

# AFRICAN JOURNAL OF ECONOMIC POLICY

Vol. 21, No. 2, Dec. 2014  
ISSN 1116-4875

Vol. 21, No. 2, Dec. 2014

Twin Deficits Hypothesis: New Empirical Evidences from West African Countries <i>Akanni Olayinka Lawanson</i>	1
Macroeconomic Factor and Dynamics of Financial Deepening: An Empirical Investigation Applied to the CEMAC Sub-region <i>Roger Tsafack Nanfosso</i>	41
Governance and Foreign Direct Investment in Sub-Saharan Africa <i>Kazeem Ajide, Ibrahim Raheem and Oluwatosin Adeniyi</i>	73
Migrant Remittances and Production Efficiency in Agriculture: Evidence from Nigeria's Farm Household Survey <i>Odozi, Adeniyi and Yusuf</i>	91
An Economic Analysis of Fertility Behaviour in Nigeria <i>Odusanya Ibrahim Abidemi</i>	111

# TWIN DEFICITS HYPOTHESIS: NEW EMPIRICAL EVIDENCES FROM WEST AFRICAN COUNTRIES

Akanni Olayinka LAWANSON  
Department of Economics  
University of Ibadan  
Ibadan, Nigeria

## Abstract

The paper investigated the existence of Granger-causality between current account and government budget balances, with and without considering the effective real exchange rate and interest rate, over the period 1970-2008, for 14 West African (WA) countries individually and along sample groupings. The analysis is conducted within the framework of granger non-causality test and Vector Autoregression (VAR) approach on both panel data for the region and country groupings, and time series data for each individual country estimates. The results confirmed the twin-deficit relationship, with a causal relation from budget deficits to current account deficits for two countries: Ghana, and Mali; inverse relationship running from current account deficit to budget deficit for another two countries: Cote D'Ivoire and Togo. Existence of bidirectional causality and Ricardian equivalent hypothesis were confirmed for (Guinea Bissau, Mauritania, Niger, Nigeria and Senegal) and (Benin, Burkina Faso, Gambia, Guinea, and Sierra Leone), respectively. The results point to the existence of two major channels through which budget deficit affects the current account deficit. The first is the direct causal link from budget deficit to current account deficit and second, is the indirect channel that runs from budget deficit to higher interest rate to appreciation of the currency, which in turn worsens the current account deficit. There are indications that fiscal tightening (budget cuts) tends to correct the current account deficit directly as well as indirectly through interest and exchange rates.

**Keywords:** budget deficits, current account deficits, twin deficits.

## I. Introduction

The debate on the problem of twin deficits has been rekindled in the past decade by the recent global economic melt-down, and the resultant phenomena of current account and fiscal imbalances in many countries, which have attracted serious attention from academics and policy-makers in both developed and developing countries. According to OECD (2012), the global current account imbalances widened markedly in the years preceding the global economic crisis. The crisis itself brought in its wake a renewed depth of "fiscal sin"<sup>1</sup> across the developed and developing nations alike.

---

<sup>1</sup> Persistent fiscal imbalances.

Budget deficit remains one of the most discussed economic variables for any aspiring regional economic and monetary union (EMU). Budget deficit arises when total government expenditure exceeds total tax revenue in a year, which often has to be financed through borrowing by issuing government debt such as treasury bills and long-term government bonds, or external loans. Setting limit for budget deficit for countries in any regional integration is one of the core criteria for joining or operating in common currency economies. As witnessed in the case of European Union, countries where absorption into the EMU stage is conditional on being able to meet the "fiscal criterion" in terms of both a "budget deficit criterion" and a "debt criterion". That is, the ratio of the annual general government deficit relative to gross domestic product (GDP) and the ratio of gross government debt relative to GDP at market prices must not exceed 3% and 60%, respectively at the end of the preceding or two subsequent fiscal year(s). Series of development in the economy is usually triggered by budget deficit, in which government outlay is not met with available revenue, as government expenditure constitutes a significant component of aggregate demand.

Current account balance, which is the difference between the total receipts from export of goods and services and grants of transfer payment abroad, is indicative of whether a country has a deficit or surplus. It is simply the sum of three account transactions relating to trade in goods and services and unilateral transfers: net export goods and services, net income, and net current transfers. Surplus or deficit in the current account depends on whether absorption is less than or exceeds income, respectively.

Thus the concern has been centered on the extent to which fiscal adjustment can contribute to resolving external imbalances, especially when it is persistent and/or large. Most importantly is its implication on entering into the third stage of EMU by various regional economic integration blocks. The fiscal and current account positions of any country are central to its long-term economic progress. The budget balance is believed to affect current account balance, in that it impacts the net export of goods and services, affects domestic industries, which trickle down on employment rate condition and income. As has been demonstrated in the experience of a number of mostly developed countries, the occurrence of macroeconomic imbalances can be attributed to increasing fiscal and current account imbalances. For instance the Southern European countries accumulated large current account deficits because poor price competitiveness, which impeded them to export abroad. Deficit countries saw their prices growing more rapidly than surplus countries, with Greek, Spanish and Portuguese prices growing respectively by 18%, 17% and 14% above those in the rest of the Eurozone, between 1994 and 2007. Current account imbalances have been having slightly different causes in individual countries. Greece's large current account deficit is mainly the result of a lax fiscal policy (Marzinotto, 2012).

