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EXTERNAL BALANCE AND BUDGET IN MALAYSIA

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ABSTRACT

This study examines external balance and budget in Malaysia. The unit root test results show that the variables examined are a mixture of stationary and non-stationary variables. The bounds testing results show that there is a long-run relationship between external balance and its determinants, including budget, and also between budget and its determinants, including external balance. Moreover, the results of the causality analysis show that the current account targeting hypothesis and the Ricardian equivalence hypothesis dominate the relationship between external balance and budget. Short-run and long-run measures are needed to address external imbalances. A healthy external balance is important for sustainable economic growth.

Keywords: external balance, budget, Malaysia, causality

INTRODUCTION

Malaysia is a small open economy, and its economic growth is strongly influenced by the performance of the global economy. Malaysia had been achieving rapid economic growth, especially during the period from 1988 to 1996. However, its economic growth slowed down after the Asian Financial crisis in 1997–1998 and during the global economic slowdown in 2008. The economic growth rate of Malaysia is unimpressive compared to the economic growth rate of Malaysia before the Asian financial crisis, that is, during the period from 1988 to 1996. The average economic growth rate (2000 = 100) of Malaysia during 2009–2011 was 3.5%, while the average economic growth rate (2000 = 100) from 1988 to 1996 was 9.1% (International Monetary Fund [IMF], 2012). Sluggish global economic growth, particularly in the developed countries, has led to a series of budget deficits in Malaysia with the aim being to stimulate economic growth. Consolidated public sector finance in Malaysia produced deficits of RM 41,685 million, RM 51,512 million, RM 15,810 million and RM 91,555 million for the years 2008, 2009, 2010 and 2011, respectively (Ministry of Finance Malaysia [MOF], 2012). In 2008, the balance of payments deficit in Malaysia was RM 18,250 million. However, in 2009 and 2010, Malaysia experienced balance of payments surpluses of RM 13,831 and

RM 2,628 million, respectively. In 2011, Malaysia experienced a balance of payments deficit of RM 94,682 million (MOF, 2010, 2011, 2012). External deficit can be bad or good. External deficit is bad, for example, because financial regulation fails to fuel credit booms and misbehaviour of government leads to reduced national saving. External deficit is good, for example, because international borrowing and lending allow for inter-temporal trade, which increases welfare (Blanchard & Milesi-Ferretti, 2012, p. 140).

External imbalances and budget deficits have led to renewed interest in the twin deficits hypothesis (Theofilakou & Stournaras, 2012, pp. 719–720). This issue gained much attention in the 1980s, especially in the United States (US) when the US experienced significant external and budget deficits. The twin deficits hypothesis states that a budget deficit causes an external deficit. The Mundell and Fleming theory postulates that an increase in the budget deficit will lead to an increase in the real interest rate in the domestic country, which will attract capital inflows. This will cause exchange rates to rise, which will make exports less competitive and lead to more imports. Thus, there will be a current account deficit under a flexible exchange rate regime. Alternatively, the Keynesian absorption theory asserts that an increase in the budget deficit will lead to an increase in the domestic absorption and therefore will induce more imports in the economy, leading to a current account deficit (Algieri, 2013, p. 3). In practice, studies of the twin deficits hypothesis have produced different results for different countries (Algieri, 2013, p. 1; Chihi & Normandin, 2013).

This study investigates the impact of budget on external balance in Malaysia over the period from 1980 to 2011. More specifically, this study examines the impacts of consolidated public sector finance and federal government finance on balance of trade, balance of services, balance of current account and balance of payments in Malaysia. The impact of budget could be different for different sub-categories of balance of payments due to different goods and services elasticities. The previous studies mainly focused on the impact of budget on balance of trade or balance of current account (Kalou & Paleologou, 2012). There have been very few studies that examine the impact of budget deficit on goods and services balances under the structural break and also investigate the relationship between balance of payments and budget deficit, especially for Malaysia. The autoregressive distributed lag (ARDL) approach of Pesaran, Shin, and Smith (2001) is used. The approach is suitable regardless whether all regressors examined are integrated of the same order, that is integrated of order one (I[1]), integrated of order zero (I[0]) or a mixture of I(1) and I(0) variables. Moreover, this study considers the structural break in the examination of causality.

