

## The Relationship between Current Account and Government Budget Balance: The Case of Kuwait

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### Abstract

*The aim of this study is to examine the twin deficits hypothesis for Kuwait for the quarterly period (1993:4 - 2010:4). The twin deficit hypothesis states that an increase in the budget deficit will cause a similar increase in current account deficit. To analyze the relationship between the two variables, the paper tests the stationarity of the two variables, estimates the cointegration regression (the Johansen cointegration test), applies the VAR model, estimates the IRF, and tests for existence and the direction of causality. The causality test shows that the direction of causality goes from current account to budget balance. The other direction was not confirmed for this study. In addition, the results of this paper find a negative long-run relationship between current account and budget balance that is an increase in current account causes a decrease in the government budget surplus or an increase in budget deficit. This finding fits the Kuwaiti economy; since an improvement in the current account driven primarily by the improvement in the trade balance will cause the central government to spend more than it receive in revenue causing a decrease in government budget surplus or an increase in government budget deficit. Therefore, this paper reached to a conclusion that the twin deficit hypothesis was not confirmed for the Kuwaiti case.*

**Keywords:** twin deficit hypothesis, current account, government balance, Kuwait.

### 1. Introduction

In recent years, the twin-deficit hypothesis—the argument that fiscal deficits fuel current account deficits—has returned to the forefront of the policy debate. The argument first emerged in the 1980s, when a significant deterioration in the U.S. current account balance accompanied a sharp rise in the federal budget deficit (Bartolini; Lahiri, 2006).

Current account imbalances, historically was a concern of policy makers and public opinion in a number of countries. It is often argued that budget imbalances of the public sector are one of the important causes for the current account imbalances. So far, empirical work on the causal relationship between the current account and fiscal policy has been rather inconclusive. Some empirical studies find that higher budget deficits lead to higher current account deficits; others prove the opposite or show no significant impact at all (Nickel and Vansteenkiste, 2008). At times, economic data supports the twin deficit hypothesis. Other times, the data does not. However, interest in the theory rises and declines with the status of a nation's deficits.

The twin deficit hypothesis suggests that when a government increases its fiscal deficit — by cutting taxes or increasing expenditure—domestic residents use some of the additional income to boost consumption, part of it will be spent on foreign goods and services. Thus, a wider fiscal deficit as suggested by the Keynesian model typically should be accompanied by a wider current account deficit (Bartolini and Lahiri, 2006).

On the other hand, this result may not be necessarily true. In theoretical models the relationship between fiscal policy and private consumption depends largely on whether Ricardian equivalence is true. This equivalence theorem states that for a given path of government expenditures, the timing of taxes should not affect the consumption decision made by individuals paying the taxes. The simple idea behind the theorem is that rational agents realize that substituting taxes today for taxes plus interest tomorrow via government debt financing is the same (Barro, 1996). Therefore, the financing of government spending via debt or taxes should not affect the current account.

The main contribution of this paper is to examine the relationship between government budget balance and current account in Kuwait. This paper is the first one –to the best of our knowledge– that examines the existence of the twin deficits hypothesis in this oil based economy. The paper tests quarterly data for the period (1993:4 – 2010:4), by using different time series techniques: the unit root test, Johansen Cointegration, the Vector Autoregression (VAR), and the Granger Causality.

The structure for the rest of the paper continues as follows: Section II provides the literature review for the studies that examined the twin deficit hypothesis. In section III, the theoretical grounds of the twin deficit hypothesis will be briefly discussed. Section IV and V describe data the methodology used in this paper, respectively. Section VI presents the empirical results. The concluding remarks and policy implications are contained in the final section.

## 2. Literature Review

The question of relationship between budget deficit and current account deficit started to draw researcher's attention in the 1980's. The twin deficits hypothesis asserts that an increase in budget deficit will cause a similar increase in current account deficit. But results of testing this hypothesis turned out dissimilar for different countries and different econometric techniques.

