

Twin Deficits: New evidence from a Arab world

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Abstract

We test the relationship between the current account and fiscal policy for a group of small open economies. Specifically, we test the viewpoint of a Ricardian infinite-horizon representative agent model in which lower public savings are met by equal increases in private savings, and as a result the current account does not respond to the changes in government spending, against a Keynesian's conventional viewpoint in which a fall in public savings has an adverse effect on the current account balance. Evidence from a panel data analysis supports the conventional theory of a positive relationship between fiscal and external balances, but after controlling for inflexibilities and a measure to account for the state of development within the economies, the sensitivity of the current account to changes in the fiscal position reduces. Our estimates show that a rise by one percent of the fiscal-deficit- induces the current-account- to deteriorate by between 0.45 to 0.85 percentage points.

Keywords: Panel data, external balance, fiscal balance, deficits, current account, fiscal policy, Twin deficits.

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Introduction

Governments' dependency on fiscal policy, in order to achieve the economic goals of stabilization and growth, has been a common aspect of many developed and developing countries over time, accompanied — in most cases — by a large government fiscal deficit. One of the most significant current economic debates is the nature of the connection between fiscal policy and the current account. This has been fuelled by the steady increase in the US trade deficit to around 6 percent of its GDP in 2008, and the more recent swing in the US fiscal balance from surplus to a large deficit. A large and growing body of literature has investigated, theoretically and empirically, the association between fiscal policy and current account, mostly in terms of fiscal and external deficits, also called the twin deficits. The literature on this subject is generally centred on two main theoretical ideologies, the Keynesian conventional approach, also called the twin deficit hypothesis (TDH), in which a fall in public savings has an adverse effect on the current account balance, and the Ricardian equivalence hypothesis (REH) in which lower public savings are met by equal increases in private savings, and as a result the current account does not respond to the changes in government spending and consequently its general fiscal balance.

The issues involved have important policy implications. Assume that the essential reason for a rising current account deficit is indeed the growing budget deficit. In this case, policy makers may focus on reducing the budget deficit (by decreasing government expenditures or increasing taxes) in order to resolve the current account problem that has unfavourably affected several sectors of the economy such as manufacturing industries and agriculture. However, if such a view about the causal role of the budget deficit is erroneous, then a cutback in the budget deficit may not resolve the current account predicament and, furthermore, it will deflect scarce economic resources and attention from more relevant and urgently needed policy option.¹

As a matter of fact, the discussion about the relationship between current account and fiscal balances is a very controversial one. There are economists on both sides of the argument who may have strong reasons, supported by more than one econometric methodology and a lot of empirical applications, for their opinion. Volcker (1984), for example, proposed that the large fiscal deficits, given the relatively low domestic savings rate, puts upward pressure on the real interest rates. Those high rates make the home country a relatively attractive place in which to invest and thus lead to an inflow of

¹ See for instance (Belongia and Stone, 1985) and (Darrat, 1988)

foreign capital. While easing some of the strain on domestic credit markets and helping to finance the budget deficit, the foreign capital flows appreciate the value of the home country's currency relative to the currencies of the trading partners. This, in turn, diminishes the home country worldwide merchandise trading position, or in other words, leads to an increasing current account deficit.

Enders and Lee (1990) developed a two-country micro-theoretical model consistent with the REH, in that model, an unconstrained VAR analysis for the U.S. data is consistent with the theoretical result that the increasing government spending, irrespective of the means of finance, can be expected to induce a current account deficit, which appears to be inconsistent with the REH. Moreover, Jeffrey A. Rosensweig (1993) has examined the relationship between U.S. fiscal deficits, exchange rates, and trade balances. Using a five-variable VAR system, the results provide some evidence that growing government deficits appreciate the dollar, and support the "twin deficit" notion that government deficits contributed to trade deficits in the 1980s. Thus, fiscal policy appears to have a considerable role to play in U.S. trade balance adjustment. Similarly, Vamvoukas (1997) used co-integration analysis, error-correction modelling and Granger causality to evaluate the validity of both the TDH and the REH for the Greek economy and found a one-way causality from budget deficit to current account deficit, and the error-correction modelling evidence supports robustly the TDH proposition in the short and long run.

Additionally, Normandin (1999) examined the TDH by measuring the responses of the external deficit to the changes in the budget deficit induced by Blanchard's overlapping generation model. He found that, using generalized method of moments (GMM) estimations, unit root tests, and co-integration tests for the Canadian and US economies, the great persistence of the budget deficits exerts large positive and statistically significant effect on the current account deficit. This confirms that the REH is rejected. Likewise, Khalid and Guan (1999) used co-integration analysis to determine the causal relationship between current account and budget deficits and its direction, using a sample of annual time series data from five developed and five developing countries. The results from co-integration appear to suggest that a high correspondence between the two deficits in the long run is more likely to occur in the developing countries than the developed ones. Results on the Granger test of causality support the existence of a causal relationship between the current account deficit and the budget deficit in mixed direction for developing countries. The evidence suggests that current account deficits cause budget deficits for Indonesia and Pakistan, whereas the reverse is true for Egypt and

Mexico. The data does not support any causal relationship for UK and Australia and supports only some weak evidence of bi-directional causality for Canada and India.

By the same token, Piersanti (2000) used an optimizing general equilibrium model to show the theoretical relationship between the fiscal and current account deficits for OECD countries. His empirical investigation, using an econometric equation based on the forward-looking expectations model, strongly supports the view that current account deficits have been associated with expected future budget deficits during the 1970–1997 periods. Furthermore, the empirical outcomes of examining the causality of these two deficits by testing for Granger non-causality using causality tests initially developed by Toda and Phillips (1993) on data from a sample of twenty developed and developing countries, have provided robust evidence of causality (unidirectional or bi-directional) between the twin deficits for developing countries, but less persuasive results for developed countries. a unidirectional causality from budget deficit to current account deficit for Israel, a unidirectional causality from current account deficit to budget deficit for Korea and a feedback relation between budget deficit and current account deficit for Thailand (Kouassi et al., 2004).

In addition, Saleh et al. (2005) supported the TDH that there is a long-run relationship between current account imbalances and budget deficit for Sri Lanka during the period 1970 to 2003 using autoregressive distributed lag (ARDL) model. Their empirical results also show that the direction of causality runs from the budget deficit to the current account deficit. More recently, Baharumshah et al.(2006) have examined the TDH in the ASEAN countries and found that there is a long run relationship between budget and current account deficits. In contrast to Kouassi et al. (2004), the TDH fits well for Thailand since the causality runs from budget deficit to current account deficit. For Indonesia, the causality runs in an opposite direction while the empirical results indicate that a bidirectional pattern of causality exists for Malaysia and the Philippines. They also found indirect causal relationship runs from budget deficit to higher interest rates, and higher interest rates leading to the appreciation of the exchange rate, which in turn leads to the widening of the current account deficit.