LITERATURE REVIEW

There is a large literature on the relationship between external balance and budget deficit (Kouassi, Mougoue, & Kymn, 2004; Rafiq, 2010; Campa & Gavilan, 2011; Jinjarak & Sheffrin, 2011; Blanchard & Milesi-Ferretti, 2012; Kalou & Paleologou, 2012; Mussa, 2012; Theofilakou & Stournaras, 2012; Nag & Mukherjee, 2012; Chihi & Normandin, 2013; Hoffmann, 2013; Trachanas & Katrakilidis, 2013). However, there is no consensus on the relationship between external balance and budget deficit. Some studies have found that budget deficit causes external deficit. Baharumshah and Lau (2007) investigate the relationship between current account deficit and budget deficit in Thailand using four variables in a vector autoregressive (VAR) model using quarterly data for the period from 1976:QI to 2001:QIV. The variables employed in the study are: current account as a ratio of gross domestic product (GDP), budget deficit as a ratio of GDP, the nominal interest rate and the nominal exchange rate, which is the Thai baht against the US dollar. The results show that there is a long-term relationship among the variables. Budget deficit is found to cause current account deficit and not the reverse. More specifically, an increase in the budget deficit will lead to an increase in the nominal interest rate, and this will appreciate the nominal exchange rate and thus produce a current account deficit. The results of the generalised variance decomposition demonstrate that the nominal exchange rate is the most exogenous variable, and the nominal interest rate is influenced by budget deficit. An increase in the nominal interest rate will displace private investment. In other research, Chihi and Normandin (2013) assess the link between external balance and budget deficit balances in 24 developing countries in Africa, the Americas, Asia and Oceania. The variables studied are the US real treasury bills rate, terms of trade, the real effective exchange rate, GDP divided by consumer price index (CPI), government expenditure as a ratio of GDP, tax as a ratio of GDP and household expenditure as a ratio of GDP. The results show that in twelve of the countries examined, there is a positive relationship between external balance and budget deficit. The domestic resources net of public absorptions are the most important factors explaining the positive relationship between the external deficit and budget deficit for most countries. Budget deficit can influence external deficit and vice versa.

Rafiq (2010) examines the interaction between budget deficits, current account balances and real exchange rates in the United Kingdom (UK) and US in a time-varying VAR model, which allows for time variation in the stochastic variance and autoregressive parameters, over the period from 1973:QI to 2008:QIV for the UK and from 1973:QI to 2009:QI for the US. The results show that budget deficit reduces the US current account balance. For the UK, budget deficit improved current account balance. However, the impacts of budget deficits on the UK and the US current account balances have fallen in magnitude

over the past 20 years. The time-varying variance decomposition results reveal that budget deficit shocks played a key role in driving the UK current account and the real exchange rate fluctuations. However, budget deficit shocks have been a marginal factor in the variation of the US current account and the exchange rate fluctuations. The common finding for the UK and the US is that budget deficit reductions alone cannot eliminate current account imbalances. In contrast to the UK, the findings regarding the US support the view of using depreciation of the real exchange rate to correct current account imbalance.

There are some studies that found no relationship between external balance and budget. Algieri (2013) analyses the relationships between external balances, namely trade balances, current account balances and budget balances in Greece, Ireland, Italy, Portugal and Spain using quarterly data from the period 1980:QII to 2012:QII. The study uses the Granger causality test and the Toda and Yamamoto causality test. The variables used in the study are government balance as a ratio of GDP and current account balance or trade balance as a ratio of GDP. The results reveal that both tests produce the same conclusion and support the Ricardian equivalence hypothesis; more specifically, there is no nexus between current account deficit or trade balance deficit and budget deficit. This implies that a reduction in budget deficit may not help reduce external deficits. This is because a budget deficit will lead to inter-temporal reallocation of savings and thus there will be no effect on the interest rate or exchange rate. Therefore there is no effect on the external balance. Rational agents will learn that budget deficit today will lead to increases in taxes in the future. Consequently, the rational agents will save more today to pay more tax in the future (Algieri, 2013). The nexus between budget deficit and external deficit is more complex than the twin deficits hypothesis. There are many factors that can influence external imbalance, such as an internal devaluation policy to reduce external balance and improvements in the competitiveness of tradable goods and services through increases in productivity and quality (Algieri, 2013, p. 9).

Some studies found that external deficit causes budget deficit. Kalou and Paleologou (2012) re-examine the twin deficits hypothesis in a vector error correction model (VECM) including the endogenous determination of structural breaks to determine the causal relationship between budget deficit and current account deficit in Greece using annual data over the period from 1960 to 2007. The variables analysed are budget deficit as a ratio of GDP, current account balance as a ratio of GDP, the 12-month Treasury bill rate and the nominal effective exchange rate. The two deficits are found to be positively related and the direction of causality is from current account to budget deficit. In other words, the results support the current account targeting hypothesis. The hypothesis affirms that current account deficit induces slower economic growth, and subsequently government implements a budget deficit to stimulate economic

growth in the hope of reducing the current account deficit. This is true for small open economies that strongly depend on capital inflows. In a small open economy, interest rates are exogenous and long-term causality is expected to run from interest rates to current account. In a large economy, interest rates are determined by the budget deficit (Kalou & Paleologou, 2012, p. 233). In the presence of a growing debt to GDP ratio, domestic developments will be restrained by the foreign balance. Therefore, tax reforms to curb tax evasion and structural reforms in the financial and labour markets are necessary (Kalou & Paleologou, 2012, p. 239).

