THE TWIN DEFICITS HYPOTHESIS IN AN OIL BASED ECONOMY: THE CASE OF BAHRAIN

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Abstract

Aim of this paper is to discuss the twin deficit hypothesis, review the literature and examine the twin deficit hypothesis to the economy of Bahrain. While the twin hypothesis claims that the increase in budget deficit lead to a similar increase in current account deficit, the Ricardian Equivalence Hypothesis claims an absence of any relationship between the budget deficit and the current account deficit. National accounts annual data are used to explore this relationship. Following the example of several studies, the paper uses Granger Causality Test between current account and Government budget deficits. The available data only covers the period from 2004 to 2014. According to the Granger causality test results, the twin deficit hypothesis was not confirmed for Bahrain data over the time period of the analysis. There was also no reverse causality found between budget balance and current account.

Keywords: Twin Deficits, Current Account, Government Balance, Bahrain, Granger Causality

INTRODUCTION

In the aftermath of the Arab Spring and the country's ongoing unrest, Bahrain's economy has been characterized by persisting budget deficits reaching 5.70 percent of the country's Gross Domestic Product in 2013.Because the GDP of most countries tends to increase increases by about 2-3 percent per year, most governments try to keep their deficits below 3 percent of GDP to offset the increase in debt by the increase in GDP. Due to the political situation, Bahrain's economic growth slowed to an average of 2.6% during 2011–12, although, the economy grew strongly through the 2000s, expanding by an average of 5.8% per year before the unrest. With the deterioration in Bahrain's budget deficit, the trade surplus has also big fluctuations in recent

years. Many analysts suspect that persistent budget deficits eventually lead to trade deficits (the twin-deficit hypothesis).

In economic literature, two prime approaches are known to have explored the relationship between the current account deficit of the balance of payments (BOP)and budget deficit of a country: the conventional Keynesian preposition and the Ricardian Equivalence. Numerous empirical studies support the view that fiscal deficits significantly contribute to a deterioration of the current account. This raises a number of questions concerning the long term effects of Bahrain's current budget deficits on trade balances. To which extent do variations in budget deficits explain variations in current account balances? Does a strong empirical correlation between these two variables necessarily indicate a causal relationship?

The objective of this paper is to address these questions and to examine the twin deficit hypothesis for Bahrain, employing Granger-causality tests for the period (2004 - 2014. In this context, establishing and understanding the relationship between Budget Balance and Trade Balance would help to formulate appropriate macroeconomic policies for the country. This paper is organized as follows. Part two discusses the link between budget deficits and trade deficits. Part three and four reviews the empirical literature and the case of oil exporting countries. Part five is devoted to Bahrain's experience, statistical data and Granger causality test results.

THE LINK BETWEEN BUDGET DEFICIT AND TRADE

According to the Keynesian proposition, there is a causality relation from budget deficit towards current account deficit. This is triggered by the decrease in national saving which is the sum of private saving plus the government fiscal balance. To restore equality between desired national saving and investment demand, real interest rate would have to rise. The higher real interest rate crowds out investment and decreases the stock of productive capital in the long run in a closed economy. In an open economy the higher real interest rate attract foreign investments in the country's financial market. This raises the demand for the country's currency causing it to appreciate and making exports less attractive and imports more attractive, subsequently increasing imports and worsening the trade balance, which is the major component in the current account deficit.

Hence, the primary transmission channels are interest rates and exchange rates. These transmissions channels vary according to the type of the exchange rate regime (Leachman and Francis: 2002) and the degree of openness of an economy (Corsettiand Müller: 2006). It is also important to note that if the deficit is caused by an expansionary fiscal policy that is totally financed by borrowing from foreigners, domestic interest rates as well as domestic investment and private saving would not change much. This case is most likely to occur in small economies

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that is fully open to international trade and capital flows. Furthermore, in the presence of unemployed resources, the effect of budget deficits on trade deficits is likely to be smaller and national saving decline much less than in a fully employed economy. However, there is an extensive literature [e.g. Flaming (1962); Mundell (1963); Bernheim (1988); Hung and Charette (1997); and Pattichis (2004)among others] that supports the keynesian proposition.