On the other side of argument, Kearney and Monadjemi (1990) employed VAR analysis also on quarterly data from eight countries over the period of floating exchange rates from 1972:i-1987:iv to investigate the relationship between fiscal and current account balances. Their outcome is consistent with a transitory twin deficit association that is not invariant to the government's financing decision and does not persist over time. Also, Mohammadi (2004) used a finite-horizon open-economy macroeconomic

model to examine the effect of fiscal policy on the current account balance. His model indicates two results: firstly, a fall in fiscal surplus has no adverse effect on the current account balance; secondly, the increase in government expenditure financed by bonds exerts a larger adverse effect on the current account balance than a tax-financed alternative

Similarly, Erceg et al. (2005) examined the effects of two alternatives fiscal shocks: a rise in government consumption expenditure, and a reduction in the labour income tax rate using US data. They have argued that the fiscal deficit has a relatively small effect on the US current account balance, regardless of whether the source is a spending increase or tax cut. They conclude that a rise in the fiscal deficit of 1 percentage point of gross domestic product (GDP) induces the trade balance to deteriorate by only 0.2 percentage point of GDP or less. Also, Marinheiro (2008) examined the validity of the TDH for Egypt. He concluded that there is presence of a weak long-run relationship between the budget deficit and the current account deficit rejecting the TDH. He also found evidence in favour of a reverse Granger-causality running from the external deficit to the budget deficit and presented evidence in favour of a high degree of capital mobility.

More recently, Kim and Roubini (2008), also by VAR analysis, have studied empirically the effects of fiscal policy (represented by government budget deficit shocks) on the current account and real exchange rate in U.S. during the flexible exchange rate regime period. Contrary to the predictions of most theoretical models, their results suggest that an expansionary fiscal policy shock, or a government budget deficit shock, improves the current account and depreciates the real exchange rate. Therefore, “twin divergence” rather than “twin deficit” of fiscal and current account balances is found, which is explained by the occurrence of output shocks that are prevailing on fiscal shocks and appear to drive the co-movement of the current account and the fiscal balances. Furthermore, the empirical analysis shows that the current account improvement resulted from a partial Ricardian behaviour of private saving (that is, private saving increases) and a fall in investment (a crowding-out effect which was likely to be the result of an increase in the real interest rate), while the real exchange rate depreciation was mainly the result of a nominal exchange rate depreciation.

To sum up, the theoretical work on the correlation between variation in the components of fiscal policy and the current account balance has been based upon two types of competing theories. First, the REH, which extracts the important macroeconomic relationships from the microeconomic foundations of individual optimizing behaviour.

The second theory is the TDH, which has utilized macroeconomic models that are constructed in form of behavioural relationships, to describe how the economy works in aggregate ignoring the behaviour of the agents who make up the economy. It is obvious that there is no unanimity regarding the relationship between fiscal policy and current account. Some argue that prolonged fiscal expansion contributes to current account imbalances, see for example Parikh and Rao (2006), Mollick (1999) and Kasa (1994), and others are in favour of a weak relationship between fiscal and external deficits, see for instance Kearney and Monadjemi (1990), and Kim and Roubini (2008).

In our study we examine, empirically, the validity of these two hypotheses for developing countries, focusing on the Arab world². So, the purpose of this paper is to test these two hypotheses of the relationship between fiscal policy and current account and introduce some new evidence using panel data analysis on the annual data set from the Arab world over the period 1970-2007. The rest of paper is organized as follows. In the next section, the theory of that relationship is shown. The third section presents the empirical model. The fourth part is devoted to the discussion of the estimation techniques and data description. The fifth section presents the empirical results and conclusions.

The Theory

To elucidate the relationship between fiscal policy and current account in a small open economy, it is useful to start with the gross domestic product *GDP* accounting identities. This is the typical framework used to trace the link between current account and fiscal deficits in other open economy. First, individuals dispose of *GDP* either as consumption *C*, saving *S*, or taxes *T*;

$$GDP = C + S + T \quad (1)$$

Second, the gross domestic product *GDP* is the output produced by the economy, and it is the sum of output of domestic goods and services consumed by individuals *C*, investment *I*, government expenditure *G*, and foreigner's consumption of the domestic goods and services *EX* minus the individuals consumption of imported foreign goods and services *IM*. We can thus write the gross domestic product *GDP* accounts identity as

$$GDP = C + I + G + EX - IM \quad (2)$$

Equalizing equations (1) and (2), we get

² These countries are Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, and United Arab Emirates.

$$C + S + T = C + I + G + (EX - IM)$$

$$C + S + T = C + I + G + CAB \quad (3)$$

Where CAB denotes the balance of current account. After cancelling out C from both sides and rearranging (3) yields

$$CAB = (T - G) + (S - I) \quad (4)$$

Equation (4) shows that, for a given saving rate, a fiscal deficit ($T - G$) will either crowd out private investment I or lead to an inflow of foreign capital or both. By definition, anything that affects fiscal deficit, investment, or saving, in turn affects both capital flows and trade deficit. In other words, one can conclude from equation (4) that if saving and investment remains stable over time, then changes in policies that worsen the fiscal balance will worsen the current account balance by an equal amount, unless such changes also affect private saving or investment. According to Dornbusch (1976), interest rates and the degree of capital mobility are the key linkages between domestic activity and trade account. Suppose a small open economy is running fiscal expansion (by increasing fiscal deficit), this action puts upward pressure on the country's interest rate. In that economy with perfect capital mobility, as soon as the domestic interest rate increases above the world rate, immediately portfolio holders worldwide shift their wealth to take advantage of the new rate. As a result an amount of foreign (financial) capital will flow into the country, but in order for foreigners to buy the bonds in this country, they must first acquire its currency. Hence, the capital inflows cause an increase in foreign demand for that currency in the foreign exchange market, causing it to appreciate. This appreciation makes exports more expensive to foreigners and imports cheaper to people at home, and thus causes trade account surplus to fall or its deficit to increase under float exchange rate regime.

Assume again the same small open economy running a fiscal deficit, but with a fixed nominal exchange rate regime (just as the countries under investigation). That is, fiscal policy crowds out net exports by causing the nominal exchange rate to appreciate forcing the central bank to intervene to hold the exchange rate constant. It buys the foreign money, in exchange for domestic money. This intervention causes the home country money stock to increase and interest rate starts to decline. Because the economy is small and open, when the interest rate tries to fall below world interest rate as a result of increasing money supply, savers will invest abroad. This capital outflow causes the exchange rate to fall, which causes net exports to increase and trade surplus/deficit to

increase/decrease. That process comes to the end when home interest rate has been pushed back up to the initial level.

From the viewpoint of national saving, the budget deficit, caused by the expansionary fiscal policy, leads to an expansion of aggregate demand and hence income. The desired private saving rises as it responds to rising interest rate and increasing income, but by less than the tax cut, so that desired national saving declines. It follows that, for a closed economy, the expected real interest rate would have to rise to restore equality between desired national saving and investment demand. The higher real interest rate crowds out investment, which shows up in the long run as a smaller stock of productive capital. Therefore, in the language of Franco Modigliani (1961), the public debt is an intergenerational burden in that it leads to a smaller stock of capital for future generations. In an open economy, a small country's budget deficit would have negligible effects on the real interest rate in international capital markets. Therefore the home country's decision to substitute a budget deficit for current taxes leads mainly to increased borrowing from abroad, rather than to a higher real interest rate³. That is, budget deficits lead to current-account deficits (Barro, 1989). This insight from macroeconomic theory has been captured by two main models, the REH and TDH.