From the decades of 1970s most WA countries have consistently ran budget deficit to finance large and growing government expenditure. Government resulted to direct (from international financial institutions) and indirect (through issuing of bonds to foreign investors) external borrowings to finance the deficits. The persistent budget deficits eventually gave way to current account deficits and accumulation of large stock of external debt. The economies of WA countries are characterized by large current account deficits accompanied by foreign debt, which has kept them at the state of underdevelopment. The current account position has historically been mainly one of deficits. Since, mid-80s, the size of this public external debt has become so large that on the average it exceeded 100% of the gross national income (GNI), and build up to over 184% of GNI by 2003. Subsequently, repayment of interest and/or principal on their external liabilities became difficult, and by 2004 the total external debt stock of all the region has reached over US\$74 billion, resulting in severe debt crisis.

While most of the countries of the region significantly benefited from the debt relief initiatives, the fiscal sins and trade imbalances continue unabated. With the exemption of Nigeria, all other West Africa countries experienced in the last four decades an average current account deficit of between 5.2 percent of GDP in Cote d'Ivoire and 27.6 percent of GDP in Guinea Bissau. All the member countries also experienced an average government budget deficit as percentage of GDP of between 1.1 in Mauritius to 14.8 in Guinea Bissau over the same period (see Figure 1).

West African countries under the auspices of ECOWAS regional economic integration, has over the years struggled to enter the third stage of EMU. Apart from working towards convergence in interest rate and inflation for the region, the determination of common fiscal rule remains a strong challenge to the union, as most countries continue to exceed the prescribed ratio of budget deficit excluding grants to GDP of less than 4%. Unabated substantial current account deficits of individual ECOWAS countries imply a possible external position problem of the region's economy to the rest of the world, which may threaten its EMU ambition. While restricted budget deficit is required for members of any EMU, an unfavourable current account position of member countries may be restrictive to its takeoff. Given the implications of both budget deficit and current account deficit positions on the performance of the economy, and the implications for entering the EMU stage, this paper empirically investigates the granger causality between these two phenomena among ECOWAS members. This will in addition to informing policy perspective to address the phenomena, provide evidence based insight to enhance the move towards EMU by ECOWAS members.

The remaining sections of this paper are structured as follows. Brief macroeconomic background of West African Countries is presented in section 2, while section 3 provides a review of the relevant literature, and the description of the theoretical framework of national accounting identity for analyzing the causal relationship of the twin deficits is provided section 4. The test for the twin deficits hypothesis and empirical results are presented in Section 5. Section 6 provides the concluding remarks and the discussion of the policy implications.

## II. Brief Macroeconomic Background of West African Countries

West Africa sub region is made up of 16 countries<sup>2</sup>, of which 15 are members of the ECOWAS: a regional organisation formed in 1975, with the exception of Mauritania, who opted out in 2002, though grouped along with ECOWAS for the European Union (EU) Economic Partnership Agreement (EPA) negotiations. The average capita GDP (PPP) of US\$1,361 in for the region compares poorly with other African region economic blocks<sup>3</sup> like SACU (US\$ 10,605); UMA (US\$ 5,836); Agadir (US\$ 4,075); SADC (US\$ 3,152); CEMAC (US\$ 2,435); and COMESA (US\$1,811) (CIA World Fact book, 2005; IMF WEO Database). The economic and political ties of these countries appear to follow their colonial history. Nine of the countries in WA are Francophone<sup>4</sup>, while the rest are countries made up of Anglophone, and other non-French speaking countries. The national currency in most of the Francophone countries is the West African CFA franc, managed by the West African Economic and Monetary Union (UEMOA).

---

<sup>2</sup> They are: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

<sup>3</sup> SACU: Southern African Customs Union; UMA: Arab Maghreb Union; Agadir: the Greater Arab Free Trade Area; SADC: Southern African Development Community; CEMAC: Central African Economic and Monetary Community; COMESA: Common Market for Eastern and Southern Africa.

<sup>4</sup> Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Mauritania, Niger, Senegal, and Togo.

Presented in Table1 are some macroeconomic performances indicators for the region along the Francophone and Non-Francophone countries divide. The growth rate of the real gross domestic product (RGDP) per capita in the two set of countries have not only been minimal, but fluctuated significantly over the last four decades. The marginal positive growth witnessed in the decade of the 1970s, was followed by an average decline in the decade of 1980 for both sets of countries, and further for non-Francophone countries in 1990s. The recovery of the first decade of the twenty first century was marginal for the Francophone countries at less than 1 percent, while the relative appreciable average growth of 3.5 percent was experienced by the non-Francophone countries. Coupled with this is the progressive inflationary rate that has worsened over the decades throughout the region.