DATA AND METHODOLOGY

The two budgets used are consolidated public sector finance (bd_{1t}) and federal government finance (bd_{2t}), which are both expressed as a ratio of GDP. Consolidated public sector finance includes federal government finance, state governments' finances, local authorities' finances and statutory bodies' finances (MOF, 2012, p. 741). The use of the two budgets is to verify the impacts of those budgets on external balances. Balance of trade (bt_t), balance of services (bs_t), balance of current account (bca_t) and balance of payments (bop_t) are also all expressed as a ratio of GDP. The real interest rate (r_t) is expressed as $r_t = tb_t - \pi_t$, where tb_t is the 3 months treasury bill rate in Malaysia and π_t is the inflation in Malaysia. The inflation in Malaysia is calculated as $\pi_t = [(cpi_t - cpi_{t-1}) / cpi_{t-1}] \times 100$, where cpi_t is CPI (2000 = 100) in Malaysia. The real exchange rate (rer_t) is expressed by the real effective exchange rate of Malaysia (2000 = 100). The real stock price return (rsp_t) is expressed as $rsp_t = (sp_t / sp_{t-1}) - 1$, where sp_t is the stock price (2000 = 100) in Malaysia divided by CPI in Malaysia. The sample period of this study is from 1980 to 2011. The budget and balance of payments data were obtained from various issues of *Economic Report*, published by MOF, and the rest of the data were obtained from *International Financial Statistics*, available from the IMF.

Figure 1 displays the plots of external balances, and Figure 2 displays the plots of budgets. Generally, balance of trade, balance of services, balance of current account and balance of payments fluctuated closely before the Asian financial crisis in 1997–1998. However, those series diverged after the crisis. The standard deviations of the series from 1980 to 1996 were small, namely 5,014.7, 4,339.7, 7,145.1 and 8,437.7, respectively. The standard deviations increased from 1997 to 2011, namely 41,355.5, 10,077.6, 39,297.7 and 32,485.3, respectively. Consolidated public sector finance and federal government finance fluctuated closely with an upward trend towards zero before the Asian financial

crisis. Those series exhibited a high degree of fluctuation after the crisis. Consolidated public sector finance and federal government finance were strongly positively correlated over the period from 1980 to 2011; that is, the coefficient of correlation was 0.7, which is significant at the 1% level.

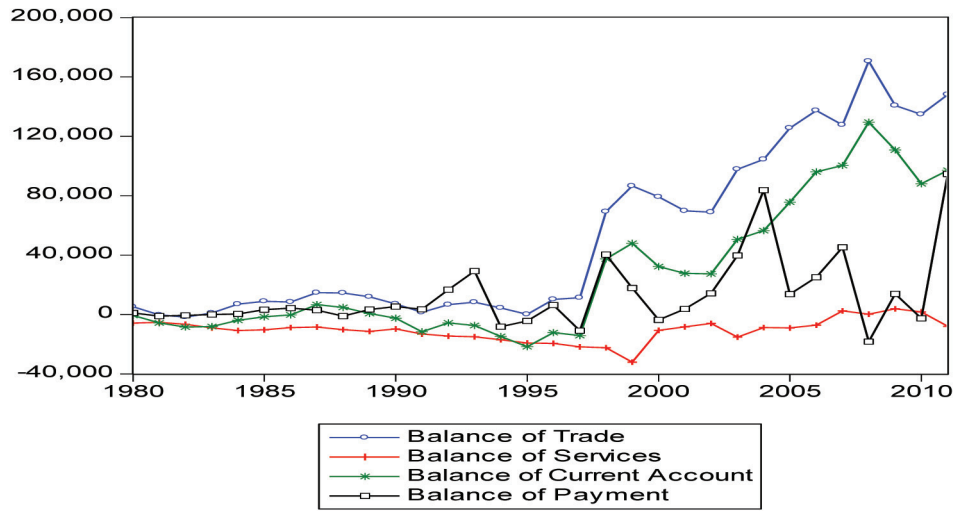

Figure 1. The plots of balance of trade, balance of services, balance of current account and balance of payments in Malaysia, 1980–2011 (RM million)

Source: MOF, 2013

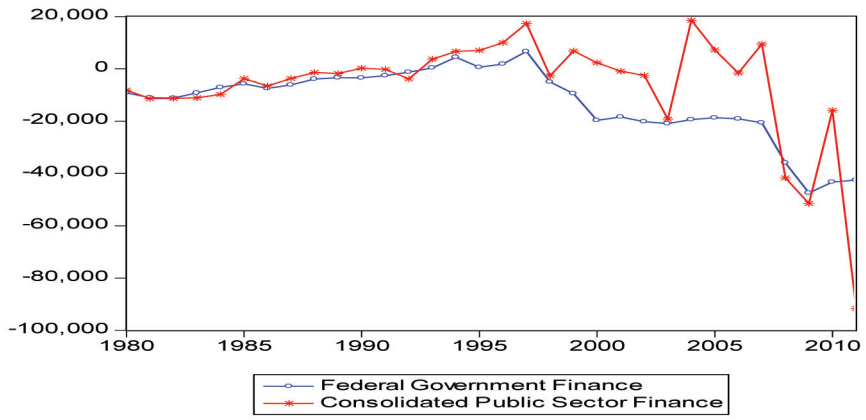

Figure 2. The plots of consolidated public sector finance and federal government finance in Malaysia, 1980–2011 (RM million)

Source: Various issues of Economic Report, MOF

Consolidated public sector finance and federal government finance were negatively correlated with balance of trade, balance of services, balance of current account and balance of payments. The correlation coefficients were high between consolidated public sector finance and federal government finance with balance of trade (–0.45, –0.85) and balance of current account (–0.5, –0.87), but relatively low with balance of services (–0.42, –0.67) and balance of payments (–0.3, –0.34) (Table 1). This implies that budgets have a stronger impact on balance of trade and balance of current account then on balance of services and balance of payments.