Many authors prove the existence of such hypothesis like Ratha (2010) who used monthly data over (1998-2009) for the Indian economy. This paper used the cointegration approach and found that the twin deficits theory holds for India in the short-run. Hakro (2009) used multivariate time series on data from Pakistan. The estimates of vector autoregressive (VAR) model demonstrate that causality link of deficits is flowing from budget deficits to prices to interest rate to capital flows to exchange rates and to trade deficits. Another technique used by Vyshnyak (2000) when he employed cointegration and Granger-causality tests for the economy of in Ukraine on quarterly data and showed that budget deficit and current account deficit are cointegrated, and a government budget deficit Granger-causes a current account deficit. The Error Correction Model (ECM) approach was employed by Akbostancı and Tunç (2002) to study the hypotheses between the budget deficit and trade deficit for Turkey between 1987–2001 period. They showed that there is a long-run relationship between the two deficits. Also the short-run model yielded that worsening of the budget balance worsens the trade balance.

Other authors found a bi-directional causality relationship between the budget deficit and the current account deficit. Lau and Baharumshah (2004) discuss the on-going debates about twin deficits existence in Malaysia for the period (1975-200) using the techniques of Toda and Yamamoto (1995). The empirical result reveals the presence of bi-directional causality between the two deficits in Malaysia. Mukhtar *et. al*, (2007) used the ECM strategy and Granger causality tests to empirically test the twin deficit hypothesis in Pakistan using quarterly time-series data for the period 1975-2005. They confirmed the existence of long-run relationship between the two deficits, and that bi-directional causality runs between the two variables. In addition, Mehrara and Zamanzadeh (2011) examined the relationship between government current budget deficit and non-oil current account deficit for Iranian economy during the period 1959-2007 based on cointegration analysis and vector error correction model (VECM). Results shows positive relationship between government current budget deficit and non-oil current account deficit. Moreover, Granger causality tests show there is bidirectional relationship between the two variables.

It is worth to mention that studies on that topic are rare for the region except that done by Alkswani (2000) who tried to analyze the relationship between the budget and trade deficits in an open petroleum economy. The economy of Saudi Arabia is taken as an example. The data cover the period from 1970 to 1999. This study tries to test the Ricardian equivalence and the Keynesian proposition. The Ricardian equivalence argues that the budget and trade deficits are not correlated, whereas the Keynesian proposition confirms the existence of a positive relationship between the two deficits. The results of the direction of the causality show that budget deficit causes trade deficit.

Yanik (2006) investigated the validity of the twin deficits hypothesis for the Turkish quarterly data over the 1988:1-2005:2 periods using VAR model and Granger causality test. The results suggested that current account and budget deficits move together in the long run and the causality runs from the former to the latter.

On the other hand, Kulkarni and Erickson (2001) found no evidence of twin deficits occurring in case of India, Pakistan and Mexico during the period (1969-1997). In fact there was no evidence of causality running in either direction. One reason for this could be that the budget deficit and trade deficit values for Mexico have fluctuated wildly and there were some problems in getting a long run data for Mexican economy. In case of India there was a strong evidence of twin deficits. In Pakistan therefore there is an evidence of trade deficits creating the budget deficits. With three country cases showing different evidences, the twin deficit idea has a little or no evidence in this time period.

### 3. Theoretical Basis for the Twin Deficit hypothesis

In the economic literature, two main approaches are known to explore the relationship between current account and budget deficit; the Ricardian Equivalence and the Keynesian conventional proposition.

The first approach (The Ricardian Equivalence) denies any relationship between the budget deficit and the current account deficit. Since people are rational, then they know that the reduction in taxes is temporal and so they will save the extra money to pay for the future higher taxes. The national savings will not be affected. Therefore, the budget deficit has no effect on the current account deficit (Thomas and Abderrezak, 1988).

In contrast to the first approach, the Keynesian Proposition confirms the existence of positive relationship between budget deficit and current account deficit. Particularly, the twin deficits hypothesis states that a budget deficit leads to a current account deficit. And obviously a budget surplus will improve the current account deficit, while a budget deficit makes the government as a net borrower (Alkswani, 2000).

Economic reasoning for connection between budget deficit and current account balance may be traced from the national income identity.

$$Y = C + I + G + (X - M) \quad (1)$$

where Y is national income, C is private consumption, I is real investment spending in the economy such as spending on building, plant, and equipment, G is government expenditure on final goods and services, X is exports of goods and services, and M is imports of goods and services.

