89 [35] (-7.46)**	-3.45 [35] (-7.56)**
Consumer price index	CPI	ADF	-2.88 [0] (-1.95)	-3.45 [0] (-2.43)	-2.89 [0] (-8.42)**	-3.45 [0] (-8.58)**
		PP	-2.88 [4] (-2.00)	-3.45 [4] (-2.43)	-2.89 [1] (-8.44)**	-3.45 [4] (-8.47)**
Exchange rate	ER	ADF	-2.89 [1] (-1.43)	-3.45 [1] (-2.53)	-2.89 [0] (-7.06)**	-3.45 [0] (-7.06)**
		PP	-2.88 [3] (-1.16)	3.45 [4] (-2.27)	-2.89 [1] (-7.12)**	-3.45 [1] (-7.11)**

Note: ** significance at 5%. Figure in () is critical value. Figure in [ ] is lag length for ADF and bandwidth for PP test. Critical values for 5% is -2.889 for intercept analysis, while -3.454 is for intercept and trend analysis. All data are in logarithm. ***Source:*** Author's findings

3. Findings and Discussions

Multivariate co-integration analysis

The analysis begins with examining the long-run relationship between the GDP growth and the variables studied. For this purpose, the Johansen co-integration tests were conducted on four multivariate Vector Autoregressive (VAR) models as presented in Table 2. In the first multivariate VAR model (Panel A), the regression consists of the variables: GDP growth, budget deficit, interest rate, consumer price index, exchange rate and terms of trade. The trace tests show that there is one cointegration vector between the variables. The result suggests there is a long-run co-movement between these variables. In contrast, the maximum eigenvalue suggests there is no vector of cointegration.

Table 2: Result from multivariate cointegration tests

Variables	H_0	Trace Statistic	%5 Critical Value	Maximum Eigenvalue	%5 Critical Value	Conclusion
$\Delta GDPGR$, ΔBD, ΔIR, ΔCPI, ΔER, ΔTT	$r = 0$	**94.81****	94.14	33.76	39.37	Trace test indicates 1 cointegrating equation at 0.05 significant levels
	$r \leq 1$	61.04	68.52	29.95	33.46	
	$r \leq 2$	31.09	47.21	13.59	27.07	
	$r \leq 3$	17.49	29.68	12.31	20.97	
	$r \leq 4$	5.17	15.41	4.38	14.07	
	$r \leq 5$	0.78	3.76	0.78	3.76	

Note: * Significant at 5%. **Significant at 1%

Source: Author's findings

Threshold level of budget deficit

The results from the Ordinary Least Square (OLS) estimation with the different values of initial threshold level are presented in Table 3. Based on the initial arbitrary threshold levels, a total of eight equations have been estimated. The estimation results show that there is a positive effect of fiscal balance on output growth in all models with different initial threshold values ranging from 2% to 8%. The results suggest that budget deficit (surplus) tend to raise (decrease) economic growth.

With regards to the threshold effect, Model 4 with the threshold level higher than 4% of GDP outperformed all other models in terms of selection creation suggested by Khan and Ssnhadji

(2001). The model has the lowest residual sum of squares, AIC and SBC and passed the entire diagnostic test at 5% significant level. This finding indicates that there is a threshold level for budget deficit in Malaysia, where deficit above this threshold could reduce the economic growth. Based on the estimation results, the deficit threshold for the sample period is 4% of GDP. Therefore, budget deficit higher than 4% of GDP could be detrimental to Malaysia's economic growth.