Table 1
The coefficients of correlation of consolidated public sector finance or federal government finance with balance of trade, balance of services, balance of current account and balance of payments, respectively, 1980–2011 (RM million)

	bd_{1t}	bt_t	bs_t	bca_t	bop_t
bd_{1t}	1.00				
bt_t	–0.45	1.00			
bs_t	–0.42	0.40	1.00		
bca_t	–0.50	0.98	0.50	1.00	
bop_t	–0.30	0.45	0.00	0.42	1.00

	bd_{2t}	bt_t	bs_t	bca_t	bop_t
bd_{2t}	1.00				
bt_t	–0.85	1.00			
bs_t	–0.67	0.40	1.00		
bca_t	–0.87	0.98	0.50	1.00	
bop_t	–0.34	0.45	0.00	0.42	1.00

Note: bd_{1t} denotes consolidated public sector finance while bd_{2t} denotes federal government finance.
Source: Various issues of *Economic Report*, MOF.

The relationship between current account deficit and budget deficit can be shown using the national account identity:

$$y_t = c_t + i_t + g_t + (x_t - m_t) \tag{1}$$

where y_t is GDP, c_t is private consumption, i_t is investment, g_t is government consumption, x_t is exports and m_t is imports. Equation (1) can be rewritten in terms of the external sector (x_t - m_t) as follows:

$$(x_t - m_t) = y_t - c_t - i_t - g_t \tag{2}$$

The national saving (s_t) is equal to $y_t - c_t - g_t$ and thus equation (2) can be written as follows:

$$(x_t - m_t) = s_t - i_t \tag{3}$$

The national saving can be divided into government saving (s_g) and private saving (s_p). Government saving can be defined as ($t_t - g_t$), where t_t is tax and g_t is government consumption. When ($t_t - g_t$) is positive, government experiences a budget surplus. When ($t_t - g_t$) is negative, government experiences a budget deficit. Equation (3) can be written as follows:

$$(x_t - m_t) = s_p + (t_t - g_t) - i_t \tag{4}$$

or

$$(x_t - m_t) = s_p - i_t + bd_t \tag{5}$$

where bd_t is budget deficit. When ($x_t - m_t$) is negative, it implies a deficit while when ($x_t - m_t$) is positive, it implies a surplus. When ($x_t - m_t$) is negative, a country can finance the external sector through borrowing from abroad. In other words, the country is importing present consumption and exporting future consumption. The ($s_p - i_t$) is the private saving and investment balance. If the private saving and investment are about the same or constant, then external balance ($x_t - m_t$) and government balance (bd_t) and will move closely together. If a change in budget deficit is offset by change in saving, that is called the Ricardian equivalence hypothesis, which postulates that budget and current account are unrelated (Algieri, 2013, pp. 3–5). An inter-temporal shift between taxes and budget deficits does not matter for the real interest rate and investment or current account balance. This means that government deficits are neutral and the twin deficits only happen coincidently. The factors that influence current account are factors such as the response of consumption to various shocks to the economy (Kalou & Paleologou, 2012, p. 233).

Given that private saving and investment depend on the interest rate (ir_t), the exchange rate (ex_t) and the stock return (sr_t), equation (5) can be rewritten as follows (Kalou & Paleologou, 2012, p. 232):

$$(x_t - m_t) = s_p(ir_t, ex_t, sr_t) - i_t(ir_t, ex_t, sr_t) + bd_t \tag{6}$$

The Zivot and Andrews (1992) (ZA) and Lee and Strazicich (2004) (LS) unit root test statistics are used to examine the stationarity of the data. The use of the conventional unit root test statistics can lead to the wrong conclusion about the stationarity of the data if structural breaks exist in the data. The ZA unit root test statistic is an augmented Dickey-Fuller type endogenous break unit root test. The LS unit root test statistics are an endogenous unit root test for one or two

structural breaks that is unaffected by structural breaks under the null and alternative hypotheses, and thus, spurious rejection will not occur. The LS unit root test statistics are based on the Lagrange Multiplier test.

When the variables in equation (6) are co-integrated, causality will be tested in the VECM as follows:

$$\Delta b_t = \beta_{10} + \beta_{11} D_t + \sum_{i=1}^{p} \beta_{12i} \Delta bd_{t-i} + \sum_{i=1}^{p} \beta_{13i} \Delta r_{t-i} + \sum_{i=1}^{p} \beta_{14i} \Delta er_{t-i} + \sum_{i=1}^{p} \beta_{15i} \Delta sp_{t-i}$$

$$+ \sum_{i=1}^{p} \beta_{16i} \Delta b_{t-i} + \beta_{17} ec_{t-1} + u_{1t} \quad (7)$$

$$\Delta bd_t = \beta_{20} + \beta_{21} D_t + \sum_{i=1}^{p} \beta_{22i} \Delta bd_{t-i} + \sum_{i=1}^{p} \beta_{23i} \Delta r_{t-i} + \sum_{i=1}^{p} \beta_{24i} \Delta er_{t-i} + \sum_{i=1}^{p} \beta_{25i} \Delta sp_{t-i}$$