We define current account (CA) as

$$CA = (X - M) + F \quad (2)$$

where F stands for net income and transfer flows.

So, in addition to goods and services balance, the current account includes also net income received from or paid abroad. For simplicity, here we assume that net income from abroad is not large items in the current account. Although it is worth mentioning that if country has big foreign debt and high debt servicing payments, its income paid abroad should be a large negative item.

The current account shows the size and direction of international borrowing. When a country imports more than exports, it has a deficit in CA, which is financed by borrowing from foreigners. Such borrowing may be done by the government or by the private sector. Private firms may borrow by selling equity, land or physical assets. So, a country with current account deficit must be increasing its net foreign debt (or running down its net foreign wealth) by the amount of the deficit. A country with a deficit in CA is importing present consumption and/or investment (if investment goods are imported) and exporting future consumption and/or investment spending (Mukhtar *et. al*, 2007).

According to the national income identity, national saving in the open economy equals:

$$S = I + CA \quad (3)$$

It is worth to look at national saving more closely and distinguish between saving decisions made by the private sector and saving decisions made by the government. We have:

$$S = S^p + S^g \quad (4)$$

Where  $S^p$  is defined as the part of disposable income ( $Y^d$ ), which is saved rather than consumed. In general we have:

$$S^p = Y^d - C = (Y - T) - C \quad (5)$$

Where T stands for taxes collected by the government, Government saving is defined as difference between government revenue from tax (T) and government expenditures which consists of government purchases, G, and government transfers, Tr; mathematically,

$$S^g = T - G - Tr \quad (6)$$

By using the definition of national saving and using equation (3), we have:

$$S = S^p + S^g = (Y - T - C) + (T - G - Tr) = I + CA \quad (7)$$

We can rewrite identity (7) in a form, which is useful for analyzing the effects of government saving decisions on an open economy.

$$S^p = I + CA - S^g = I + CA - (T - G - Tr) \quad (8)$$

Equation (8) states that a country's private saving can take three forms: investment in domestic capital, purchases of wealth from foreigners (CA), and purchases of the domestic government's newly issued debt (G +Tr -T). Rearranging equation (8), we have:

$$CA = (I - S^p) + BB \quad (9)$$

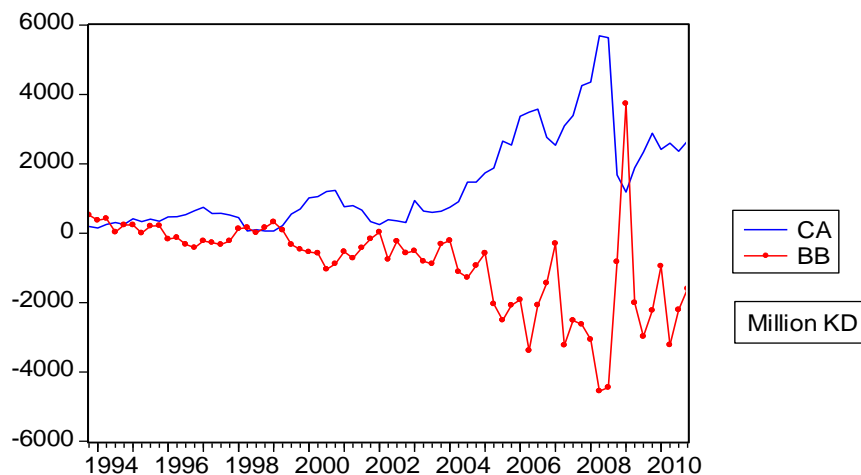
Where BB is budget balance and equals to (T - G - Tr). BB measures the extent to which the government is borrowing to finance its expenditures.

Looking at the macroeconomic identity (equation 9), we can see that two extreme cases are possible. If we assume that the difference between private savings ( $S^p$ ) and investment (I) is stable over time, the fluctuations in the public sector balance will be fully translated to current account and vice versa. Therefore, the twin deficit hypothesis will hold. The second extreme case is the Ricardian Equivalence Hypothesis (REH), in which if the government budget deficit increases then people respond by increasing their private saving, accordingly no effect will appear on current account (Thomas and Abderrezak, 1988).