Ricardian Equivalence Hypothesis

Starting with constant population, a two-period representative-agent model with zero initial private bonds, a balanced government's budget in every period and lump-sum taxes, given the interest rate r , individuals will make the same consumption decisions whether the government's budget is balanced or unbalanced each period because every pound of taxes delayed today must be paid with interest tomorrow by the same taxpayers alive today. As a result, a government deficit cannot affect consumer choices. Private saving plus government saving is the national saving, thus, given that both government expenditures and interest rate, national saving schedule does not change even though a change in the timing of taxes changes government saving. The reason is that a private saving change exactly offsets any change in government saving. (e.g. if the government lowers taxes by say one pound on date 1 and therefore raises them by that one pound plus the interest payment on date 2, the private sector will simply raise its own date 1 saving by one pound so that it can pay its higher date 2 tax bill without disturbing the optimal consumption plan it is following). Consequently, given that the level of investment is the

³ Expected real interest rates rise for the home country only if it is large enough to influence world markets, or if the increased national debt induces foreign lenders to demand higher expected returns on this country's obligations.

same over time, the current account balance (CAB) should remain the same if the change in private savings S offsets the change in government savings ($T - G$). It follows that, if the TDH is not supported, then the government fiscal balance variable (GFB) have no explanatory power.

Twin Deficits Hypothesis

In the language of Barro (1974), the inspiration of finite horizons, motivated by the finiteness of life, is dependent on the life-cycle models. In these models individuals capitalize only the taxes that they expect to face before dying. Consider a deficit-financed tax cut, and assume that the higher future taxes occur partly during the typical person's expected lifetime and partly thereafter. Then the present value of the first portion must fall short of the initial tax cut, since a full balance results only if the second portion is included. Hence the net wealth of people currently alive rises and households react by increasing consumption demand. Thus, the desired private saving does not rise enough to fully offset the decline in government saving. A finite horizon seems to generate the standard result that a budget deficit reduces desired national saving. The argument works, however, only if the typical person feels better off when the government shifts a tax burden to his or her descendants. The argument fails if the typical person is already giving to his or her children out of altruism. In this case people react to the government's imposed intergenerational transfers, which are implied by budget deficits or social security, with a compensating increase in voluntary transfers.

Blanchard (1985) suggested a positive relationship between persistent budget deficits and a country's external debt. And he rejected the Ricardian argument by showing that utility maximizing tax-payers would behave in a different way under a finite horizon as opposed to the infinite horizon representative agent assumed by Ricardo. The conventional view of TDH, expressed by the finite-horizon overlapping generations model, proposes that a decline in public savings due to a tax cut, for a given path of government expenditures, increases private savings by an amount that is smaller than the initial tax cut. As a result, national savings decline. In an open economy with perfect capital mobility, however, real interest rates may not rise, but the increased borrowing from abroad may result in current account deficits. Consequently, assuming that the level of investment is constant over time, the current account balance CAB would change in the direction of the changes in the fiscal deficit, if the change in the private savings S does not offset the change in government savings ($T - G$). In that case, if the TDH is

supported, then the government fiscal balance variable GFB should have explanatory power.

The Empirical Model

We start from a naive econometric specification as in equation (4), which incorporates the TDH and REH views mentioned above. Since Arab countries, like many developing countries, have inefficient bond markets, they depend much more on central banks to finance the government spending program and their general budget deficits. We therefore add to equation (4) the growth rate of money supply as explanatory variable. By the same argument, since the current account highlights the relationship between an individual country and other countries, this can be partly controlled and two more variables, trade openness and capital mobility, allow for these effects to be controlled for. Moreover, in developing countries, the current account and budget balance could be influenced by economic productivity, so a Solow residual should be included as a gauge of total factor productivity⁴. Accordingly, the empirical model that captures the essential features of both theories, in the context of developing countries, is given by the following equation;

$$CAB_{it} = \alpha + \beta_1 GFB_{it} + \beta_2 GDS_{it} + \beta_3 GI_{it} + \beta_4 GMS_{it} + \beta_5 TO_{it} + \beta_6 CM_{it} + \beta_7 SR_{it} + \beta_8 D_{it} + u_{it} \quad (5)$$

Where:

CAB_{it} = Current Account Balance (Surplus/Deficit)

GFB_{it} = Government Fiscal Balance (Surplus/Deficit)

GDS_{it} = Gross Domestic Saving

GI_{it} = Gross Investment

GMS_{it} = annual Growth rate of Money Supply M2

TO_{it} = Trade Openness

CM_{it} = Capital Mobility

SR_{it} = Solow Residual of total factor productivity

⁴ See for instance Cuñado and Gracia (2005), Bussière et al. (2005)

D_{it} = Dummy variable for oil producing status which equals one if the country i is oil producer and zero otherwise.

u_{it} = error term.

i ($i = 1, \dots, n$) = Country index, and $n = 12$

t ($t = 1970, \dots, T$) = time ($T = 2007$)

The primary distinction between the two hypothesises of Ricardo and Keynes centres on the sign and significance of β_1 , which is the response of current account balance to a unit rise in the fiscal balance GFB as a mirror of fiscal policy. The TDH suggests that a rise in GFB (fiscal surplus) tends to improve the current account balance CAB , and thus $\beta_1 > 0$, while the REH predicts that $\beta_1 = 0$.

Data and the Estimation Technique

(a) Data:

The empirical investigation using the preceding model relies on a panel data set from Arab world countries⁵ with annual data over the 1970-2007 periods. The current account balance CAB ⁶, the government fiscal balance GFB , the gross domestic saving GDS and gross investment⁷ GI all are calculated in terms of national currencies as percent of GDP, whereas the annual growth rate of money and quasi money GMS is the measure used for money supply. The degree of trade openness TO is defined according to the following expression:

$$TO_{it} = \frac{(EX_{it} + IM_{it})}{GDP_{it}} \quad (6)$$

Where:

EX_{it} = Country i total exports of goods and services in time t .

IM_{it} = Country i total imports of goods and services in time t .

The Solow Residual SR is a measure of growth in total-factor productivity (TFP), and represents output growth not accounted for by the growth in inputs (Hornstein and

⁵ The sample consists of the following countries: Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, and United Arab Emirates.

⁶ The trade balance ($EX - IM$) is used as a proxy for the current account balance CAB_{it} .

⁷ We use gross capital formation as a proxy measure of gross investment in the economy.

Krusell, 1996), has been calculated from Cobb-Douglas production function (Cuñado and Gracia, 2005)

$$GDP_{it} = A_{it} L^{\alpha} K^{1-\alpha} \quad (7a)$$

$$SR_{it} = \log(A_{it+1}) - \log(A_{it}) \quad (7a)$$

Where A_{it} is the total factor productivity coefficient, L_{it} is the number of employed people and α is the labour share of GDP calculated as the value added⁸ of agriculture and mining activities to GDP ratio and K_{it} is the gross fixed capital formation and capital share is $(1 - \alpha)$. Capital mobility CM_{it} is measured as

$$CM_{it} = \frac{\sum (FDI_{outward} + FDI_{inward})_{it}}{GDP_{it}} \quad (8)$$

FDI , denotes the foreign direct investment inward and outward the country (Garretsen and Peeters, 2007).

(b) Estimation Technique:

We estimate equations (4) and (5) using a panel date technique that allows the intercepts, and error variances to differ freely across countries. Compared to single cross-section or time series data estimation, panel data estimation gives more informative data, more variability, more accurate inference of model parameters, greater capacity for capturing the complexity of human behaviour, less collinearity among the variables, more degrees of freedom and more efficiency (Baltagi, 2001) and (Hsiao, 2007). Panel data analysis introduces two essential models, fixed or random effects models; therefore the question is which one of them should be used?