Table 3: Threshold Estimations from a series of OLS regression

Variable	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Intercept	38.814 [0.851]	35.582 [0.792]	41.988 [0.952]	41.755 [0.935]	40.709 [0.895]	41.944 [0.935]	42.156 [0.951]
Δ fiscal balance$_t$	0.334 [0.991]	0.366 [1.095]	0.348 [1.059]	0.391 [1.167]	0.339 [0.998]	0.331 [0.991]	0.318 [0.961]
Δ fiscal balance$_{t-1}$	-0.346 [-0.635]	-0.372 [-0.690]	-0.301 [-0.567]	-0.395 [-0.734]	-0.351 [-0.639]	-0.313 [-0.581]	-0.306 [-0.574]
Δ fiscal balance$_{t-2}$	0.914 [1.683]	0.896 [1.673]	0.608 [1.122]	0.797 [1.485]	0.876 [1.616]	0.822 [1.526]	0.909 [1.713]
Δ fiscal balance$_{t-3}$	-0.752 [-2.229]*	-0.709 [-2.123]*	-0.499 [-1.441]	-0.625 [-1.835]	-0.717 [-2.099]*	-0.682 [-2.020]*	-0.767 [-2.320]*
Budget deficit > 2% GDP	-0.534 [-0.732]						
Budget deficit > 3% GDP		-0.786 [-1.612]					
Budget deficit > 4% GDP			**0.505** **[2.254]***				
Budget deficit > 5% GDP				0.307 [1.690]			
Budget deficit > 6% GDP					0.098 [0.574]		
Budget deficit > 7% GDP						0.230 [1.424]	
Budget deficit > 8% GDP							0.310 [2.041]*
Δ GDP$_{t-1}$	0.815 [12.148]*	0.816 [12.309]*	0.815 [12.468]*	0.814 [12.303]*	0.816 [12.118]*	0.821 [12.304]*	0.808 [12.303]*
Δ GDP$_{t-3}$	-0.253 [-2.507]*	-0.275 [-2.748]*	-0.220 [-2.291]*	-0.233 [-2.410]*	-0.239 [-2.428]*	-0.255 [-2.597]*	-0.255 [-2.634]*
ΔCPI$_{t-1}$	-1.094 [-0.188]	-2.366 [-0.408]	-2.169 [-0.382]	-0.798 [-0.139]	-0.797 [-0.137]	-0.345 [-0.060]	-0.925 [-0.163]
ΔERt-2	-2.130 [-0.395]	-2.130 [-0.403]	-5.430 [-1.019]	-3.705 [-0.701]	-2.991 [-0.560]	-3.690 [-0.694]	-4.553 [-0.860]
ΔTT$_{t-2}$	-4.587 [-0.356]	-2.622 [-0.205]	-0.837 [-0.066]	-3.861 [-0.303]	-4.405 [-0.340]	-4.325 [-0.338]	-2.846 -0.225]
ΔIR$_{t-1}$	0.139	0.132	0.187	0.179	0.170	0.185	0.177

	[0.803]	[0.777]	[1.124]	[1.061]	[0.993]	[1.090]	[1.057]
R-squared	0.741	0.747	**0.754**	0.747	0.740	0.745	0.751
S.E. of regression	3.610	3.569	**3.521**	3.564	3.614	3.580	3.538
Sum Squared residual	1147.110	1120.986	**1091.102**	1117.821	1149.799	1128.098	1101.922
Akaike info criterion	5.518	5.495	**5.467**	5.491	5.520	5.501	5.477
Schwarz criterion	5.830	5.807	**5.780**	5.804	5.832	5.814	5.790
Durbin-Watson stat	1.723	1.782	**1.778**	1.724	1.727	1.737	1.752
Log likelihood	-263.885	-262.733	**-261.382**	-262.592	-264.002	-263.050	-261.876
F-statistic	22.924	23.644	**24.511**	23.734	22.851	23.444	24.191
Jacque-Bera Normality Test	1.848	1.290	0.791	0.968	1.278	1.130	0.980
Breusch-Godfrey Serial correlation LM test	0.159	0.191	0.062	0.052	0.097	0.112	0.147
White Heteroskedasticity test	0.797	0.821	0.907	0.973	0.965	0.985	0.978
ARCH Test	0.887	0.802	0.514	0.644	0.712	0.599	0.395

Note: [ ] indicates t-statistics. *Significant at 5%.