#### 4. Data and Statistical Description

In this section we proceed with the empirical investigation of the twin deficits hypothesis for Kuwait data over the quarterly sample period (1993:4-2010:4) which obtained from International Financial Statistics (IFS) and the Central Bank of Kuwait ([www.cbk.gov.kw](http://www.cbk.gov.kw)).

**Figure (1): Current Account and Budget Balance in Kuwait (1993:4-2010:4)**



Kuwaiti current account (CA) witnessed a complete series of surplus during the period 1993:4 - 2010:4. However, CA shows big fluctuations during the period of study. It reached its maximum value in 2008:2 reaching a value of 5,687 million KD. The minimum surplus was reached in 1998:2 (a value of 60 million KD).

Regarding budget balance, it shows great fluctuations during the period of study. Most of the time, about 77% of the period, budget balance was in a deficit case. Starting in 2002:2, the budget balance shows continuous deficit, except 2009:1. The highest value of deficit was recorded in 2008:3, a value of 4,446 million KD. It worth noticing that the largest deficit in the budget balances was registered in the quarter that follows the one that witnessed the largest current account surplus ever.

## 5. Methodology

Economic theory provides ample explanations of the possible interrelationships between current account and budget balances. However, their validity appears to be an empirical issue. Following the recent literature we investigate the twin deficits hypothesis by employing a number of econometric techniques. First, we test the stationarity of the variables using Augmented Dickey Fuller (ADF) test. Second, we test cointegration of the variables using Johansen method. Then, we proceed with the Vector Autoregression (VAR) methodology to estimate the relationship between the variables of interest. This model treats all variables on an equal footing, and there is no priori distinction between endogenous and exogenous variables. From the VAR model, we will derive the Impulse Response Function (IRF). Finally, we will determine the Granger-causality directions.

### Unit Root Test

A test of stationarity that has become widely popular over the past several years is the unit root test. The Augmented Dickey–Fuller (ADF) test is one of the famous unit root tests to check the stationarity of economic variables.

Many economic time series may be non-stationary and need to be differenced (d) times until reaching stationary. Then, a time series (like Y) is said to be integrated of order (d), denoted by  $Y \sim I(d)$ . To perform a formal test of stationarity, the Augmented Dickey Fuller (ADF) test will be utilized.<sup>1</sup> The following regression equation is estimated:

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \alpha_2 Y_{t-1} + \sum_{j=2}^q \alpha_j \Delta Y_{t-j+1} + \varepsilon_t \quad (10)$$

where  $Y_t$  is a macroeconomic variable at time  $t$ ,  $\varepsilon_t$  is the disturbance term that is generated from a white noise process and is assumed to be independently and identically distributed with zero mean and constant variance.

In other words, the first difference of  $Y_t$  is regressed against a constant, a time trend ( $t = 1, 2, \dots, T$ ), the first lag of  $Y_t$ , and, if necessary, lags of  $\Delta Y_t$ . Sufficient lags of  $\Delta Y_t$  must be included to ensure no autocorrelation in the error term. Hence, the Schwarz Information Criterion (SIC) test would be utilized to confirm that autocorrelation is not present.

If a unit root (non-stationarity) exists, then  $\alpha_2$  would not be statistically different from zero. The test for a unit root is based on the t-statistics on the coefficient of the lagged dependent variable  $Y_{t-1}$ ;  $\alpha_2$ . This has to be compared with specific calculated critical values. If the calculated value is greater than the critical value, then the null hypothesis of a unit root is rejected, and the variable is taken to be stationary.

### Cointegration Test

Cointegration means that despite being individually nonstationary, a linear combination of two or more time series can be stationary. There are three main methods for testing cointegration: The Engle-Granger two-step method, the Johansen procedure, and the Phillips-Ouliaris Cointegration Test.