The linkage between the government budget balance and the trade balance can be also explained using the following equation, which depicts the relationship between the government budget balance (T – G), the trade balance (X – M) and the private investment and savings balance (I – S), where T is taxes, G is the government purchases, I is the investment, S is savings, X is the exports and M is the imports:

$$T - G = (I - S) + (X - M).$$

This means that the government budget deficit is equal to the trade surplus/deficit plus the excess of investment over private saving. The above equation is derived from national income accounting identities. First, individuals dispose of income (Y) either as consumption (C), saving (S), or taxes (T). Second, income must arise from either the domestic sale of consumption goods (C), investment goods (I), governmental goods (G), or the net sale of goods to foreign agents (exports, X, minus imports, M). Combining the two equations, we obtain C+S+T=C+I+G+X-M, which can be simplified to:

$$T - G = (I - S) + (X - M).$$

The impact of budget deficits falls on X - M or I - S is an open question. Bernheim (1988) explains that deficits causes, either the trade surplus (X - M) to decline or the excess of investment over saving (I-S) to decline. He also notes that this conclusion follows directly from accounting and does not depend on any behavioral theories.

The Ricardian Equivalence Hypothesis claims an absence of any relationship between the budget deficit and trade deficits (Barro 1989). In contrast with the Keynesian proposition, this hypothesis argues the decrease of public saving will be compensated for by an equal increase of private saving, and hence the national saving will not be affected. There are two important conditions under which fiscal policy would only affect I - S and leave net exports unchanged. The first condition would arise if world capital markets were completely nonexistent and accordingly, private saving would always equal the sum of investment and government borrowing. In this case an increase in the deficit would necessarily produce a commensurate increase in S - I, and X - M would remain unchanged.

Yet the first condition described above do not holds in practice since international capital markets are now integrated to a very large extent. The second condition would arise if households view the present tax cut as a tax burden in future and respond by increasing their savings to prepare for a future of higher taxation. Accordingly, saving would rise by enough to compensate the decrease in public saving and avoid having to borrow from abroad. In this case the real interest rate does not have to rise in a closed economy to maintain balance between desired national saving and investment demand.

Reverse causation from trade to budget deficits has been discussed recently. Kearney and Monadjami (1990) explain that this link can come about if there is decrease in expected inflation that would lead to currency appreciation and an increase the trade deficit. This reverse causation can be found during recession, financial or solvency crisis caused by excessive trade deficits anddebts accumulation (Kim and Kim: 2006). To rehabilitate the financial sector, a large injection of public funds may be needed which may ultimately lead to budget deficit.

EMPIRICAL EVIDENCES

The empirical study of relationship between budget deficit and current account deficit started to draw researcher's attention in the 1980's. Bemheim (1988) studied the historical relationships between fiscal policy and the current account for the United States and five of its major trading partners. His analysis of U.S. time series indicated that a $1 rise in government budget deficits led to roughly a $0.30 increase in the current account deficit. He obtained similar figures for Canada, the United Kingdom, and West Germany, as well as from an overall cross-country comparison. For Mexico, this effect was significantly larger, about $0.80 to a dollar based on his study to the historical relationship between trade deficits and budget deficits. In contrast, for Japan the data collected was inconsistent with the view that budget deficits significantly affect the current account balance. He attributed this to the stringent controls that the Japanese had traditionally placed on international trade and flows of capital.

Many economists in the 1980s supported the Ricardian Equivalence Hypothesis that claims an absence of any relationship between the budget deficit and trade deficits due to the absence of any Granger causality relationship between the two deficits. One such study was carried out by Chris Carroll and Lawrence Summers (1987). They noted that the relative values of the net national saving rates in the USA and Canada appeared to be invariant with the relative values of the budget deficits, as implied by the Ricardian view. The data collected indicated that the private saving rates in the two countries were similar until the early 1970s, but

to the greater increase in the Canadian budget deficit as a ratio to GNP, the Canadian saving rate became higher by about six percentage points.

Several studies, that also had rejected the Keynesian proposition, found little relationship between budget deficits and interest rates. For example, Plosser (1982) observed quarterly U.S. data from 1954 to 1978 and found out that unexpected movements in privately-held federal debt did not raise the nominal yield on government securities of various maturities and there was a weak tendency for yields to decline with innovations in federal debt. Furthermore, Evans (1987) studied annual U.S. data from 1931 to 1979 and found out that the real federal deficits in this period had no significant association with nominal interest rates on commercial paper or corporate bonds, or with realized real interest rates on commercial paper. Yet over the longer period from 1908 to 1984, using monthly data, he found that there was some indication of a negative relation between deficits and nominal or real interest rates.