$$+ \sum_{i=1}^{p} \beta_{26i} \Delta b_{t-i} + \beta_{27} ec_{t-1} + u_{2t} \quad (8)$$

where Δ is the first difference operator, b_t is balance of trade, balance of services, balance of current account or balance of payments, D_t is the dummy variable to capture the influence of the Asian financial crisis, 1997–1998, bd_t is the budget deficit, r_t is the real interest rate, er_t is the real exchange rate, sp_t is the real stock price return and $u_{i,t}$ (i = 1, 2) is a disturbance term (Kalou & Paleologou, 2012, p. 232). Baharumshah and Lau (2007) and Kalou and Paleologou (2012), amongst others, use the nominal variables in the analysis of the relationship between external balance and budget. In contrast, Rafiq (2010) and others use the real variables. The Mundell and Fleming theory, or the Keynesian absorption theory, implies that a budget deficit will lead to an external deficit. This hypothesis holds if the coefficient (β_{12i}) in equation (7) is significantly different from zero and the coefficient (β_{26i}) in equation (8) is not significantly different from zero. The Ricardian equivalence hypothesis suggests that there is no nexus between external deficit and budget deficit. This hypothesis holds if the coefficient (β_{12i}) in equation (7) and the coefficient (β_{26i}) in equation (8) are not be significantly different from zero. The current account targeting hypothesis indicates that uni-directional causality runs from external deficit to internal deficit. This hypothesis holds if the coefficient (β_{12i}) in equation (7) is not significantly different from

zero and the coefficient (β_{26i}) in equation (8) is significantly different from zero (Kalou & Paleologou, 2012, p. 233).

RESULTS AND DISCUSSION

The results of the ZA and LS unit root test statistics are reported in Table 2. The lag lengths used to estimate the ZA and LS unit root test statistics are based on the t-statistic, that is, the number of lags for which the last included lag has a marginal significance level less than the cut-off given by the 10% level. The fraction of entries on each end of data to exclude as the breaks and minimum gap between breaks is the 10% level. The results of the ZA and LS unit root test statistics show that all the variables except balance of payments and the real stock price return are mostly non-stationary in their levels but become stationary after taking the first differences. Thus the variables examined are a mixture of I(1) and I(0) variables. The results of the Elliot, Rothenberg and Stock (ERS) and Phillips and Perron (PP) unit root test statistics are reported in Table 3. The lag lengths used to compute the ERS unit root test statistics are based on the Schwarz Bayesian Criterion. The lag lengths used to compute the PP unit root test statistics are based on the Newey-West automatic bandwidth selection with the maximum lag length set to seven. Generally, the ERS and the PP unit root test statistics show about the same conclusion as the ZA and LS unit root test statistics.

Table 2
The results of the Zivot and Andrews (1992) (ZA) and Lee and Strazicich (2004) (LS) unit root test statistics

	ZA – Crash	LS – Crash	ZA – Break	LS – Crash
bt_t	–4.3818 (1998)	–3.4180* (1997)	–4.1970 (1998)	–3.9753 (1996)
$\Delta\, bt_t$	–5.3863*** (1996)	–4.4885** (1999)	–5.2494** (1996)	–4.4637* (1999)
bs_t	–6.0060*** (2000)	–2.5571 (1999)	–5.2012** (2000)	–5.0226** (2000)
$\Delta\, bs_t$	–7.2515*** (1985)	–6.4062*** 1995)	–8.0246*** (2000)	–6.9630*** (1997)
bca_t	–4.0607 (1998)	–4.0506** (1997)	–3.6486 (1998)	–4.4454* (1996)
$\Delta\, bca_t$	–5.5284*** (1996)	–4.4958***(1999)	–5.4043** (1996)	–4.6668** (1987)
bop_t	–5.1355** (1994)	–4.5874*** (1996)	–5.4647** (1994)	–5.1541*** (2006)
$\Delta\, bop_t$	–6.2308*** (1994)	–5.1566*** (1996)	–6.1105*** (1994)	–6.6800*** (2003)
bd_{1t}	–2.0886 (2008)	–3.2062 (2008)	–2.0363 (1995)	–4.9616** (1994)
$\Delta\, bd_{1t}$	–7.6093*** (2004)	–7.6278*** (1993)	–8.0594*** (2004)	–5.6598** (2006)
bd_{2t}	–3.2537 (1983)	–1.2878 (1986)	–3.3916 (1988)	–4.3848* (1997)

(*continued on next page*)

Table 2 *(continued)*

	ZA – Crash	LS – Crash	ZA – Break	LS – Crash
$\Delta\, bd_{2t}$	–5.5649*** (2003)	–4.8608*** (1994)	–5.7874*** (1998)	–5.3435*** (1988)
r_t	–6.4112*** (1998)	–1.5893 (1997)	–3.9461 (1998)	–6.1030*** (1986)
$\Delta\, r_t$	–7.5497*** (1986)	–4.9283*** (2009)	–5.0676 (1989)	–6.5721*** (2009)
er_t	–4.0039 (1986)	–3.0815* (2009)	–6.1121*** (1998)	–3.4157 (1998)
$\Delta\, er_t$	–5.0083** (1985)	–4.3822*** (2000)	–7.4674*** (1989)	–4.9425** (1988)
sp_t	–7.9993*** (1987)	–5.7301*** (2003)	–7.9445*** (1995)	–5.8760*** (1996)
$\Delta\, sp_t$	–8.1142*** (1999)	–7.5956*** (2009)	–8.2925*** (1990)	–7.6486*** (1997)