The Maximum Likelihood procedure (Johansen's test), suggested by Johansen (1988 and 1991) and Johansen and Juselius (1990), is preferable when the number of variables in the study exceeds two variables due to the possibility of existence of multiple cointegrating vectors (Alkswani, 2000). The advantage of Johansen's test is not only limited to multivariate case, but it is preferable than Engle-Granger approach even with a two-variable model (Gonzalo, 1994).

Two statistic tests used to determine the number of cointegrating vectors; the Trace test and the Maximal eigenvalue test. The first one tests the null hypothesis that the number of cointegrating vectors equals or less than ( $r$ ). This test is calculated as follows:

$$Trace = -T \sum_{t=r+1}^P \ln(1 - \hat{\lambda}_t)$$

<sup>1</sup> However, an informal method could be used; by looking at a time plot of the variable and checking if there is any obvious trend in the data.

Where  $\hat{\lambda}_{r+1}, \dots, \hat{\lambda}_p$  are the  $(p - r)$  smallest estimated eigenvalues. The second test ( $\lambda_{\max}$ ), examines the null hypothesis that there is  $(r)$  of cointegrating vectors against the alternative that  $(r+1)$  cointegrating vectors. This test is calculated as follows:

$$\lambda_{\max}(r, r+1) = -T \ln(1 - \hat{\lambda}_{r+1})$$

### Vector Autoregression

The Vector Autoregression (VAR) model is used to estimate the relationship between a group of variables. This model treats all variables on an equal footing, and there is no priori distinction between endogenous and exogenous variables. In addition, all variables are treated symmetrically by including lags of the dependent variable itself and lags of other variables in the model. The information criteria like Akaike Information Criterion (AIC) or Schwarz Information Criterion (SIC) will be used to choose the appropriate lag length for the VAR model.

VAR model for a system that consists of two variables;  $X$  and  $Y$ , and with two lags can be written as:

$$X_t = \alpha_{10} + \beta_{11}X_{t-1} + \beta_{12}X_{t-2} + \gamma_{11}Y_{t-1} + \gamma_{12}Y_{t-2} + \varepsilon_{1t}$$

$$Y_t = \alpha_{20} + \beta_{21}X_{t-1} + \beta_{22}X_{t-2} + \gamma_{21}Y_{t-1} + \gamma_{22}Y_{t-2} + \varepsilon_{2t}$$

In general, the resulting VAR model in matrix notation, with  $p$  lag is

$$y_t = \alpha + \Phi_1 y_{t-1} + \dots + \Phi_p y_{t-p} + \varepsilon_t \quad (11)$$

where  $y_t$  and its lagged values are vectors of endogenous variables;  $\varepsilon_t$  is a vector of non-autocorrelated disturbances; and  $\Phi$ 's are matrices of unknown coefficients to be estimated.

### Impulse response function

This technique involves measuring unexpected changes in one variable  $X$  (the impulse) in time  $t$  and predicting its effect on the other variable  $Y$  in time  $t, t+1, t+2, \dots$  (the responses). The impulse response function (IRF) defines the response of the dependent variable in the VAR model to shocks in the error terms. In other words, the IRF detects the impact of a one time shock in one of the innovations on current and future values of the endogenous variables. The general form for the IRF would be:

$$y_t = \alpha + \varepsilon_t + \Theta_1 \varepsilon_{t-1} + \Theta_2 \varepsilon_{t-2} + \dots + \Theta_i \varepsilon_{t-i}$$

where  $y_t$  is a vector of the considered dependent variables,  $\alpha$  is a vector of the constants,  $\varepsilon_t$  is a vector of innovations for all variables that have been included in the VAR model, and  $\Theta_i$  is a vector of parameters that measure the reaction of the dependent variable to innovations in all variables included in the VAR model.

However, in case of two variables ( $Y_t$  and  $X_t$ ), the form for the IRF would be:

$$Y_t = \alpha_1 + \varepsilon_{Y,t} + \eta_1 \varepsilon_{Y,t-1} + \eta_2 \varepsilon_{Y,t-2} + \dots + \eta_i \varepsilon_{Y,t-i} \quad (12)$$

$$X_t = \alpha_2 + \varepsilon_{X,t} + \phi_1 \varepsilon_{X,t-1} + \phi_2 \varepsilon_{X,t-2} + \dots + \phi_i \varepsilon_{X,t-i} \quad (13)$$

Equations 12 and 13 express how the dependent variable,  $Y_t$  or  $X_t$ , responds to previous innovations that happened to the endogenous variables included in the VAR model ( $\varepsilon_X$ 's and  $\varepsilon_Y$ 's). However, the coefficients ( $\phi$ 's and  $\eta$ 's) present the amounts of responses.