The public sector the regions countries has on the average been characterised by budget deficit, exceeding 5 percent of the GDP for most of the last four decades. Also the current account balance of the countries has remained at deficits for the past four decades, ranging between 7.7 and 11% in the Francophone countries, and between 4.25 and 9.4 percent in the non-francophone countries. Though proportion of the current account deficits to GDP has declined over the decades, the magnitude has continued to increase. However, more worrisome is the effect of the recent global financial crisis on the current account balances of the region, which has taken dramatic turns, amounting to an average of over 22% of GDP. This is not unconnected with the substantial share of government expenditure in real GDP, which has remained at almost one-quarter in the Francophone countries and progressively moved from 10.65 percent in 1970s to 13.6% in 2000s in the non-Francophone countries. These public and external sectors of the countries have put the region in a vulnerable state. Though the external reserves in months of imports of the countries on the average have increased from barely two months in the 1970s to a little above four months in 2000s, the ratio of reserves to total external debt remains insignificant. Since a country's external account must always balance, the persistent current account deficits and the budget deficits have resulted in accumulation of external debts by the WA countries. While the stock of external debt in the region mostly on the average exceeded her Gross National Income (GNI), the debt was more than the region's yearly exports by between 0.34 and 5.2 folds in Francophone countries and between 1.83 and 3.2 fold in non-Francophone countries over the last four decades. Thus the burden of servicing of these debts has remained substantial in terms of proportion of GNI and share of exports. The capital formation in these economies has been generally low at less than 20% of GDP over the last four decades. Investment as percentage of real GDP is significantly higher in the Francophone countries, ranging between 10% and 15.3%, though exhibited declining trend, while it ranged between 6.9 percent and 9.4 percent in the non-Francophone countries. However, the flow of foreign direct investment (FDI) remained low, though it has progressively increased over the decades, apart from the decade of 1980s. The FDI as percentage of GDP, ranged higher in non-Francophone countries between 0.3 and 5 percent, while it ranged between 0.5 and 3.6 percent in Francophone countries.

**Table1: Stylized Facts on Some Macroeconomic Indicators for West African Countries**

Macroeconomic Indicators		1971-80	1981-90	1991-00	2001-08	Sources (Computed from)
GDP per capita Growth Rate (%)	Francophone	0.3	-0.75	0.35	0.8	GDF
	Non-Francophone	1.2	-0.65	-0.45	3.5	

CPI	Francophone	2.3	1.05	3.95	3.4	GDF
	Non-Francophone	0.17	1.35	3.35	9.5	
Budget Deficit (% of GD)	Francophone	6.62	4.90	4.09	2.91	WDI
	Non-Francophone	6.27	5.63	4.45	5.42	
Govt. Share of RGDP (%)	Francophone	24	23.8	22.45	22.8	PWT 7.1
	Non-Francophone	10.65	11.45	11.25	13.6	
Current Account Balance (% of GDP)	Francophone	-10.99	-11.90	-7.71	-7.73	WDI
	Non-Francophone	-9.42	-5.63	-4.25	-4.48	
Openness (% of GDP)	Francophone	59.6	65.5	57.6	70.0	GDF
	Non-Francophone	51.85	56.6	72.15	77.1	
Reserves in months of imports	Francophone	1.75	1.85	2.75	4.3	GDF
	Non-Francophone	2	2.3	2.8	4.2	
Reserves (% of total external debt)	Francophone	33.35	9.5	8.5	15.7	GDF
	Non-Francophone	76.55	8.6	11.2	68.5	
External debt stocks (% of GNI)	Francophone	35.45	112.2	144.45	96.8	GDF
	Non-Francophone	23.75	84.65	107.6	99.2	
TDS/ GNI (%)	Francophone	2.7	7.4	5.25	3.4	GDF
	Non-Francophone	1.85	6.3	5.65	3.9	
EDT/EXPT (%)	Francophone	133.55	502.3	615.9	345.8	GDF
	Non-Francophone	96.6	283.75	420.45	326.4	
TDS/EXPT (%)	Francophone	12.6	23.05	16.8	15.2	GDF
	Non-Francophone	9.7	19.75	19.6	17.5	
Gross Capital Formation (% of GDP)	Francophone	19.85	19.25	16.6	20.2	GDF
	Non-Francophone	11.8	13.75	17.1	20.6	
Investment/Real GDP (%)	Francophone	15.3	12.6	10.2	11.0	PWT 7.1
	Non-Francophone	9.35	6.9	7.5	6.9	
FDI Net Inflow ( % of GDP)	Francophone	0.75	0.5	1.2	3.6	GDF
	Non-Francophone	1.15	0.3	2.4	5.0	

Note: GDF: Global Development Finance; WDI: World Development Indicators; and PWT: Penn World Tables

### III. Literature Review

The “twin deficits hypothesis” is an economic concept that asserts that there is a strong association between government budget (fiscal) balance and the current account balance of a nation’s economy. “Twin deficits” is defined as a long run (positive) relationship between current account and budget balances, including some other factors as interest rates and exchange rates (McCoskey and Kao, 1999). It is sometimes referred to as “double deficit hypothesis” or “twin deficits anomaly”. Both theoretical and empirical literature offer different explanation to the twin deficits issues. A positive correlation between the budget balance and the current account balance is not necessarily provided by empirical analysis (Afonso, and Rault, 2009), as there are some mixed evidences in favour of a twin-deficit relationship.