Notes: Crash denotes the ZA or LS unit root test statistic for testing an abrupt change in level but no change in the trend rate. Break denotes the ZA or LS unit root test statistic for testing an abrupt change in level and a change in the trend rate. Values in parentheses are the breaks. The critical values can be obtained from Zivot and Andrews (1992) and Lee and Strazicich (2004). *** (**, *) denotes significance at the 1% (5%, 10%) level.

Table 3
The results of the Elliott, Rothenberg and Stock (ERS) and Phillips and Perron (PP) unit root test statistics

	ERS – No trend	ERS – Trend	PP – No trend	PP – Trend
bt_t	–1.6524	–2.3448	–1.7649	–2.5914
$\Delta\, bt_t$	–3.6079***	–4.3758***	–4.8842***	–4.7901***
bs_t	–0.7565	–3.0822	–0.6487	–3.1190
$\Delta\, bs_t$	–6.5522***	–6.5984***	–6.9684***	–7.0055***
bca_t	–1.3732	–2.5446	–1.5006	–2.6554
$\Delta\, bca_t$	–3.9051***	–4.6501***	–5.0661***	–4.9567***
bop_t	–4.8272***	–5.0384***	–4.6638***	–4.8146***
$\Delta\, bop_t$	–5.2240***	–7.1306***	–8.4572***	–8.2617***
bd_{1t}	–1.5839	–1.7637	–1.9044	–0.8425
$\Delta\, bd_{1t}$	–1.3661	–7.8327***	–7.3365***	–10.4669***
bd_{2t}	–1.2180	–1.3174	–2.3920	–1.4859
$\Delta\, bd_{2t}$	–3.8957***	–4.5469***	–4.2864***	–5.0247***
r_t	–2.5484**	–2.9990*	–3.1502**	–3.0428
$\Delta\, r_t$	–5.2860***	–4.4437***	–7.4315***	–8.1831***
er_t	–0.7683	–1.8517	–1.2556	–2.0703
$\Delta\, er_t$	–4.1848***	–4.2545***	–4.0584***	–4.0139**
sp_t	–6.1475***	–6.8904***	–7.1464***	–7.0349***
$\Delta\, sp_t$	–0.7970	–5.9538***	–15.1331***	–14.7734***

Notes: ERS – No trend denotes the Elliott, Rothenberg and Stock test statistic estimated with the model included a constant only. ERS – Trend denotes the Elliott, Rothenberg and Stock test statistic estimated with the model included a constant and a time trend. PP – No trend denotes the Phillips and Perron test statistic estimated with the model included a constant only. PP – Trend denotes the Phillips and Perron test statistic estimated with the model included a constant and a time trend. *** (**, *) denotes significance at the 1% (5%, 10%) level.

The results of the bounds testing approach are reported in Table 4. The Wald-statistics are found to be statistically significant at the 1% level. Hence there is a long-term relationship between balance of trade, balance of service, balance of current account and balance of payments and determinants of balance trade, balance of service, balance of current account and balance of payments, respectively including consolidated public sector finance or federal government finance. Additionally, there is a long-term relationship between consolidated public sector finance or federal government finance and its determinants including balance of trade, balance of service, balance of current account or balance of payments. In other words, those variables are moving together and would not move far from each other in the long term. The results of the Johansen likelihood ratio test statistics, namely, the maximum eigenvalue statistic (λ_{Max}) and the trace statistic (λ_{Trace}), are computed with unrestricted intercepts and no trends in the VAR are reported in Table 5. The lag lengths used to compute the VAR are based on the Schwarz Bayesian Criterion. The results show that the null hypothesis of no co-integration among balance of trade, balance of service, balance of current account or balance of payments and its determinants is rejected. There is at least one co-integrating vector among those variables. Thus, testing of the Granger causality should be tested in the VECM.

Table 4
The results of the bounds testing approach for co-integration

	$\Delta\, bd_{1t}$	$\Delta\, bd_{2t}$
$\Delta\, bt_t$	63.1211***	50.5016***
$\Delta\, bd_t$	22.2678***	67.9550***
$\Delta\, bs_t$	27.1925***	28.4719***
$\Delta\, bd_t$	16.0384***	44.1807***
$\Delta\, bca_t$	17.2177***	35.2828***
$\Delta\, bd_t$	34.1032***	80.8432***
$\Delta\, bop_t$	37.4048***	77.5951***
$\Delta\, bd_t$	26.0753***	54.2580***

Note: Values are Wald-statistics, *** denotes significance at the 1% level.