### Granger Causality Test

Granger causality is a term for a specific notion of causality in time-series analysis (Granger, 1969). The idea of Granger causality is that a variable  $X$  Granger-causes  $Y$  if  $Y$  can be better predicted using the histories of both  $X$  and  $Y$  than it can using the history of  $Y$  alone.

$$\Delta Y_t = \eta_1 + \sum_{i=1}^n \alpha_i \Delta X_{t-i} + \sum_{j=1}^n \beta_j \Delta Y_{t-j} + u_{1t} \quad (14)$$

$$\Delta X_t = \eta_2 + \sum_{i=1}^n \lambda_i \Delta X_{t-i} + \sum_{j=1}^n \delta_j \Delta Y_{t-j} + u_{2t} \quad (15)$$

Where  $u_{1t}$  and  $u_{2t}$  are the disturbance terms that are not correlated with one another,  $\eta_1$  and  $\eta_2$  are constant terms, and  $\alpha_i, \beta_j, \lambda_i, \delta_j$  are coefficients. The reported F-statistics are the Wald statistics for the joint hypothesis. For example, testing the null hypothesis whether  $\alpha_1 = \alpha_2 \dots = \alpha_n = 0$ .

The Granger-causality approach allows determining the short-run or forecasting direction of the relations between two variables;  $X$  and  $Y$ . It is worth noting that, the Granger-causality tests based on stationary variables, ignores the long-run effects.

If we let X to represent budget balance (BB) and Y to represent current account (CA), then Granger- causality test has four hypotheses: BB Granger-cause CA, CA Granger- cause BB, Causality goes in both directions, and finally CA and BB are independent.

## 6. Empirical Results

### Unit Root Test Results

Stationarity of the variables - budget balance (BB) and current account (CA) - was tested using Augmented Dickey-Fuller (ADF) test. Tables (1-a) and (1-b) report the results which suggest the rejection of the unit root null hypothesis of stationarity for both variables at the level (except for CA when the time trend was added to the regression model). However, all variables were found stationary at their first differences.

**Table 1-a: Unit Root Test Results (with intercept)**

Variables	ADF (level)		ADF (first difference)	
CA	-1.825940	[0]	-7.243703	[0] ***
BB	-1.322786	[8]	-3.328976	[7] **

**Table 1-b: Unit Root Test Results (with intercept and time trend)**

Variables	ADF (level)		ADF (first difference)	
CA	-3.440665	[1] *	-7.187481	[0] ***
BB	-1.944804	[8]	-3.369996	[7] *

- 1) The results of Table 1-a are based on assuming the existence of a constant in the regressions, while the results of Table 1-b are based on assuming the existence of a constant and a time trend in the regressions.
- 2) The \*, \*\*, and \*\*\* indicate rejection of the null hypothesis of unit root at 10%, 5%, and 1% significant levels, respectively.
- 3) The lag length of the ADF regression is specified in brackets [ ].
- 4) The lag length of the ADF regression is based on the Schwarz Information Criterion (SIC) for appropriate lag length.

### Cointegration Test Results

The results of trace and maximal values tests are reported in Table (2). They suggest the rejection of the null hypothesis of no cointegration at 1% level. This means that the budget balance and the current account are cointegrated and that there is a stationary linear combination between the two variables. This might suggest the validity of the twin deficit hypothesis. However, we will wait to see the results of the other tests and see whether they will confirm the twin deficit hypothesis too or not.

**Table 2: Johansen Cointegration Test Results**

Trace test:			
Null	Alternative	Trace Statistic	5% critical value
r = 0	r >= 1	31.770 ***	15.495
r <= 1	r = 2	2.149	3.841
Maximum Eigenvalue test:			
Null	Alternative	Max-Eigen Statistic	5% critical value
r = 0	r = 1	29.621 ***	14.265
r = 1	r = 2	2.149	3.841

The \*, \*\*, and \*\*\* indicate rejection of likelihood ratio tests at 10%, 5%, and 1% significance levels, respectively.