In general, the fixed effects model is denoted as

$$Y_{it} = \alpha + \beta_k X_{it} + u_{it} \quad (9)$$

$$u_{it} = \mu_i + v_{it} \quad (10)$$

μ_i Are individual-specific, time-invariant effects (in a panel of countries, as in our case, this could include geography, climate, language ... etc.) and because we assume they are

⁸ We used value added of agriculture and mining activities here as a proxy of total labour compensation in the economy because it is intensive labour activity and the real figures of labour compensation in the countries under examination are not available.

fixed over time, so it is called fixed effect model. The random effects model assumes in addition that

$$\begin{aligned}\mu_{it} &\approx i.i.d.(0, \sigma_{\mu}^2), \\ v_{it} &\approx i.i.d.(0, \sigma_v^2)\end{aligned}\tag{11}$$

That is, the two error components are independent from each other. To check for any correlation between the error element μ_{it} and the regressors in a random effects model we use a Hausman test. That test compares the coefficient estimates from the random effects model to those from fixed effects model. If both estimators are consistent then they should converge to the true parameter values β_k in large samples. On the other hand, if μ_{it} is correlated with any X_{it} the random effects estimator is inconsistent, while the fixed effects estimator remains consistent. In this case we expect to see differences between the fixed and random effects estimates.

(c) Panel Unit Root:

We tested for stationarity using test based on this model:

$$\Delta y_{it} = \alpha_i + \delta_i t + \rho_i y_{i,t-1} + \sum \phi_{i\ell} \Delta y_{i,t-\ell} + \varepsilon_{it}\tag{12}$$

Δy_{it} = First difference operator and equal $y_{it} - y_{it-1}$

If $\rho_i = 0$, then y_{it} contains a unit root or non-stationary. If $\rho_i < 0$, then y_{it} is stationary.

$$H_0 : \rho_1 = \rho_2 = \dots = \rho_N = 0\tag{13}$$

$$H_1 : \rho_1 = \rho_2 = \dots = \rho_N = \rho < 0\tag{14}$$

To check whether the data are stationary or non-stationary, we reviewed the graphical data in figure (1) below (see appendix B) shows that the data for the most of the variables are mean reverting with almost no drift or time trend except Kuwait in 1990, because the Iraqi invasion, and some other small drifts with upward and downward oil prices especially in oil producer countries. In this paper, we test the null hypothesis of non-stationary panel data using Multivariate Augmented Dickey-Fuller (MADF) test proposed by Taylor and Sarno (1998). As can be seen, the results shown in table (1)

illustrate that the null hypothesis of non-stationarity has been rejected, that is meaning that all variables in the sample are stationary in some countries of the sample panel.

Table (1) Results of Multivariate Augmented Dickey-Fuller (MADF) test

<i>Number of lags</i>	1	2	3	4
CAB_{it}	124.547**	86.474**	73.065**	81.332**
GFB_{it}	250.536**	147.121**	88.108**	65.314**
GDS_{it}	63.138**	61.769**	92.280**	193.235**
GI_{it}	63.138**	61.769**	92.280**	193.235**
GMS_{it}	268.746**	113.017**	80.084**	75.380**
TO_{IT}	83.161**	70.7**	55.934**	80.573**
CM_{it}	218.924**	104.718**	67.702**	55.475**
SR_{it}	512.651**	316.553**	241.510**	201.584**
Critical values at 5%	24.045	24.360	24.699	25.065

The asterisks (**), denote rejection of the non-stationary hypothesis H_0 at 5% percent.

Table (2) Results of Im-Pesaran-Shin (IPS) test

<i>No. of lags</i>	1	2	3	4
CAB_{it}	-2.31***	-1.903**	-1.83*	-1.77
GFB_{it}	-2.249***	-2.944**	-3.986***	-1.860*
GDS_{it}	-1.849*	-1.611	-1.839*	-1.945**
GI_{it}	-1.849*	-1.611	-1.839*	-1.945**
GMS_{it}	-3.259***	-2.903***	-2.621***	-3.049***
TO_{IT}	-2.33***	-2.196***	-2.33***	-1.917**
CM_{it}	-3.231***	-2.401***	-1.991**	-1.945**
SR_{it}	-5.263***	-3.850***	-3.607***	-3.023***

Critical values at 1%, 5% and 10% are -2.040 -1.900, -1.810 and respectively. (***), (**) and (*) denote rejection of the non-stationary (null) hypothesis at 1%, 5% and 10% respectively.

Im et al. (2003) estimated the t-test for unit roots in heterogeneous panels; the (IPS) test allows for individual effects, time trends, and common time effects. Based on the mean of the individual Dickey-Fuller t-statistics of each unit in the panel, the IPS test

assumes that all series are non-stationary under null hypothesis; otherwise, the panel data set is stationary. Table (2) shows the results given by IPS test from which we can easily see that all series in the panel are stationary, even if the gross investment *GI* variable has unit root or is non-stationary. Consequently, we reject the null hypothesis which means that we are dealing with stationary time-series cross-sectional data set.

Empirical Results

Starting by estimating equation (4), which is a direct test between the alternative theoretical hypotheses, the results shown in table (3) as alternative (1), strongly support TDH and reject the REH. Given that the net saving is constant, one percent increases in government fiscal balance to *GDP* increases current account balance to *GDP* by 0.53 percent⁹. However, after augmenting the initial equation by adding variables to control for the impacts of being a small, open, developing economy incrementally as shown in equation (5), table (3) summarizes the alternative panel data regression estimates and the result of Hausman test. The Hausman test shows that there is no difference in the coefficients estimated by efficient random effects estimator and the consistent fixed effects estimator. The result of that test for equation (5) is small, 3.92 and the probability of chi2 larger than 0.05 (its 0.7894). Then we accept the null hypothesis that the two methods random effects and fixed effects yield identical coefficients, therefore we decline to use the fixed effects model. The most interesting aspect of the estimates is the existence of a positive, statistically significant, and stable relationship between government fiscal balance *GFB* and current account balance *CAB*, ($\beta_1 > 0$), irrespective of the choices of other variables in the model and the sample. A one percent increase in the government fiscal balance (surplus/deficit) to *GDP* ratio tends to (improve/deteriorate) the current account to *GDP* ratio by 0.44-0.85 percentage point.

That result is in the same line with the conventional view and resembling the findings by a lot of literature such as Vamvoukas (1997), Saleh et al (2005), Enders and Lee (1990), and Mohammadi (2004) who has found that the increase of budget surplus/*GDP* ratio by one percent improves the current account/*GDP* ratio by 0.31 to 0.49 percent in developing countries, and 0.21 to 0.24 percent in industrial countries. Also, Jeffrey and Tallman (1993) argued that the 1980's U.S budget deficit contributed significantly to the large trade deficits.

⁹ The change of current account and general fiscal balances by 0.53 percent of *GDP* is considered to be significant because the average rate of these balances to *GDP* is -2.5 to 7.5 percent of *GDP*.

Table (3) the results of estimating coefficients of equations (6) using fixed effects models:

<i>Alternatives</i>	α	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	
1	0.03 (2.99)	0.53** (0.05)	0.48** (0.03)	-0.48** (0.06)						
2	0.40 (3.06)	0.46** (0.04)	0.45** (0.03)	-0.58** (0.05)	0.18** (0.02)					
3	0.15 (3.52)	0.46** (0.04)	0.46** (0.03)	-0.58** (0.06)	0.18** (0.02)	0.29 (2.50)				
4	0.76 (3.51)	0.45** (0.05)	0.46** (0.03)	-0.60** (0.06)	0.18** (0.02)	-0.27 (2.71)	-23.17 (36.96)			
5	0.55 (3.73)	0.44** (0.05)	0.45** (0.03)	-0.57** (0.06)	0.18** (0.02)	-0.54 (2.72)	28.09 (38.80)	7.47** (2.06)		
6	-3.71 (3.26)	0.47** (0.05)	0.43** (0.03)	-0.54** (0.06)	0.18** (0.02)	-3.22 (2.64)	31.04 (39.17)	7.67** (2.07)	12.35** (3.56)	
Hausman test = 3.92			Prob>chi2 = 0.7894				Overall R-sq = 0.8135			

Values in parentheses are standard errors of estimates. ** Denote significant at 5 percent, * Denote significance at 10 percent.