The theoretical basis and empirical conclusions on twin deficits in the literature are generally diverse. From a theoretical perspective, fiscal expansion could worsen both current account balances and the appreciation of real exchange rate (Salvatore, 2006). Theoretically, four alternative causal hypotheses on the association between budget deficit and current account deficit can be identified in the literature. Existence of positive relationship between budget deficit and current account deficit, as propounded by Keynes, hypothesized that budget deficit results in trade deficit. The Ricardian equivalent hypothesis (REH), conversely assert existence of no link between the twin deficits. Similarly, inverse relationship, in which it is current account deficit that results in budget deficit, as well as existence of bidirectional link between the twin deficits have also been established in the literature. The first which forms the basis of



the twin deficits hypothesis is the conventional Keynesian proposition that budget deficits cause current account deficits. The second is the reverse causality that runs from the current account deficits to budget deficits. Third is the Ricardian Equivalent hypothesis that the two deficits are not causally related. Fourth theoretical hypothesis that has been proposed in the literature and investigated by previous studies is the existence of a bi-directional causality between budget deficits and current account deficits in which the deficits are considered to be endogenous.

### ***Keynesian Twin Deficits Hypothesis***

The twin deficit hypothesis propounded by Keynes, suggests that a larger fiscal deficit, through its effect on national saving and consumption, leads to an expanded current account deficit (Bartolini and Lahiri, 2006). The “twin deficits hypothesis” asserts that in order for the current account deficit to fall, the fiscal deficit must also fall – reduction in the government budget deficit is a necessary condition for balance of payment improvement (Bruton, 1989). The hypothesis rests on the assumption that the relationship between fiscal deficits and private consumption is a positive one, i.e. an increase in the deficit leads to higher private consumption, as suggested by the Keynesian model (Nickel and Vansteenkiste, 2008). Increase in government budget deficit either through increasing spending or reducing taxes causes an increase in aggregate demand, and would heighten flow of imports. Accounting for the channels through which the two variables impact each other,

The twin deficits hypothesis affirms that intensification of budget deficit will cause a similar rise in current account deficit. The Keynesian absorption theory argues that an increase in the budget deficit would induce domestic absorption and therefore import expansion, causing a current account deficit (Siddiqui, 2010). The Keynesian proposition, which support existence of unidirectional Granger causality that runs from budget deficit to current account deficit, views increase in budget deficit as working through a series of channels to worsen current account balance. If world capital markets are integrated and Ricardian equivalence does not hold, an increase in the budget deficit will almost certainly contribute to the current account deficit (Bernheim, 1988). Though the transition mechanisms may differ, under either flexible or fixed exchange rate, current account deficit is ultimately worsened by running budget deficit. Using the popular Mundell-Fleming framework, upward pressure on interest rate constitute the first impact of increase in budget deficit, which subsequently leads to capital inflows and appreciation of the exchange rates. Under a flexible exchange rate regime, the current account is worsened due to the increased attractiveness of imports, and less attractiveness of exports caused by the appreciated exchange rate. However, in a fixed exchange regime, the worsening current account impact of budget deficit stimulus is transmitted through either higher real income or higher prices. The higher the economy’s openness the more relevant will be the effect. Budget deficits can have a decreasing effect on national savings, as it generates higher interest rates, which crowds out private investment, leading to decrease in long-run capital stock and potential output. Private saving tends to decline when fiscal policy loosens.

According to Bartolini and Lahiri (2006), a tax cut or other fiscal expansion financed by the issuance of public debt lowers national saving by increasing private disposable income and hence private consumption. However, the implications for investment and the current account depend on a country’s degree of openness to capital transactions with the rest of the world.

While the effect on interest rate and the crowding out effect would be weaker in an open economy, the national product may however be depressed by the resulting current account deficits and higher claims by foreigners. It has been argued that as long as the budget and current account are within the “credibility range” (Gramlich (2004), neither type of deficit will be having large effects upon interest rates and exchange rates and as a result, will not have severe economic consequences (Pires, 2010).

### ***Current Account Targeting Hypothesis***

The second proposition supports a reverse relationship of Keynesian hypothesis, in which a unidirectional causality runs from current account deficit to budget deficit. Summer (1988) termed the reverse causality “current account targeting”, in which the policy instrument to achieve fiscal discipline lies in targeting a prescribed current account balance, i.e. external adjustment may be pursued through budget (fiscal) policy. This will occur if the government of a country utilized its budget (fiscal) stance to target the current account balance (Alkswani, 2000). Deterioration in current account is viewed as having implications on the economic performance and hence the budget deficit. Government may be compelled to expand spending due to increased pressure arising from a decline in the net export occasioned by other factors aside budget deficits. Deleterious economic and financial consequences of the current account deficits may prompt the government to increase spending to stimulate the economy, while at the same time faced with declining tax revenue. The existence of current account deficits driving budget deficits implies that single equation specification is biased and inconsistent. Thus, simultaneous equation specifications that allows for the test of the direction of causality become more apt.