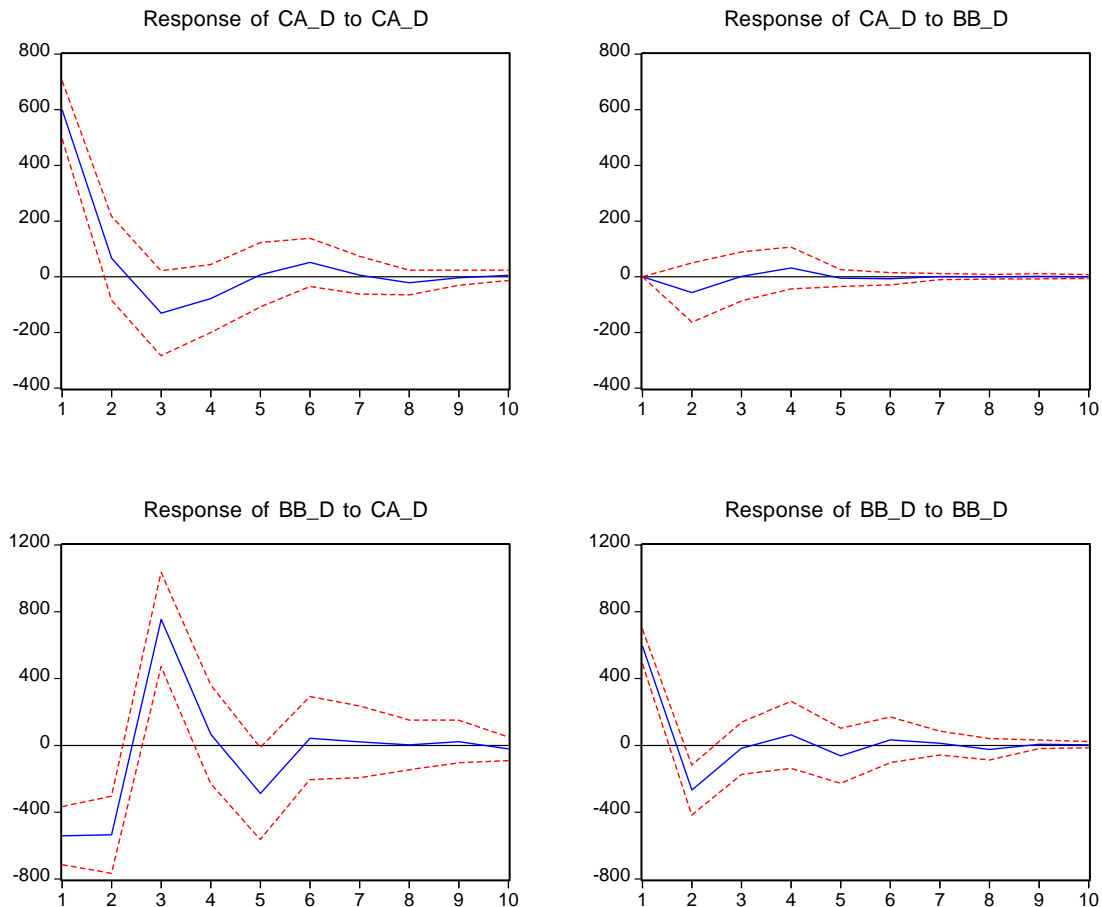
### VAR and IRF specifications Results

IRF is another way to check the relationship between budget balance and current account as it particularly explains how a shock in one of these variables would affect the course of the other variable.

First, this paper estimates VAR model that includes all variables that help estimating the shocks to each variable. Based on that, the IRF can be constructed. The impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables. Figure 3 shows the responses of each variable to shocks in other variables included in the model. In Figure 3, CA\_D and BB\_D were used to represent the first difference in the current account and budget balance, respectively<sup>2</sup>.