Nevertheless, a growing number of studies have emerged recently to support the Keynesian proposition. Salvatore (2006) tested the data of US, Japan, Germany, Britain, France, Italy and Canada for 1973 – 2005 periods. According to the results, there were strong proofs for direct relation between budget deficit and current account deficit. However, this relation showed itself as delayed. Chang (2011) argued that the budget balance and the trade balance were kin for the case of Taiwan and thatthere was no support for the Ricardian equivalence. He employed time series data for econometric testing and modelling to explore whether the Keynesian proposition or Ricardian equivalence was applicable to Taiwan over the 1967 to 2003 period. He used a range of unit root tests and a group of M-tests, to test Keynesian proposition and for testing Ricardian equivalence, private saving was investigated for its relationship with the budget balance.

In addition, Bagheri, Piraee and Keshtkaran (2012) examined the relationship between budget deficit and current account deficit in Iran from 1971 to 2007, using Johansen co-integration and Granger causality tests. The results indicated that there was a long run equilibrium link between budget deficit and current account deficit. Omoniyi, Olasunkanmi, and Babatunde (2012) also examined and confirmed the existence of the causal relationship between the budget deficit and trade deficits in Nigeria using time series data for the periods of 1970 to 2008.

THE CASE OF OIL EXPORTING COUNTRIES

Few studies on the relationship between current account and government budget balance were carried out for the Gulf region. Alkswani (2000) applied the twin deficit hypothesis to the Saudi economy and concluded that the twin deficit hypothesis may not be applied to countries that are

oil-based economies. His research used annual times series data covering the period 1970-1999. He argued that the Keynesian and the Ricardian hypotheses are not valid in oil based economy because oil is the main source of income and the government does not need to collect taxes to finance its budget. He also noted that public expenditure play a major part in the oil-based economies for both production and income distribution and since oil export is the main source of income and determines the ability of the government to spend, oil- based economies within the region do not need to collect taxes to finance government expenditures. Based on the previous argument he expected a reversed causality that is trade deficit causes budget deficit. He ran two tests: the Johansen Cointegration Method and the Granger Causality Test. The first confirmed the existence of a long-run equilibrium relationship between the two deficits but did not determine the direction of the causality. The Second showed that the direction of the causality was running from the current account to the government budget balance.

Reisen (1998) and Khalid and Teo (1999) argued that reverse causality should be more present in developing countries because those countries have a strong dependence on external funds and limited domestic resources. Small open commodity-based economies, in particular, are highly exposed and sensitive to external price shocks. Examples of other studies that support reverse causation are Kearney and Monadjami (1990), Anoruo and Ramchander (1998), and Sobrino 2012. Sobrino examined causation between the current account and the fiscal surplus as well as fiscal spending, using quarterly data for Peru. The outcomes of this study rejected the twin deficits hypothesis and pointed strongly to reverse causality between the fiscal account and the current account.

Merza, Alawin and Bashayreh (2012) examined the twin deficit hypothesis to the Kuwaiti economy. As well as Alkswani (2000), their study confirmed the existence of long-run equilibrium and a reverse causality between budget balance and current account. The granger causality test was consistent with their prediction that the causality direction went from current account to budget balance and not the other way. They also argued that the increase in the budget deficit was driven mainly by the surplus of the trade balance which encouraged the Kuwaiti government to spend more.

BAHRAIN'S DATA AND STATISTICS

Bahrain has the greatest reliance of hydrocarbon revenues, as measured by oil revenues as a percentage of total government revenues. This percentage rose from 60.8% in 2004 to 87.6% in 2012 as shown in Figure (1). Table (1) shows total state revenues for the fiscal years 2004-2014 in Bahraini Dinars (BD). Table (2) includes both total revenues and expenditures as well as the overall fiscal balance for the fiscal years 2004-2014.