Source: Author's findings

Further analysis has been carried out using the spline regression technique to assess the robustness of the OLS results. In this regression, all range of threshold levels of *fb** (between 2% and 8% of GDP) that are included in the OLS model are also include in the spline regression. In this regression, *fb** becomes significant in the model to determine the threshold level. Table 4 shows that all indicators are insignificant except for *fb**> 4% of the GDP. This finding reconfirms the result from OLS that the budget deficit threshold level to economic growth in Malaysia is 4% of the GDP.

This paper also checks the robustness of OLS result using long-run analysis with VECM (Vector Error Correction Model). In the estimation process, the actual budget deficit at each threshold level was included in the VECM as an exogenous variable. The result of threshold effects from the VECM estimation is consistent with the result obtained from OLS method. The results of VECM (Table 4) show that the threshold level of *fb**> 4% of GDP outperformed all other models. Model 4 is the model with lowest residual sum of squares, AIC, and SBC values. This confirms the earlier result that Malaysia deficit threshold level of 4% of GDP. Below the 4% threshold level, economic growth responds positively to any increase in budget deficit. Beyond this threshold level, any increase in budget deficit will be detrimental to the economic growth.

Table 4: Threshold estimations from VECM with Spline Regression Technique

Error Correction model:							
	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Adjustment Coefficients	-0.374 [-6.347]*	-0.569 [-7.005]*	-0.503 [-5.847]*	-0.303 [-4.217]*	-0.438 [-5.593]*	-0.349 [-4.899]*	-0.166 [-2.443]*
$GDPGR_{t-1}$	0.470 [5.668]*	0.576 [6.767]*	0.450 [5.157]*	0.422 [4.577]*	0.519 [5.702]*	0.475 [5.174]*	0.416 [4.073]*
CAE_{t-1}	-0.040 [-0.145]	-0.024 [-0.090]	0.265 [0.978]	0.397 [1.381]	0.316 [1.158]	0.356 [1.265]	0.475 [1.550]
GR_{t-1}	0.152 [0.207]	0.586 [0.818]	0.397 [0.519]	0.255 [0.275]	0.431 [0.556]	0.294 [0.370]	-0.138 [-0.160]
IR_{t-1}	-0.292 [-1.382]	-.0525 [-2.404]*	-0.494 [-2.081]*	-0.275 [-1.114]	-0.509 [-2.114]*	-0.404 [-1.652]	0.010 [0.044]
Intercept	-0.139 [-0.394]	-0.092 [-0.268]	-0.109 [-0.297]	-0.121 [-0.309]	-0.099 [-0.267]	-0.113 [-0.296]	-0.152 [-0.366]
Fiscal deficit > 2% GDP	-3.029 [-5.269]						
Fiscal deficit > 3% GDP		-1.363 [-3.915]					
Fiscal deficit > 4% GDP			**-0.590 [-3.296]***				
Fiscal deficit > 5% GDP				-0.583 [-3.333]			
Fiscal deficit > 6% GDP					-0.516 [-3.522]		
Fiscal deficit > 7% GDP						-0.478 [-3.497]	
Fiscal deficit > 8% GDP							-0.255 [-1.565]
R-squared	0.428	0.381	**0.462**	0.294	0.367	0.329	0.208
Sum Sq. residual	1140.972	1233.615	**1073.175**	1408.651	1262.201	1337.728	1580.194
F-statistic	11.730	9.672	**13.461**	6.524	9.098	7.700	4.115
Log likelihood	-265.750	-269.963	**-262.657**	-276.393	-270.850	-273.785	-282.197
Akaik AIC	5.401	5.479	**5.339**	5.611	5.501	5.560	5.726
Schwarz criterion	5.582	5.660	**5.521**	5.793	5.683	5.741	5.907

Note: [ ] indicates t-statistics. * Significant at 5%.