The results of the co-integration test show that there is long-term relationship between external balance and its determinants, including budget, and also between budget and its determinants, including external balance. Chihi and Normandin (2013), among others, report a positive relationship between the external deficit and budget deficit. Consolidated public sector finance is found to Granger cause balance of trade and balance of current account. However, federal government finance is found to Granger cause balance of payments. Hence these

findings support the current account targeting hypothesis. Kalou and Paleologou (2012), among others, document that the current account targeting hypothesis happens in Greece. In other words, fiscal policy can be used to address external imbalance. Federal government finance is found to Granger cause balance of services and not the reverse. This supports the Mundell and Fleming theory or the Keynesian absorption theory. Baharumshah and Lau (2007) and others arrive at the same conclusion for Thailand. However, there is no Granger causality found between consolidated public sector finance and balance of services. Thus the impacts of consolidated public sector finance and federal government finance on external balances are not the same. Additionally, consolidated public sector finance is found to have marginally more impact on external balances than federal government finance has. Budget may reduce imbalance of some goods and services but not others due to different elasticities of goods and services. To implement an effective policy, the government should determine the link between external balances and budgets and also the causality between them.

Table 5
The results of the Johansen Likelihood Ratio Test statistics

			λ_{Max} Test statistic		
H_0:	r = 0	r ≤ 1	r ≤ 2	r ≤ 3	r ≤ 4
H_a:	r = 1	r = 2	r = 3	r = 4	r = 5
bd_{1t}					
bt_t	35.94*	26.88	20.07	12.78	0.26
bs_t	35.81*	25.85	10.49	8.18	0.58
bca_t	30.02	28.73*	20.73	13.68	0.13
bop_t	45.68*	26.80	19.45	7.42	1.86
bd_{2t}					
bt_t	55.43*	34.28*	30.30*	20.50*	0.04
bs_t	43.79*	31.93*	12.89	93.45	0.22
bca_t	48.23*	41.52*	24.60*	15.06*	0.02
bop_t	51.87*	29.90*	21.29*	10.67	0.53
			λ_{Trace} Test statistic		
H_0:	r = 0	r ≤ 1	r ≤ 2	r ≤ 3	r ≤ 4
H_a:	r ≥ 1	r ≥ 2	r ≥ 3	r ≥ 4	r = 5
bd_{2t}					
bt_t	95.92*	59.99*	33.11*	13.04	0.26
bs_t	80.91*	45.10	19.26	8.76	0.58

(*continued on next page*)

Table 5 *(continued)*

bca_t	92.90*	62.88*	34.54*	13.81	0.13
bop_t	101.21*	55.53*	28.73	9.28	1.86
bd_{2t}					
bt_t	140.56*	85.12*	50.84*	20.54	0.04
bs_t	98.30*	54.50*	22.57	9.68	0.22
bca_t	129.44*	81.21*	39.68*	15.08	0.02
bop_t	114.26*	62.39*	32.49*	11.20	0.53

Notes: The VAR = 2 is used in the estimations. The critical value is based on MacKinnon et al. (1999).
* denotes significance at the 5% level.

The results of the Granger causality test are reported in Table 6. The lag length used to compute the Granger causality test statistic is based on the Akaike Information Criterion. Generally, the estimated models fulfil the conditions of normality of disturbance terms, no autocorrelation, homoscedasticity of disturbance terms and no functional form of the model. However, the Granger causality test statistics are based on the ordinary least squares with Newey-West corrected standard errors when autocorrelation or autocorrelation and heteroscedasticity of disturbance terms are found to be statistically significant. The short-term Granger causality, or weak Granger causality, which shows the short-term influence of the independent variables on the dependent variable, can be tested through the F-statistic on the coefficients of the lagged differences. For consolidated public sector finance, there are long-term relationships between balance of trade, balance of current account or balance of payments and budget which are implied by the significance of the error correction terms, except balance of services when it is a dependent variable. On the whole, there is no causality from consolidated public sector finance to balance of trade, balance of service, balance of current account or balance of payments. Nonetheless, there are causalities from balance of trade and balance of current account balance to consolidated public sector finance. Thus this supports the current account targeting hypothesis. For federal government finance, long-term relationships are found between external balances and budget, except balance of services when it is dependent variable and balance of trade and balance of account when they are independent variables. There is no causality from federal government finance to external balances, except federal government finance is found to influence balance of services. Additionally, causality is found from balance of payments to federal government finance. There is no evidence of causality between balance of trade and balance of payments and federal government finance. This supports the Ricardian equivalence hypothesis. On the whole, this study finds evidence that the current account targeting hypothesis and the Ricardian equivalence hypothesis dominate the relationship between external balances and budgets.