Figure (1): Percentage of Oil Revenues and other Contributions in Bahrain (2004-2014)
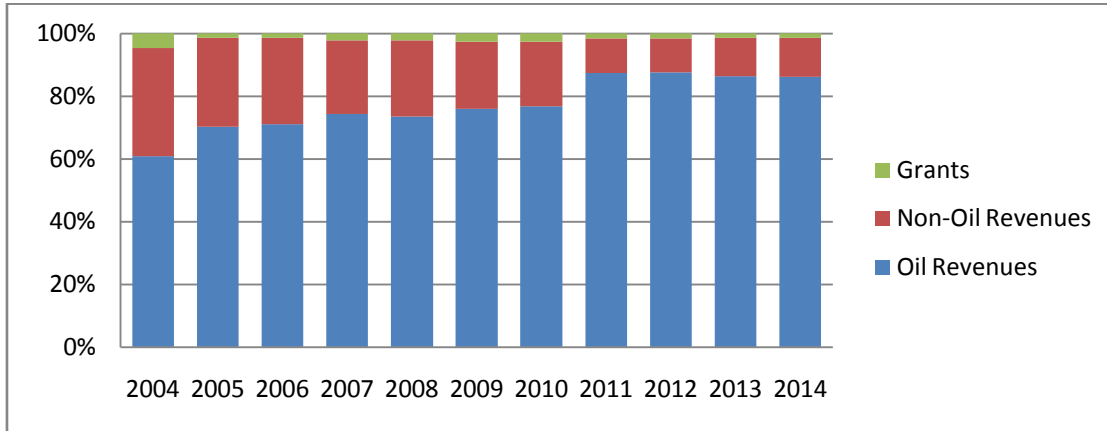

Table (1): Total Oil Revenues and other Contributions in Bahrain (2004-2014)

Year	Oil revenues	Non oil revenues	Grants	Total revenues
2004	490,000,000	278,400,000	37,600,000	806,000,000
2005	890,230,000	360,000,000	19,000,000	1,254,230,000
2006	895,730,000	345,000,000	19,000,000	1,274,730,000
2007	1,235,000,000	388,000,000	37,600,000	1,660,600,000
2008	1,241,000,000	409,300,000	37,600,000	1,687,900,000
2009	1,061,583,000	299,742,000	37,600,000	1,398,925,000
2010	1,123,628,000	302,689,000	37,600,000	1,463,917,000
2011	1,997,859,000	252,422,000	37,600,000	2,287,881,000
2012	2,058,008,000	252,422,000	37,600,000	2,348,030,000
2013	2,406,600,000	346,692,000	37,600,000	2,790,892,000
2014	2,404,200,000	351,505,000	37,600,000	2,793,305,000

Source: www.mof.gov.bh/ Ministry of Finance Bahrain

Table (2): Government Revenues, Expenditures and the Fiscal Balance in Bahrain (2004-2014)

Year	Total revenues in BD	Total expenditures in BD	Fiscal Balance in (BD millions)
2004	806,000,000	1,188,659,000	-382.7
2005	1,254,230,000	1,462,833,400	-208.6
2006	1,274,730,000	1,577,576,600	-302.9
2007	1,660,600,000	1,854,600,000	-194.0
2008	1,687,900,000	1,871,900,000	-184.0
2009	1,398,925,000	2,082,948,000	-684.0
2010	1,463,917,000	2,192,728,000	-728.8
2011	2,287,881,000	3,123,577,000	-835.7
2012	2,348,030,000	3,075,015,000	-727.0
2013	2,790,892,000	3,624,092,000	-833.2
2014	2,793,305,000	3,707,743,000	-914.4

Source: www.mof.gov.bh/ Ministry of Finance Bahrain

According to Table (2), Bahrain's budget balance shows continuous deficit. The highest value of deficit was recorded recently in 2014, a value of 914.4 million BD. According to the International Monetary Fund, Bahrain has currently a breakeven price of USD120/barrel which is the highest price of any Gulf Cooperation Council (GCC) member. Recently the price of has fallen by more than 40% since June 2014, when it was USD115/barrel, reaching less than USD70/barrel in December 2014. With the current slowdown in economic activity and the decrease in the demand for oil, the price is likely to continue to fall unless the Organization of Petroleum Exporting Counties reached an agreement to curb production. Therefore, The International Monetary Fund urged Bahrain to cut spending or risk unsustainable public debt as its fiscal deficit continue to widen and oil prices decline.

Table (3) shows the value of oil exports and the current account balance from (CA) 2004 to 2013. Bahrain's CA witnessed a complete series of surplus during the period 2004-2013. In 2014, it reached 962.6 million BD, according to Bahrain Central Bank recent statistics. However, CA shows big fluctuations during the period of the study. It reached its maximum value in 2011, reaching a value of 1,220.9 million BD. The minimum surplus was in 2004 (a value of 156.2million BD). It worth noticing that the lowest value of oil exports was recorded in 2004 and the maximum value in 2011, rising from 2,087.3 million BD in 2004 to 5,824.5 million BD in 2011. This indicate a strong correlation between oil exports and the current account surplus as shown in figure (2).