### ***Ricardian Equivalent Hypothesis***

The Ricardian Equivalent Hypothesis, which refutes existence of any Granger causality between budget deficit and current account deficits, was discovered from the seminal work of Barro (1974) by Buchanan (1976). The Ricardian 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 (Nickel and Vansteenkiste, 2008). The hypothesis proposes that shifts between taxes and budget deficits do not impact the real interest rate, the quantity of investment, or the current account balance, does deny any relationship between the two deficits (Pahlavani and Saleh, 2009). 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, 1974). It ascertains that an inter-temporal shift between taxes and budget deficit does not matter for real interest rates, the quantity of investment or the current account balance. This hypothesis assumes that change in savings will fully offset change in the budget deficit, since current decrease in taxes will be compensated for by increase in future taxes, living the household lifetime wealth unaffected. The household saves (increase in current private savings) towards future tax increase from the income received from current tax cut, thus twin deficits will not arise from a budget deficit. The Ricardian Equivalence ensures that current account does not belong in the long run relationship. Focusing on measures to reduce budget deficit when it is not the cause of the observed current deficits, will hence live the problem unresolved while diverting attention from more relevant and urgently needed policy options that address productivity, competitiveness in foreign market, and export promotion programmes (see Mukhtar, et al., 2007).



### ***Twin Deficit Bidirectional Hypothesis***

The fourth is the bi-directional hypothesis in which both budget deficit and current account deficit simultaneously affect each other. That is budget deficit Granger causes current account deficit, and vice versa. In this case both deficits become endogenous to the system. The use of single equation will tend to be biased, requiring that a simultaneous specification model be appropriate. This often leads to vicious cycle once it begins, implying the need for extraordinary policy intervention.

### **Empirical Review**

Based on these theoretical propositions, empirical investigations by many studies have been tailored to ascertain the applicable proposition in different country-situations. The literature is characterized by conflicting empirical works in support and against twin deficits hypothesis. While the hypothesis asserts that an increase in budget deficit will cause a similar increase in current account, empirical studies turned out differently for different countries, different econometric techniques and different model specifications. While some empirical studies conclude that higher fiscal deficits generate higher current account deficits, others attest to the opposite or indicate no significant link at all, or show existence of causality in both direction. The variation in results that characterize the literature may not be unconnected with the differences in sample periods, specifications and countries focused on by previous studies. Studies' conclusions are often influenced by the specification format adopted.

### ***Econometric Approaches and Channels of Impact***

A variety of econometric approaches to investigating twin deficits hypothesis have been adopted by different studies in the literature. It varies from simple narrative approach to econometric analysis that uses cointegration techniques, single and panel regression techniques to analyze long-term relationship between the deficits, as well as causality test with vector autoregressive techniques. Most single regression analysis studies focused on US, and have been characterized by varying results (Kim and Roubini, 2008).

Morgan (1979) developed a framework based on the concepts of domestic budget balance and foreign budget balance to demonstrate the interrelationships among budgetary development and domestic liquidity, aggregate demand, and the balance of payments. The framework suggests a possible propagation of inflation and balance of payments problem working through increase aggregate demand enhanced by the monetization of foreign exchange earnings when budget deficit is financed by foreign budget balance. Zaidi (1985) examined the relationship between fiscal deficit and the current account balance, using cross-sectional time-series data drawn from 12 developing countries. Mansur (1989) adopted a structural model explaining on one hand the inter-relationships between fiscal expansion and the current account balance, and on the other hand, government fiscal operations, domestic credit and money supply. Bartoli (1989) also developed a set of structural equations to evaluate the impact of this phenomenon on the current account balance. Particularly revealing from this research is the finding that inflation tax and the method of financing budget deficit worsen the current account balance through its negative impact on domestic savings, capital expenditure, which tended to crowd-in private investment as it raised domestic absorption, which aggravates the current account deficit.

Where the twin deficits hypothesis exists, three main channels have been identified in the literature, through which fiscal policy affects current account (see Abbas et al., 2010). There are direct impact through demand, impact through the real exchange rate, and through impact on interest rates and country risk premia. The direct demand channel works through government consumption and investment demand for tradable goods. The more of the budget deficit expended on imported goods the more it translates into movement in the trade balance. As long as the economic agents are not Ricardian, fiscal expansion implemented either through tax reduction or spending increase will tend to increase demand (including imports) and the trade deficit (Abbas et al., 2010). As government spends more on non-tradable, alteration of the relative price of non-tradable, that is the real exchange rate, can ensue from fiscal deficit to affect the current account balance. Thus the real appreciation can lead to divergence between domestic consumption and production with respect to non-tradable goods. While lower proportion of non-tradable are demanded for consumption, higher proportion of non-tradable are produced. Also fiscal deficit can increase interest rate, especially in the face of investment crowding out through government borrowing. When the budget deficit increases, the resulting higher interest rates induce an appreciation of the exchange rate, which makes domestic goods relatively more expensive than imported goods, which depresses sales of domestic goods and stimulates sales of imported goods, thereby leading to deterioration in the trade balance (Cavallo, 2005).