Figure (2) in appendix (B) highlights that there is a stable association between two groups of variables gross domestic saving *GDS*, gross investment *GI*, and general fiscal balance *GFB* in one side and current account balance *CAB* in the other side. When gross investment exceeds gross saving, current account surplus/deficit decreases/increases respectively and also increasing/decreasing fiscal surplus/deficit do the same, which is clearly shown in equation (4). The conclusion is that, the wider the gap between saving and investment is the greater will be the deterioration in the current account balance. A one percentage point increase in the gross saving to *GDP* ratio tends to raise the current account balance to *GDP* ratio by 0.45-0.51 percent. In contrary, one percentage point increase in investment to the *GDP* ratio deteriorates current account balance by 0.48-0.60 percent, which mean that one percentage point increase in the gap between saving and investment decreases/increases current account surplus/deficit by almost 0.12 percent.

The major cause of increasing fiscal deficit in the Arab countries is the expansion of government expenditures (since the correlation coefficient between them is -0.3654) which mean that rising government expenditures deteriorates the fiscal balance. A one percent increase of government spending to *GDP* ratio statistically and significantly reduces the fiscal surplus or increases the fiscal deficit by 1.1 percent. This prediction is completely accepted for Arab countries because the reliance, in order to finance government's spending program, is not basically on taxes but on their exports of raw materials especially oil, gas and agriculture outputs which are strongly related to factors out of their hand and borrowing. The increasing government expenditure also exerts an expansionary effect on the gross domestic product *GDP* and hence household income, the demand of foreign goods increases by the amount of goods and services demanded by the household and the government ends up with a current account deterioration, that logic completely supports Barro (1974) and Blanchard (1985) point of view. The expansionary effect on *GDP* is supported by growing total factor productivity; a one percent increase in the Solow residual *SR* as a measure of growth, improves the current account position by 7.67 percent. That is, increasing *GDP*, due to the improved productivity which in turn is derived from expansionary effect of fiscal and monetary policy, increases domestic production resulting in export increase improving the current account position. Arab countries required spending programs to improve their productivity and growth; they export much more natural resources, then both economic growth and *CAB* will go in the same direction. This result is contrary to Cuñado and Gracia (2005) for Greece, Spain, Italy and Austria where the current account do not respond to productivity changes and this could be due to the differences in the stage of the development.

Also, there is a statistically significant (at 5%) positive and stable relationship between gross rates of money supply and the current account balance ($\beta_4 > 0$). An increase in the growth rate of money supply by one point improves the current account balance to *GDP* ratio by 0.18 percent. That is, in these same small open economies, fiscal deficit with fixed nominal exchange rate regime (as the Arab countries) crowds out net exports by causing the nominal exchange rate to appreciate forcing the central bank to intervene to hold the exchange rate constant. It buys the foreign money, in exchange for domestic money. This intervention causes the home country money stock to increase an interest rate starts to decline. Because these economies are small and open, when the interest rate tries to fall below world interest rate as a result of increasing money supply, savers will invest abroad. This capital outflow causes the exchange rate to fall, causes net exports to increase and trade surplus/deficit to increase/decrease. This result is in the vein

of the outcomes by Owoye (2006) in which he has found that a positive association relates the trade account balance and money supply in Nigeria.

We hypothesised that the trade openness TO would have an impact on the current account balance, but it does not. The plausible explanation is that the largest part of imports in these countries represented in industrial goods bought with very high prices and they export raw materials with very low prices. Then more openness in trade leads to more imports relative to the exports worsening current account position. Also, there is positive relationship between capital mobility and current account, that is the more freedom of transfer money from country to another the more inflow/outflow of financial assets respecting the changes in the home country monetary-fiscal policy affecting the interest rates. Using dummy variable to indicate whether the country is oil producer or not, the results confirmed that if the country is oil producer the current account balance is more likely to be affected by the monetary-fiscal policy. The oil producer country export more oil to finance its expansionary fiscal policy increases/decreases current account surplus/deficit. In other word, if the oil producer country has large fiscal deficit, it will produce and sell more oil to reduce that deficit which improve its current account balance especially when the price of oil is high.

Conclusion

In this paper we have investigated the association between current account and fiscal balances for the Arab world (small open economies). Mainly, to test the validity of REH in which lower public savings are met by equal increases in private saving, and as a result the current account does not respond to the changes in government spending, against TDH in which a fall in public saving has an adverse effect on the current account balance in some countries from the Arab world. The estimates statistically support the conventional theory of positive relationship between fiscal and external balances TDH. In our calibration, we find that one percent increase in the government fiscal balance (surplus/deficit) to GDP ratio tends to (improve/deteriorate) the current account balance to GDP ratio by 0.44 to 0.85 percent.

The wider the gap between saving and investment the greater is the deterioration in the current account balance. An increase in the growth rate of money supply by one point improves the current account balance to GDP ratio by 0.18 percent. Therefore, central banks can play very important role in order to resolve current account problems. There is no room exist for controlling of trade openness and capital mobility to affect current account balance because the relationship between trade openness and capital

mobility in one side and current account balance in the other side are not significant. But, increasing productivity improves current account balance; more spending on productivity issue will help current account status.

Appendices

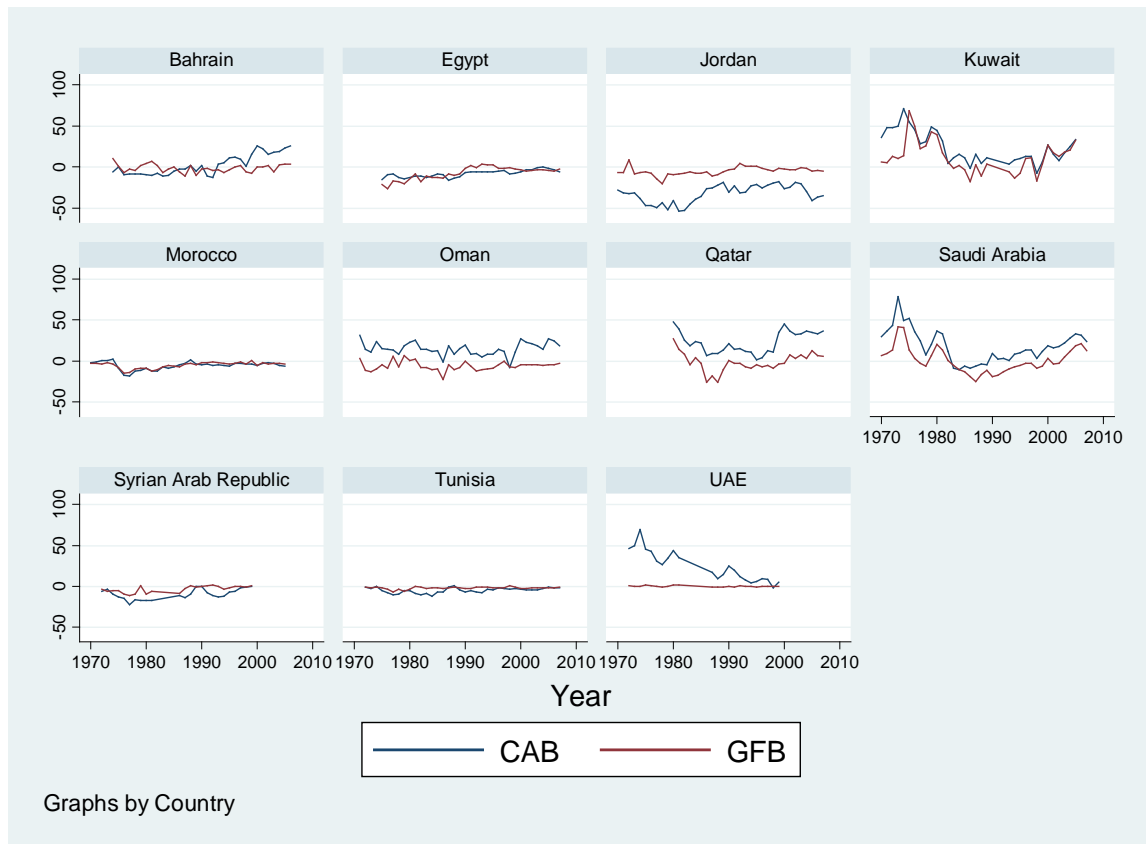
Appendix (A)