Table (3): Oil Exports and the Current Account Balance in Bahrain (2004-2013)

Year	Oil Exports in (BD millions)	Current Account Balance in (BD millions)
2004	2,087.3	156.2
2005	2,926.6	592.2
2006	3,465.8	721.3
2007	4,059.3	1,092.9
2008	5,184.6	848.6
2009	3,351.5	210.6
2010	3,828.0	289.8
2011	5,824.5	1,220.9
2012	5,712.8	1,104.7
2013	5,750.0	835.4

Source: www.cbb.gov.bh/ Central Bank of Bahrain

Figure (2): Fluctuations in Oil Exports and the Current Account Balance in Bahrain (2004-2013)
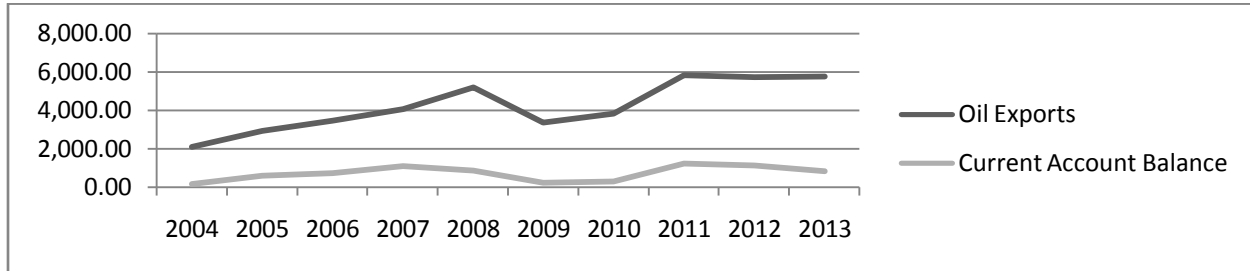
Figures (3) and (4) attempt to explore the relationship between Bahrain's oil exports and government oil revenues. As mentioned earlier in this section, the share of oil revenues in total government revenues have increased significantly in the last ten years, reaching 87.6% in 2012. It is also worth to mention that there was a significant increase in oil exports and that oil government revenues constituted 20 to 30 percent of export earnings during the period of study, as shown in Figure (3). The increase in oil exports and government revenues from oil encourages the government to spend more causing the budget deficit to increase as shown in table (2). The same pattern was observed in Kuwait (Merza, Alawin and Bashayreh (2012).

Figure (3): Percentage of Government Oil Revenues from Oil Export Earnings
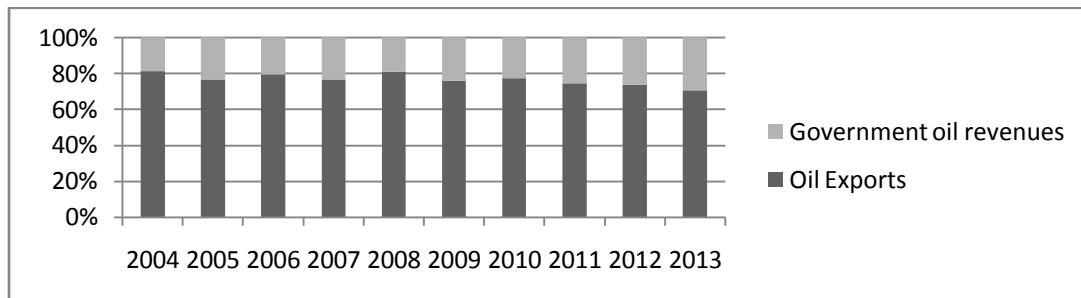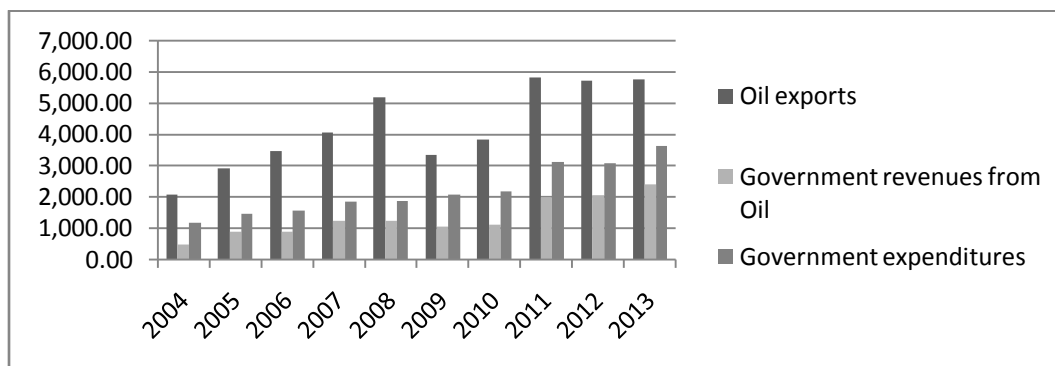in Bahrain (2004-2013)