### ***Empirical Findings Review***

While many studies<sup>5</sup> found evidences in support of the Keynesian conventional view that twin deficits are closely linked and causality runs from budget deficit to current account deficit, the reverse causality, running from current account deficit to budget deficit have been confirmed by some other studies. Using growth and lagged growth basis for regression of the current account as percentage of GDP on the budget deficit as percentage of GDP and controlling for business cycle effects, Bernheim (1988) obtained a coefficient of 0.3 percentage points of GDP on the budget deficit for US. In a sample study of the G7 Piersanti (2000) found evidence in support of twin deficits, with an implied long-run coefficient on the budget deficit of 0.15. Using an inter-temporal model with distortionary taxation, Roubini (1988) demonstrated that tax smoothing implies a one-to-one relationship between the current account and the fiscal deficit. The author concluded that varying from country to country the increase in government budget deficit is associated with an increase of the current account deficit of 0.14-0.16 percent of GDP. Estimates from Bartolini and Lahiri (2006) revealed that each dollar rise in the fiscal deficit is associated with average with a 30cent decline in the current account. Based on estimated fall in national saving of between 33 and 37 cent due to a dollar rise in the fiscal deficit, they concluded that changes in national saving are reflected almost one-for-one in changes in current account. Depending on model specification, Miller and Russek (1989) found causality direction from fiscal deficit to trade deficit, with increase in budget deficit being associated with an increase of the current account deficit varying from 0.20 to 0.45 percent of GDP. Erceg, et al. (2005) found trade balance deterioration of about 0.12% of GDP to result from a persistent cut in labour tax rates that produces a decline in tax receipts equivalent to 1% of GDP, while a trade balance decline of about 0.15% of GDP is induced by a deficit-financed

---

<sup>5</sup> Pahlavani and Saleh (2009), Afonso and Rault (2009), Beetsma et al.(2007), Corsetti and Muller (2006), Cavallo (2005), Erceg et al. (2005), Kim and Roubini (2003), Aqeel and Nishat (2000), Leachman and Francis (2002), Piersantim (2000), Vamvoukas (1999), Kasa (1994), Bacham (1992), Zietiz and Pemberton (1990), Islam (1998), Abell (1990), and Mansur (1989).

increase in government expenditure corresponding to 1% of GDP. They also found evidence in support of twin deficits hypothesis, but with a two to three-year lag effect of less than 0.2 percentage point.

Beetsma et al. (2007) found that budget deficit increase of 1% of GDP worsens the trade balance by between 0.5 and 0.8 percentage points of GDP upon impact and by two years later, respectively. However, Monacelli and Perotti (2007) found a three-year delay impact of a 1 percentage point of GDP increase in real government consumption on trade balance of 0.5 percentage points GDP. Empirical results on Philippines by Pahlavani and Saleh (2009) also give further support to the Keynesian view that there is a strong link between budget deficits and current account deficits. The impact of budget deficit on the current account balance appears to have lesser and of shorter-effect in economies where trade is a small share of GDP, than economies where trade is a higher share of GDP (see Corsetti and Muller, 2006).

Studies like Kearney and Monadjemi (1990) on OECD countries, the four-country study of Philippines, India, Indonesia and Korea by Anoruo and Ramchander (1998), and the study on Indonesia and Pakistan by Khalid and Teo (1999) support the twin deficits reverse causation. Similar finding was reported in the Saudi Arabia case study by Alkswani (2000). Afonso and Rault (2009) found twin deficits hypothesis and the reverse causation for different groups of OECD countries. While evidence in support of the hypothesis was found for some EU countries like (Bulgaria, Czech Republic, Estonia, Finland, France, Italy, Hungary, Lithuania, Poland, and Slovakia), along the lines of the so-called twin-deficit relationship, a reverse causality was found to be statistically significant for a somewhat different sub-set of OECD countries.

Relating to the Ricardian equivalent hypothesis, evidence of absence of Granger causality link between the two deficits has been confirmed by some other studies<sup>6</sup>. Kaufmann et al (2002) concluded that in the Australian case, current account deficit is driven by inter-temporal expenditure allocation. The Evans and Hassan (1994) investigation of the Ricardian Equivalent hypothesis found evidence in support of absence of link between the two deficits.

Evidence in support of bi-directional causality between the two deficits has also been found by a number of studies<sup>7</sup>. Pahlavani and Saleh (2009) found a bidirectional relationship between budget deficits and current account deficits, and concluded that policy measures to reduce the budget deficit could play an important role in reducing the current account imbalances and vice-versa. With respect to result in support of bidirectional causality Mukhtar et al. (2007) cautioned that analysis of twin hypothesis issue should be performed within a simultaneous-equation model rather than single-equation.

Where twin deficits hypothesis holds, the concern in past studies have also focused on whether the impact of budget deficit on current account deficit is direct or indirect. While majority of the studies that found evidence of association running from budget deficit to current account deficit adopted direct specification, studies such as Abell (1990) have demonstrated that the link between budget deficit and current account deficit is indirect rather than direct. The transmission of budget deficit effect was shown to work through higher interest rate, attracting inflow of foreign capital, resulting in an appreciation of the exchange rate, and subsequently stimulate current account deficit.

---

<sup>6</sup> Kaufmann et al (2002), Papaioannou (2001), Barlett (1999), Kim (1995), Evans and Hassan (1994), Evans (1993), Winner (1993), Boucher (1991), Dewold and Ulan (1990), Enders and Less (1990), Miller and Russek (1989), and Laney (1984).

<sup>7</sup> Pahlavani and Saleh, 2009; Mukhtar, et al., 2007; Normandin, 1999; Kearney and Monadjemi, 1990; Darrat, 1988).