The data for all countries and variables in the sample were taken from International Financial Statistics (IFS) and Government Finance Statistics (GFS) of the International Monetary Fund (IMF), United Nations Common Database, World Bank World Development Indicators, World Bank Africa Development Indicators, and Statistical Economic and Social Research and Training Centre for Islamic Countries (SESRIC) excluding the data of fiscal deficits for Saudi Arabia and Qatar were taken from local institutions such as Qatar Planning Council and central bank of the Kingdom of Saudi Arabia.

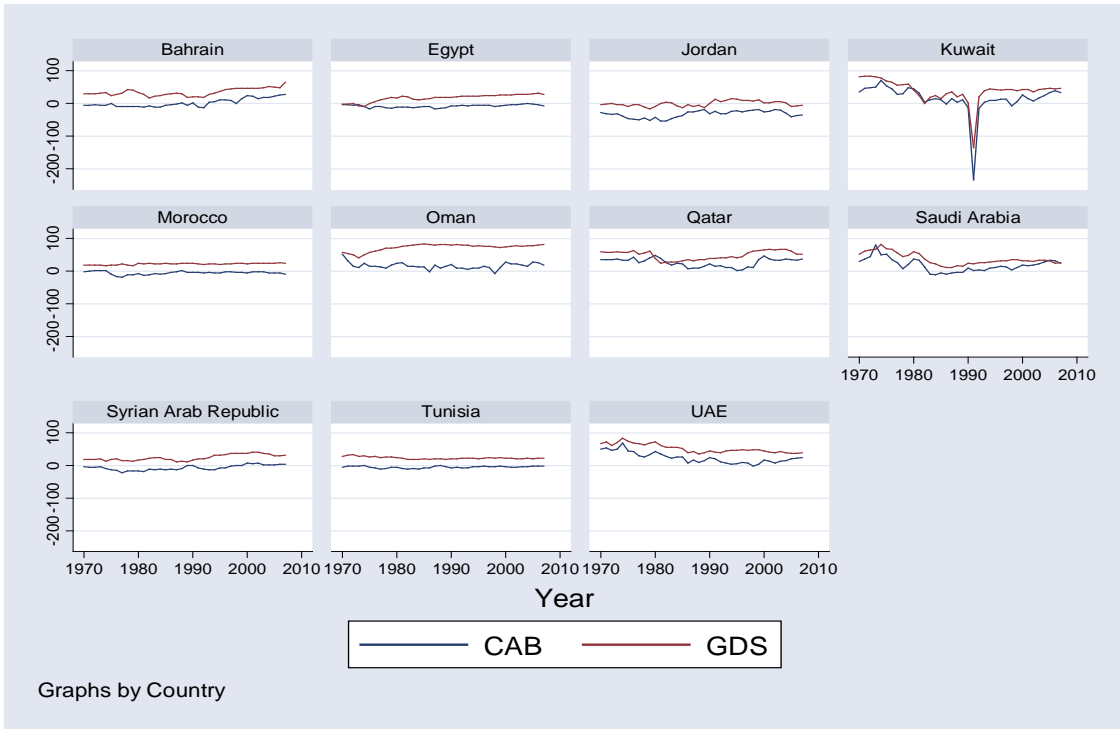
Appendix (B)

Figure (1)

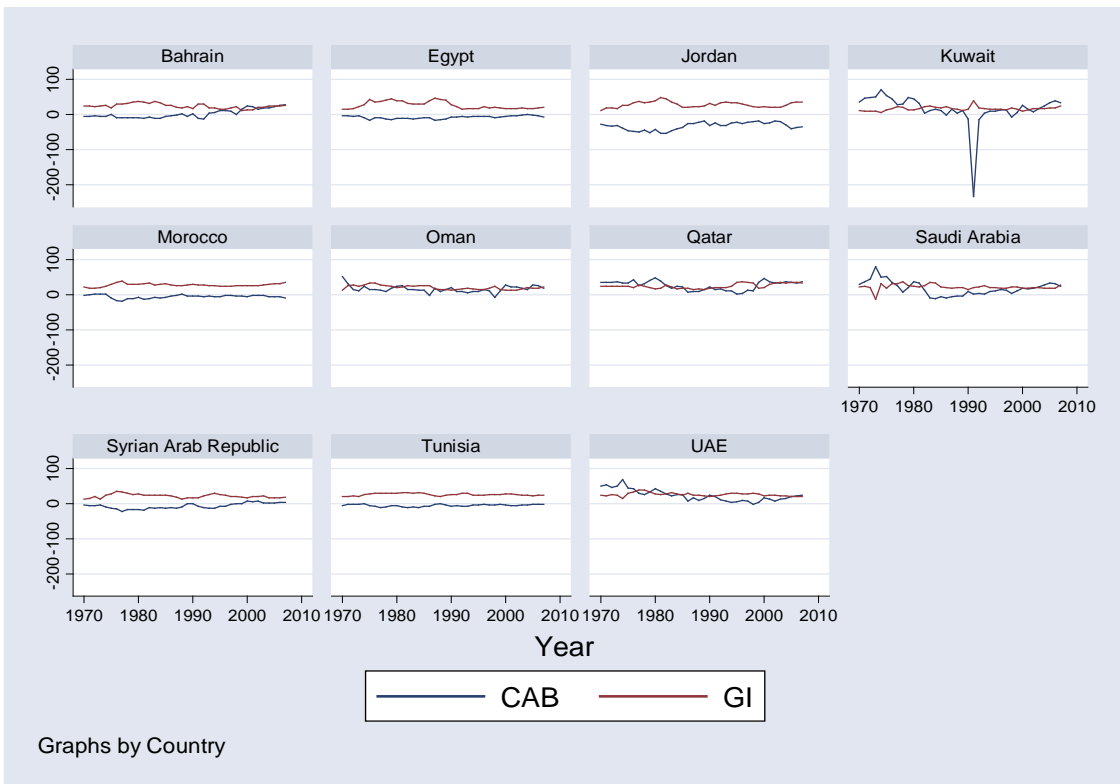
The changes of government fiscal balance (*GFB*) and current account balance (*CAB*) over time