Figure (4): Fluctuations in Oil Exports, Government Oil Revenues
and Government Expenditures

Granger causality test results

As previously discussed, the empirical literature investigating the twin deficits hypothesis often tests for Granger-causality between current account CA and Government budget deficits GBD. CA is said to be Granger-caused by GBD if GBD helps in the prediction of CA, or equivalently if the coefficients on the lagged GBD statistically significant. The test help in determining the short-run or forecasting direction of the relation between GBD and CA, ignoring the long-run effects.

From Granger-causality test results it can be concluded that the twin deficit hypothesis was not confirmed for Bahrain data over the time period of the analysis. and Merza, Alawin and Bashayreh (2012) confirm the same results for Kuwait and Alkswani (2000) for Saudi Arabia.

However, the test results are also not consistent with the other predictions and the results of studies conducted by Alkswani (2000) and Merza, Alawin and Bashayreh (2012), as their study confirmed the existence of a reverse causality between budget balance and current account in Saudi Arabia and Kuwait.As shown below, GBD does not Granger Cause CA and CA does not Granger Cause GBD according to this study.

Table (4): Pairwise Granger Causality Tests

Date: 07/15/14   Time: 09:11
Sample: 2004 2014
Lags: 1

Prob.	F-Statistic	Obs	Null Hypothesis:
0.3012	1.24583	10	GBD does not Granger Cause CA
0.7245	0.13470		CA does not Granger Cause GBD

Table (5): Dependent Variable: CA

Method: Least Squares
Date: 07/15/14   Time: 09:19   Sample: 2004 2014   Included observations: 11

Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0374	2.440104	260.7611	636.2842	CA
0.6949	-0.405074	0.426624	-0.172814	GBD
730.4727	Mean dependent var		0.017905	R-squared
374.7290	S.D. dependent var		-0.091216	Adjusted R-squared
14.94054	Akaike info criterion		391.4468	S.E. of regression
15.01289	Schwarz criterion		1379075.	Sum squared resid
14.89494	Hannan-Quinn criter.		-80.17298	Log likelihood
1.384282	Durbin-Watson stat		0.164085	F-statistic
			0.694882	Prob(F-statistic)

Table (6): Dependent Variable: GBD

Method: Least Squares				
Date: 07/15/14 Time: 09:23		Sample: 2004 2014	Included observations: 11	
Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0505	-2.256539	207.9925	-469.3432	CBD
0.6949	-0.405074	0.255780	-0.103610	CA
-545.0273	Mean dependent var		0.017905	R-squared
290.1534	S.D. dependent var		-0.091216	Adjusted R-squared
14.42896	Akaike info criterion		303.0981	S.E. of regression
14.50130	Schwarz criterion		826815.9	Sum squared resid
14.38335	Hannan-Quinn criter.		-77.35926	Log likelihood
0.520630	Durbin-Watson stat		0.164085	F-statistic

CONCLUSION

The main objective of this paper is to examine the relationship between the government budget deficit and the current account in a small open oil based economy. The economy of Bahrain is taken as an example. National accounts annual data are used to explore this relationship. The available data only covers the period from 2004 to 2014. According to the Granger-causality test results, the twin deficit hypothesis was not confirmed for Bahrain data over the time period of the analysis. There was also no reverse causality found between budget balance and current account.

These findings open the question whether the government should not worry about falling in a position of two deficits; current account and budget balance. The review of the literature indicates that the primary transmission channels are interests rates and exchange rates. Yet saving and interest rates likely not to change much in the case of a deficit caused by an expansionary fiscal policy in small economies with fixed exchange rates that is fully open to international trade and capital flows such as the case of Bahrain. However there is still a strong correlation between oil exports and the current account surplus which is likely to be negatively affected by the current decreases in oil prices.

As mentioned earlier, the paper uses Granger Causality Test, following the example of several studies, to examine the relationship between current account and Government budget deficits. The twin deficits hypothesis can be also investigated by employing other econometric techniques as the Vector Autoregression (VAR) model which is often used to estimate the relationship between a group of variables. The relationship between the budget deficits and interests rates can be also investigated, as well as the relationship between private saving and the budget balance.

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