The finding that budgets cause external balances implies that the government can reduce the budget deficit to improve the external deficit. In addition, the government should consider other measures such as controlling inflation and maintaining the competitiveness of exports. In the long run, a small open economy such as Malaysia should reform its tax to curve tax evasion and continue to transform its economy successfully. Cutting public spending to reduce the budget deficit is also important (Kalou & Paleologou, 2012, p. 239). In the long run, the focus should be on improving productivity and quality through technological advancement to enhance the export competitiveness of Malaysia. Malaysia aims to achieve a high-income economy by the year 2020. In the 10th Malaysia Plan (2011–2015), strategies have been proposed for transforming the Malaysian economy, maintaining full employment, pursuing productivity-led growth, increasing the dynamism of the private sector, promoting growth in private consumption, diversifying export markets, sustaining balance of payments surplus and improving the efficiency of fiscal policy. Also in the 10th Malaysia Plan, several measures have been implemented to ensure the sustainability of public finance in the long run. A two-year rolling plan has been implemented to provide flexibility in expenditure management in tandem with fiscal resources and policy priorities. Value management is required for development projects above RM 50 million, and outcome-based budgeting will be introduced. The efficiency and effectiveness of government spending shall be assessed (MOF, 2012, p. 123). However, the improvement of external balances depends largely on how successfully and effectively those strategies are implemented.

Table 6
The results of the Granger Causality Test

Dependent variable	$\Delta\, bd_{1t-i}$	ec_{t-1}	Normal	LM	Hetero	Reset
$\Delta\, bt_t$	0.9818	–4.4797***	0.0132	5.4322***	1.3879	6.3886**
$\Delta\, bs_t$	0.2997	–1.1645	0.7272	0.9665	2.9989	15.0996***
$\Delta\, bca_t$	0.0728	–2.3972**	0.4201	1.8243	0.3283	7.3984***
$\Delta\, bop_t$	0.0567	–2.7673***	1.5080	0.5814	0.6568	3.3598
Dependent variable	$\Delta\, b_{t-i}$	ec_{t-1}	Normal	LM	Hetero	Reset
$\Delta\, bd_{1t}$ ($\Delta\, bt_t$)	3.5437*	–3.0668***	0.8484	0.3687	0.8169	1.2265
$\Delta\, bd_{1t}$ ($\Delta\, bs_t$)	0.4856	–3.1873***	1.3469	0.1513	0.9685	0.9659
$\Delta\, bd_{1t}$ ($\Delta\, bca_t$)	2.8573*	–3.5160***	1.3188	0.6083	1.7142	0.2943
$\Delta\, bd_{1t}$ ($\Delta\, bop_t$)	0.0056	–2.4839**	0.7728	0.4980	0.0639	0.0422

(*continued on next page*)

Table 6 *(continued)*

Dependent variable	$\Delta\, bd_{2t-i}$	ec_{t-1}	Normal	LM	Hetero	Reset
$\Delta\, bt_t$	1.5309	–1.7856*	0.3043	8.1291***	3.8446*	7.7048**
$\Delta\, bs_t$	4.5910**	–1.4081	0.1607	0.5501	2.7378	16.8748***
$\Delta\, bca_t$	0.7216	–2.4780**	0.4846	1.9528	0.4470	3.0023
$\Delta\, bop_t$	0.9330	–3.2188***	2.0812	0.4527	0.5518	3.4522*
Dependent variable	$\Delta\, b_{t-i}$	ec_{t-1}	Normal	LM	Hetero	Reset
$\Delta\, bd_{2t}$ ($\Delta\, bt_t$)	0.8541	–0.8185	0.5682	4.8726**	1.5730	0.3324
$\Delta\, bd_{2t}$ ($\Delta\, bs_t$)	0.7808	–1.7386*	1.6123	2.4605	0.0154	1.3893
$\Delta\, bd_{2t}$ ($\Delta\, bca_t$)	1.5476	–1.2032	0.3842	2.7547*	1.2547	0.1255
$\Delta\, bd_{2t}$ ($\Delta\, bop_t$)	3.9386*	–2.2478**	1.7929	1.0355	0.0112	0.1341

Notes: $\Delta\, b_{t-i}$ denotes $\Delta\, bt_{t-i}$, $\Delta\, bs_{t-i}$, $\Delta\, bca_{t-i}$ or $\Delta\, bop_{t-i}$. The values under the columns $\Delta\, bd_{1t-i}$, $\Delta\, bd_{2t-i}$ and $\Delta\, b_{t-i}$ are the F-statistics whilst the values under the column ec_{t-1} are the t–statistics. Normal denotes Jargue–Bera test of the residual normality. LM denotes Breusch–Godfrey serial correlation test. Hetero denotes the residual heteroskedasticity test. Reset denotes Ramsey regression equation specification error test (RESET). *** (**, *) denotes significance at the 1% (5%, 10%) level.

CONCLUSION

This study has examined the link between external balance and budget in Malaysia. It is important to determine the link between external balances and budgets, and also the causality between them, for implementing an effective budget policy. There is a long-term relationship between external balances and budgets. This study finds evidence that the current account targeting hypothesis and the Ricardian equivalence hypothesis dominate the relationship between external balances and budgets. Consolidated public sector finance is found to have marginally more impact on external balances than federal government finance has. A budget may reduce the imbalance of certain goods and services, or one component of balance of payments but not others due to different elasticities of goods and services. One way to address the external imbalance, especially in the short term, is through the use of the budget. In the short term, it is crucial for the government to control inflation in the country. Cutting public spending and the effective use of the public spending are important to address external balance. In the long-run, the focus should be on improving productivity and the quality of products and services through technological advancement to enhance the export competitiveness of Malaysia. Successful and effective transformation of the Malaysian economy to a higher level is crucial.

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