In summary, both theoretical and empirical evidences in support of the so call twin deficits hypothesis, running from budget deficit to current account deficit; it inverse direction relationship, running from current account deficit to budget deficit; bi-directional relationship between the two deficits, as well existence of no link, in line with the Ricardian Equivalent hypothesis are well established in the literature.

**IV. Methodology**

**4.1 Theoretical Framework**

The basis for the link between budget deficit and current account deficit is embedded in the national account identity. Following the proposed Keynesian open economy model:

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

where Y is gross domestic product, C is consumption, I is investment, G is government expenditure, and X-M is net exports, which is also defined as current account (CA) balance. The sum of the first three terms on the left hand side constitutes the spending of domestic residents (domestic absorption). Rearranging equation 1:

$$CA = Y - (C + I + G) \dots \dots \dots (2)$$

In a closed economy, aggregate domestic savings (S) is equal to aggregate investment (I). However, an open economy funds available for investment goes beyond domestic savings as funds can be tapped from both domestic and international sources for investment to boost national income. Thus:

$$S - I = CA \dots \dots \dots (3)$$

Current account deficit arises when aggregate savings is less than aggregate investment meaning the country is borrowing resources from the rest of the world, while surplus of the same is achieved when aggregate savings is greater than aggregate investment, which enables the country to lend abroad. The relationship in equation 3 implies that current account is negatively affected by investment support policies, while positive impact is engendered by consumption (private or public) reduction policies. Decomposing aggregate savings into private (S<sub>p</sub>) and government (S<sub>g</sub>): CA = S<sub>g</sub> + S<sub>p</sub> - I, where:

$$S_p = Y - T - C \dots \dots \dots (4a) \quad S_g = T - G \dots \dots \dots (4b)$$

where T is government tax revenue. Substituting equation 4a and 4b into equation 3 yields:

$$CA = (S_p - I) - (G - T) \dots \dots \dots (5)$$

where the term (G-T) is indicative of budget deficit. This equation can directly be interpreted as the current account balance being equivalent to the difference between excess savings over investment, and budget deficit. This equation implies that a rise in fiscal deficit (G-T) that decrease total national savings worsens the current account balance. Holding both (S<sub>p</sub> - I) and tax revenue constant, a temporary increase in government expenditure implies a rise in fiscal deficit, which affects the current account positively. Thus increased purchases by government worsen the external balance as the nation’s current account surplus reduces.

## 4.2. Empirical Model

Using data from 14 West African countries (9 Francophone<sup>8</sup> and 5 Non-Francophone<sup>9</sup>) Our model specification for evaluation of twin deficits hypothesis combines both panel data approach and time series approach for individual country estimates. We adapt the approach in Afonso and Rault (2009), which is based on a bivariate specification composed of current account balance, *cad*; and budget deficit, *bud*. The original Bootstrap panel granger-causality between government budget and external deficits primarily focused the relationship between these two phenomena. The suitability of this approach lies in that it allows for the testing of the four strands of outcomes that characterizes the literature. In the recognition of the need to account for the channels through which the effects are transmitted, modification was made to include exchange rate and interest rate variables. Thus, the paper included multivariate specification in equations 7a and 7b, composed of *cad*; *bud*; and real effective exchange rate, *exr*, interest rate, *ir*. We proceed in this approach by specifying a vector autoregressive (VAR) system form of the current account-budget deficits model as below:

$$cad_{it} = \alpha_i + \sum_{j=1}^{p1i} \beta_{i,j} cad_{i,t-j} + \sum_{j=1}^{p2i} \gamma_{i,j} bud_{i,t-j} + \varepsilon_{i,t} \quad t = 1, 2, \dots, T; i = 1, 2, \dots, N \quad \dots \dots \dots (6a)$$

$$bud_{it} = \alpha_i + \sum_{j=1}^{p1i} \delta_{i,j} cad_{i,t-j} + \sum_{j=1}^{p2i} \lambda_{i,j} bud_{i,t-j} + \mu_{i,t} \quad t = 1, 2, \dots, T; i = 1, 2, \dots, N \quad \dots \dots \dots (6b)$$

$$cad_{it} = \alpha_i + \sum_{j=1}^{p1i} \beta_{i,j} cad_{i,t-j} + \sum_{j=1}^{p2i} \gamma_{i,j} bud_{i,t-j} + \sum_{j=1}^{p3i} rex_{i,t-j} + \sum_{j=1}^{p4i} int_{i,t-j} + v_{i,t} \quad \dots \dots \dots (7a)$$

$$bud_{it} = \alpha_i + \sum_{j=1}^{p1i} \beta_{i,j} cad_{i,t-j} + \sum_{j=1}^{p2i} \gamma_{i,j} bud_{i,t-j} + \sum_{j=1}^{p3i} rex_{i,t-j} + \sum_{j=1}^{p4i} int_{i,t-j} + \omega_{i,t} \quad \dots \dots \dots (7b)$$

where countries are denoted by index *i* (*i*=1, ..., *N*), the period by *t* (*t*=1, ..., *T*), and the variable lags by *j*, with maximum lags represented by *p1<sub>i</sub>*, *p2<sub>i</sub>*, *p3<sub>i</sub>*, and *p4<sub>i</sub>* for *cad<sub>ij</sub>*, *bud<sub>ij</sub>*, *rex<sub>ij</sub>*, and *ir<sub>ij</sub>*, respectively. The index *i* for countries is suppressed for single country estimate. The error terms  $\varepsilon_{i,t}$ ,  $\mu_{i,t}$ ,  $v_{i,t}$ , and  $\omega_{i,t}$  are assumed to be white-noises (i.e. they have zero means, constant variances and are individually serially uncorrelated), though may be correlated for individual country, but not across countries. The report of the VAR estimates is preceded by determination of the unit root properties of the each variables series, and the Granger causality

<sup>8</sup> Benin, Burkina Faso, Cote D'Ivoire, Guinea Bissau, Mali, Mauritania, Niger, Senegal, Togo.