Source: Author's findings

Based on the estimation result, this study concludes that there is a threshold level for budget deficit in Malaysia. This study found the threshold level for Malaysia budget deficit is at 4% of the GDP. Thus, a deficit level that is higher than 4% of the GDP is detrimental to Malaysia's economic growth. This implies that the Malaysian fiscal policy has continuously slowed down the economy as Malaysian budget deficit levels over the years have been higher than 4% of GDP.

Based on the estimated threshold level, Figure 4 shows that during the study period (1990-2015), there were three periods where the deficit is higher than the 4% threshold levels, i.e. 1990-2000, 2006-2008, and 2014-2015.

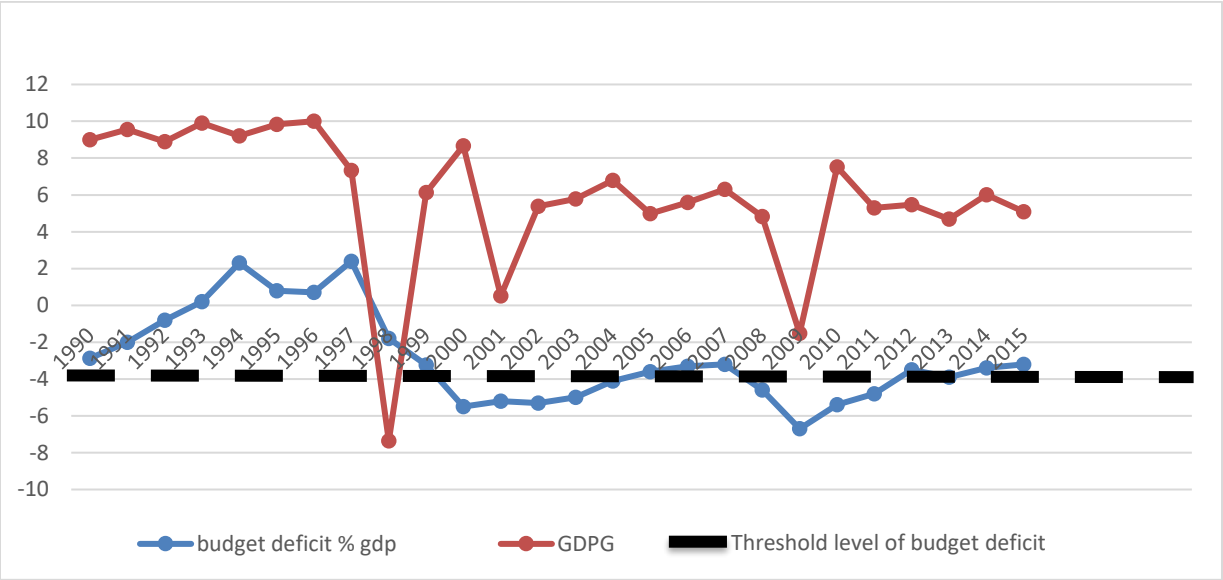

Figure 4: Malaysia budget deficit Vs the threshold level

4. Conclusion

This study examined the link between economic growth and budget deficit in Malaysia using quarterly data from 1990 to 2015. Following the work of Khan and Ssnhadji (2001), this study used both Ordinary Least Square (OLS) for short-run dynamic and VECM for long-run analysis, incorporating spline regression techniques in both methods. The result shows the existence of the deficit threshold level of 4% of GDP in the case of Malaysia for the sample period. The result was robust due to the various econometric techniques and model specifications adopted in this study. The findings from this study suggest that a deficit level below 4% of the GDP would stimulate stable economic growth for Malaysia, while a deficit higher than 4% of the GDP would be detrimental to the long-run economic growth. Based on Malaysia's budget deficit figure and the threshold level, we can conclude the situation for Malaysia; whether the current budget deficit is already detrimental to the growth or whether Malaysia's budget deficit is still too low for it to negatively affect the growth of the economy. This study amplifies the urgency for fiscal restraint to ensure sustainable economic growth in Malaysia.

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