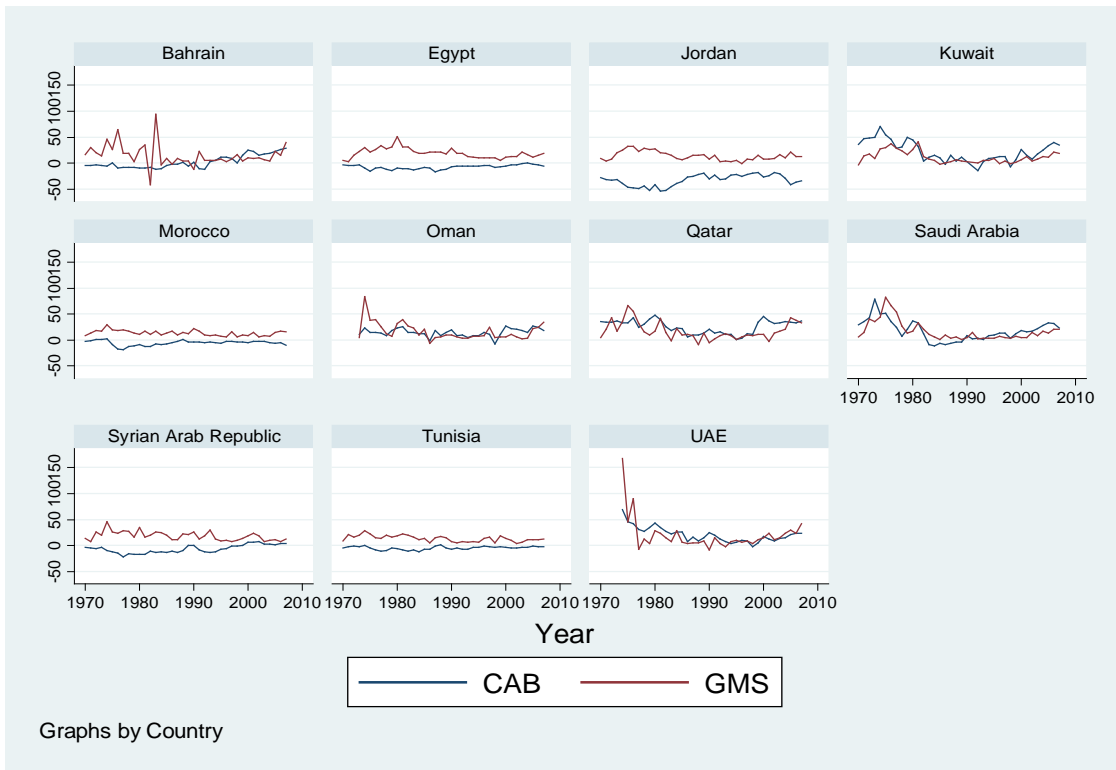
The changes of current account balance (CAB) and gross domestic saving (GDS) over time



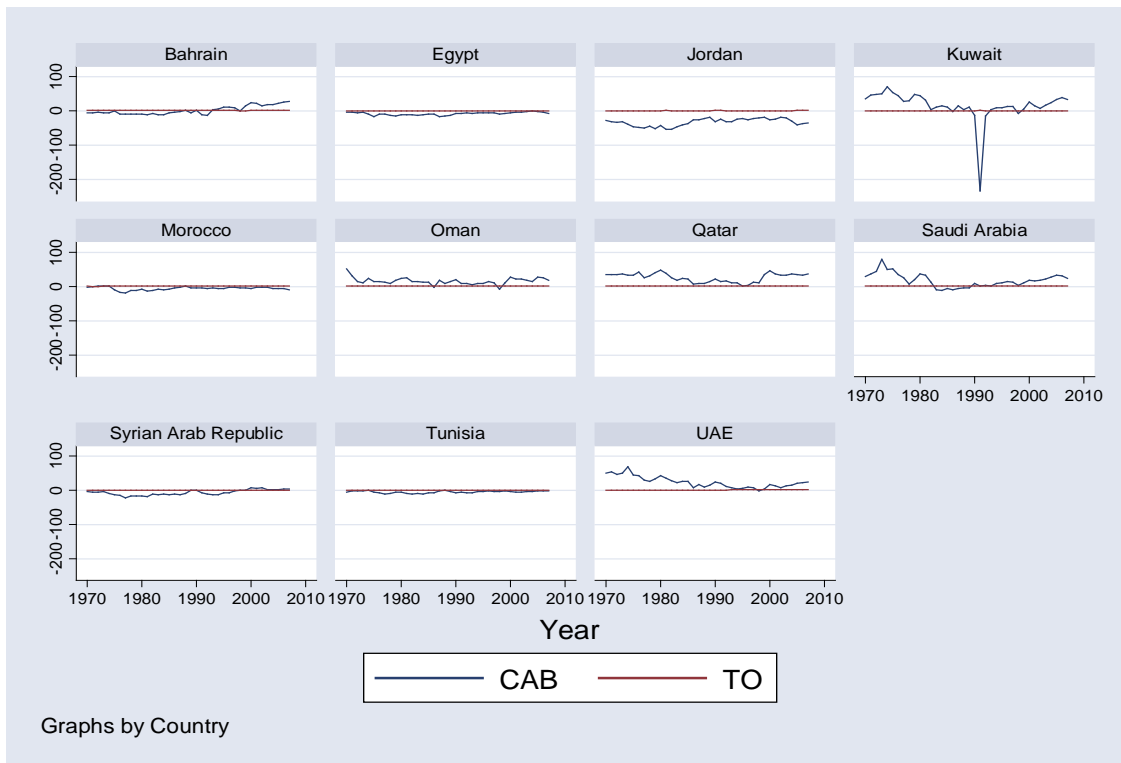
The changes of current account balance (CAB) and gross investment (GI) over time