**Figure 2: The Impulse Response Function Results**

Response to Cholesky One S.D. Innovations  $\pm 2$  S.E.



Row 1 of Figure 2 shows the responses of budget balance to shocks to the variable itself and to shocks in current account, respectively. Budget balance responds negatively to a shock in current account. That is an improvement in the current account position (an increase in the surplus of current account) usually driven by the increase in the surplus of the trade balance will cause budget balance surplus to decrease or its deficit to increase. This why, we believe that the direction of causality is going from the current account to budget balance and not the other way. However, this shock has its maximum effect in the third quarter and it disappears gradually.

Row 2 of the same Figure shows the responses of CA to shocks to BB and CA, respectively. CA responds negatively to a shock in BB. The reason for that is because an increase in the BB involves more spending on the foreign sectors (importing more) causing a decrease in the budget balance surplus and therefore a decrease in the current account position. However, it is interesting to know how the picture would change if we replace current account by trade balance. Surprisingly, the results of the IRF were almost the same (results were not shown and available upon request.)

<sup>2</sup> The first difference was used to represent considered variables since variables at level were found non-stationary.



The results of the IRF do not support the twin deficit hypothesis; which requires a positive relationship between current account and budget balance. However, the relationship between the two variables was found negative for the Kuwaiti data; a result that does not go with the assumptions of the twin deficit hypothesis as explained in the introduction of this paper.

### Granger Causality Test Results

The empirical literature investigating the twin deficits hypothesis often tests for Granger-causality between current account and budget deficits. CA is said to be Granger-caused by BB if BB helps in the prediction of CA, or equivalently if the coefficients on the lagged BB statistically significant.

**Table 3: Granger Causality Results (the null hypothesis and the significant level)**

The null hypothesis	The p-value for the significant level	The results
BB does not Granger Cause CA	37%	cannot be rejected
CA does not Granger Cause BB	1%	Rejected

**Table 4: Granger Causality Results (directions of causality)**

BB	←	CA
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\*: Arrows indicate the direction of Granger causality between the variables.

Granger-causality test results are consistent with our prediction. The test reveals that the causality direction goes from current account to budget balance and not the other way. This proves that the expansion in current account (driven by the boost in trade balance surplus) will encourage the government to increase its spending, and budget deficit will increase or the surplus will decrease as proven in the results of the IRF.

So, from our results, we can conclude that the twin deficit hypothesis was not confirmed for the Kuwaiti data over the time period of our analysis. Alkswani (2000) confirm the same result for Saudi Arabia; an economy that is similar to Kuwait in that it is oil based economy.

### 7. Conclusion

The main objective of this paper is to present the theoretical argument of twin deficit hypothesis, review the existing literature, and examine the twin deficit hypothesis to the Kuwaiti economy. To analyze the relationship between the two variables over the period 1993:4-2010:4, the paper tests the stationarity of the two variables, estimates the cointegration regression (the Johansen cointegration test), applies the VAR model, estimates the IRF, and tests for existence and the direction of causality.

The results of this paper confirm the existence of the long-run equilibrium relationship between budget balance and current account. This relationship was found negative that is *BB* responds negatively to a shock in *CA*. In other words, an improvement in the current account position (usually driven by the increase in the surplus of the trade balance) will cause budget balance surplus to decrease or its deficit to increase. This explains why the effect comes from *CA* to *BB* (the result of the causality test). The other direction (that comes only from budget balance and current account) was not proven. These results prove that the twin deficit hypothesis (as presented by the theoretical model) was not confirmed for the Kuwaiti economy over the time period of our analysis.

It is worth to mention that the same result was found by Alkswani (2000) who applies the twin deficit hypothesis to the Saudi economy. Based on the results found by our paper and by Alkswani, we can conclude that the twin deficit hypothesis may not be applied to countries that are oil-based economies.

The economic implications of this paper are very important. The increase in current account position (driven basically by the surplus of the trade balance) encourages the government to spend more causing the budget deficit to increase. Historical data shows that fluctuations in trade balance and current account are large in oil countries since they are sensitive to the fluctuations in the oil prices. Therefore, the government should be cautious of falling in a position of two deficits; current account and budget balance.

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