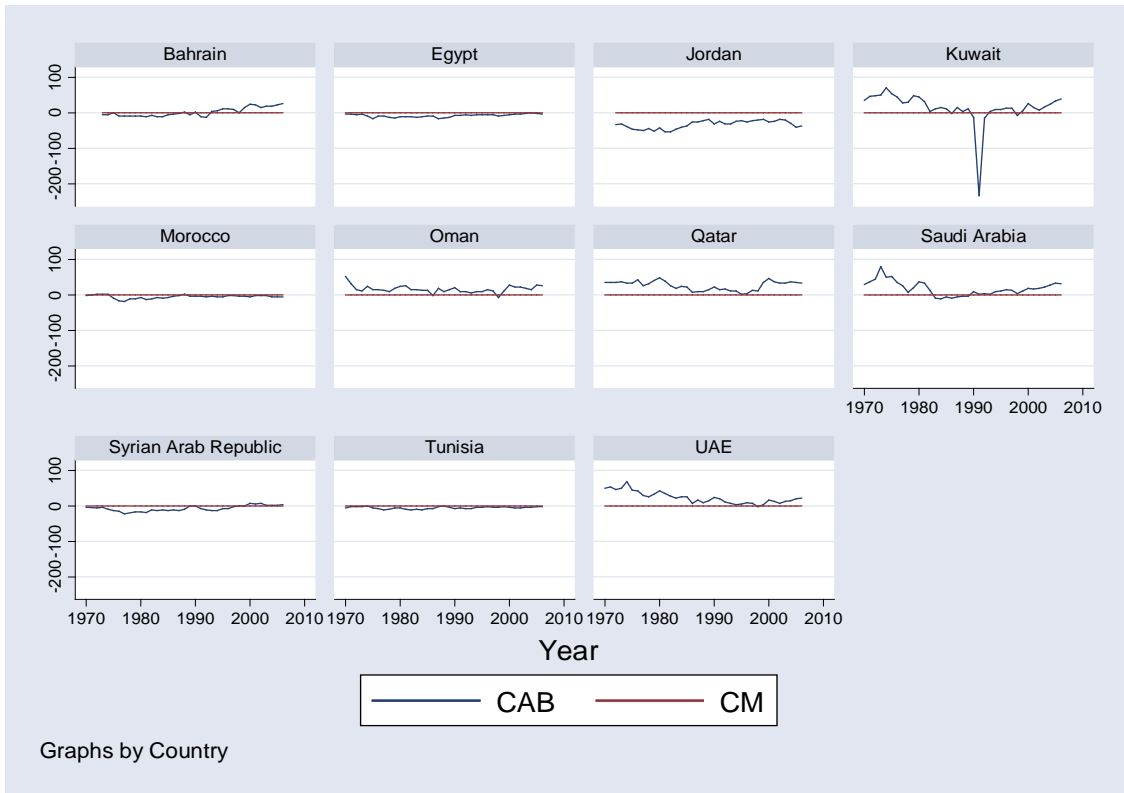
The changes of current account balance (CAB) and growth rate of money supply (GMS) over time



The changes of current account balance (CAB) and trade openness (TO) over time



The changes of current account balance (CAB) and capital mobility (CM) over time



The changes of current account balance (CAB) and Solow residual (SR) over time

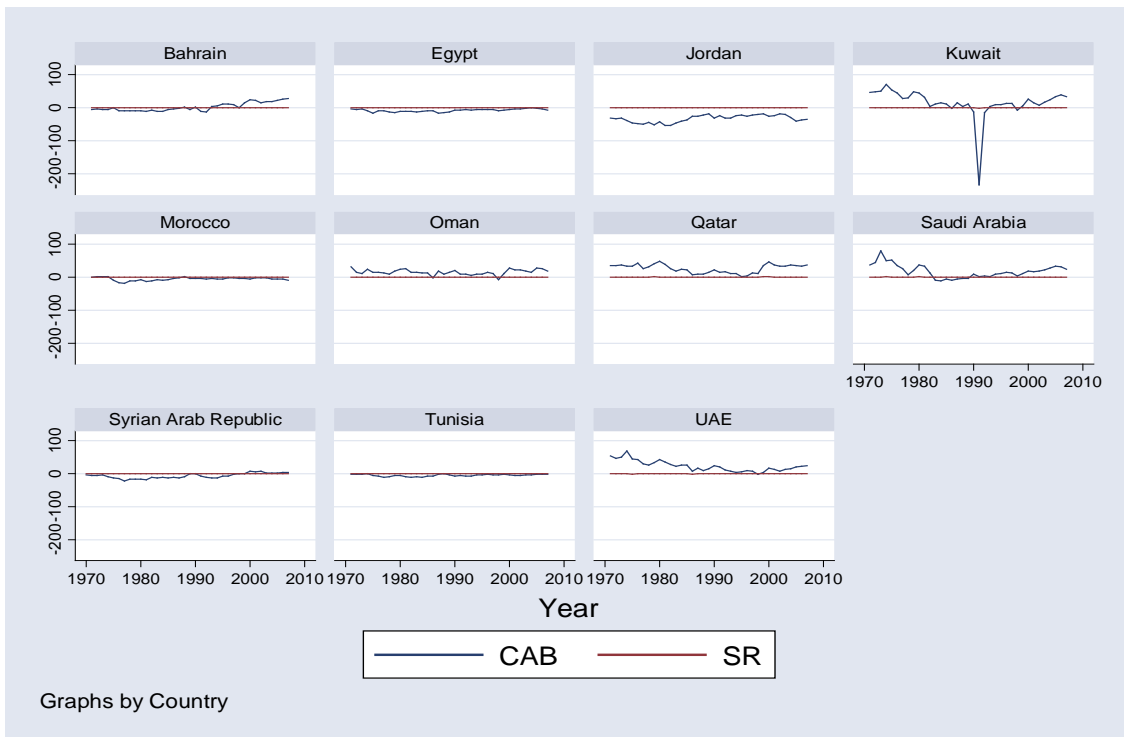
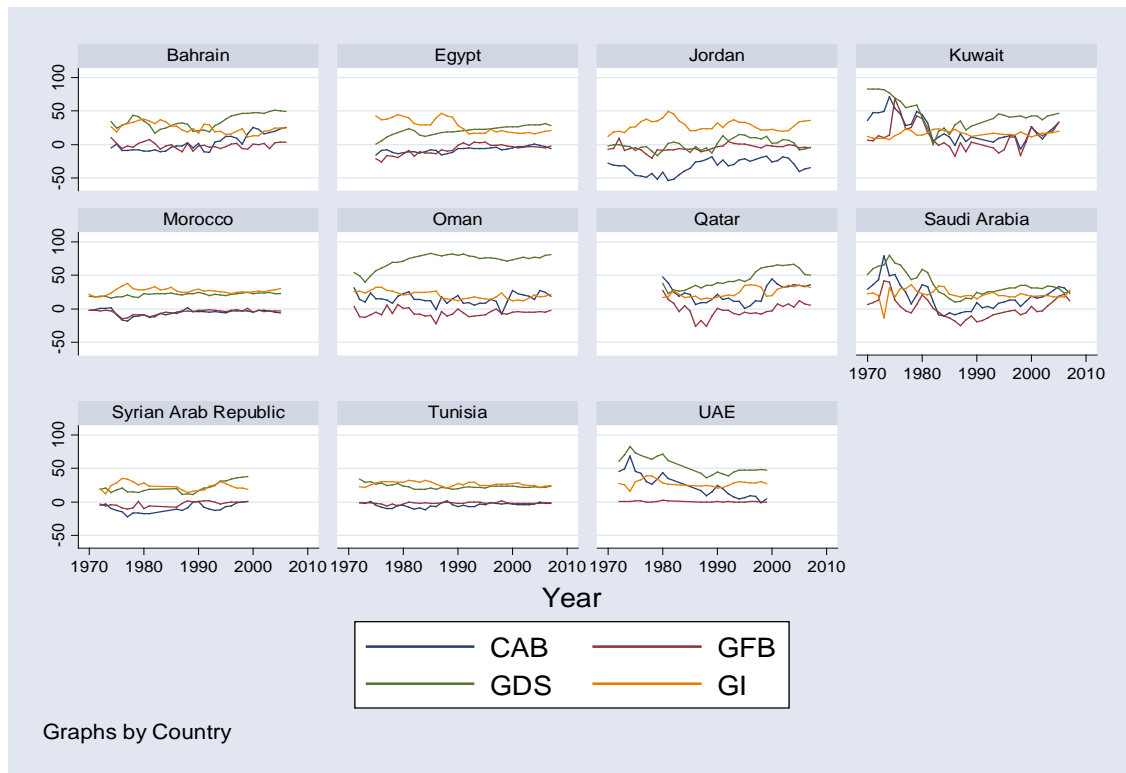


Figure (2)

The changes of (CAB), (GFB), (GDS) and (GI) over time



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