<sup>9</sup> Gambia, Ghana, Guinea, Nigeria, Sierra Leone.



test. The estimation procedure adopted in the analysis rest on application VAR technique to time series data for individual country estimates, to panel data from country groupings.

## V. Empirical Results

### 5.1 Unit Root Test

To avoid spurious estimation we test for the stationary properties of the variables using the Dickey Fuller (ADF) test. We present in Table 1 the unit root tests of the variables tested for each country included in the study in addition to collective test as a panel. We also tested for sub-samples defined along the Anglophone<sup>10</sup> and Francophone<sup>11</sup> countries dichotomy. Both budget deficit and current account deficit variables are stationary at levels for the pool data, while the exchange rate and interest rate variables are only stationary at first difference. For individual countries the stationary properties of the variables varies. The budget deficit variable turned out to be stationary in eight countries, while it is only stationary after first difference in the remaining six countries. The current account variable is stationary at level for five countries and stationary at first difference for the other nine countries. Apart from exchange rate variable being stationary at level for Ghana, this variable and interest rate variable only became stationary after first difference. Given the non-uniform stationarity properties of all the series under investigation, testing for the presence of cointegration for the four-dimensional vector in each country will be unnecessary. Thus we move straight to Granger causality test to ascertain the direction of relationship among the series.

### 5.2 Granger Causality Test

The Granger causality test to determine the direction of influence of the variables on one another was conducted. We report in tables 2 the results for Granger causality test among the variables. These tables present result for individual country, as well as country groups Francophone and Anglophone, and full sample. It is apparent from results in table 2 that there is Granger causality between budget deficit and current account deficit at 5% significance level for majority of the countries, except for Benin, Burkina Faso, Gambia, Guinea, and Sierra Leone. In fact, there exists feedback on the causal relationship between the two variables (*bud\_cad*) for four countries: Guinea Bissau, Niger, Nigeria, and Senegal. This two-way causality between the two deficits is also corroborated by a number of studies<sup>12</sup>. Moreover, Khalid and Teo (1999) argued that a high correspondence between the two deficits is more likely to occur in the developing rather than the developed economies.

Our results uncover the existence of bidirectional Granger causality between the two deficits, in the full panel sample and the Francophone countries panel sample, while the inverse relationship of Granger causality from current account deficit to budget deficit is established for the Anglophone countries panel sample. Although the estimated results showed a direct association between these variables, the causality tests conducted for individual countries diverse. The existence of Keynesian hypothesis of one-way Granger causality from

---

<sup>10</sup> Gambia, Ghana, Guinea, Nigeria, Sierra Leone

<sup>11</sup> Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Mauritania, Niger, Senegal, and Togo

<sup>12</sup> Darrat (1988); Kearney and Monadjemi (1990); Anoruo and Ramchander (1998); Khalid and Teo (1999); Normandin (1999); and Mukhtar, et al. (2007)

government budget deficit to current account deficit is found for two countries: Ghana, and Mali. A two-way causality is detected between the twin deficits in respect of five countries: Guinea Bissau, Mauritania, Niger, Nigeria and Senegal. This gives credence to both twin deficits and current account targeting propositions in which budget cuts improve current account and this further leads to a further reduction in budget deficit. A unidirectional causality (from the current account deficit to budget deficit) was the case for Cote D'Ivoire and Togo, which implies the main drive of fiscal indiscipline in these countries, is the trade imbalances they tend to grapple with. As for Benin, Burkina Faso, Gambia, Guinea, and Sierra Leone, the result showed that the two variables are statistically independent which confirms existence Ricardian Equivalent hypothesis of no relationship between the two deficits. This suggests that for these countries intertemporal shift between taxes and budget deficit does not matter for real interest rates, the quantity of investment or the current account balance.

### 5.3 Vector Autoregressive Results

To analyze the dynamic impact of changes in fiscal balances and current account balances on one another, we adopt a VAR specification estimation procedure. All variables that are not stationary in each of the sample estimates were made stationary for inclusion in our Granger causality tests and VAR analysis. In the bivariate estimates for country groupings analysis, between 48% and 72% of variations in the current account deficits are explained by the changes in budget deficit (see Table 3), while between 38% and 66% of variation in budget deficits are accounted for by variations in the current account deficit (see Table 4). The adjusted R-Square slightly improved in the multivariate estimates indication that the inclusion of real exchange rate and interest rate variables assisted in explaining more of the variation in each of the dependent variables. Similarly, the individual country estimates shows differs variation in adjusted R-Square statistics. Between 28% and 62% of the variations in the dependent variable are explained by the model.

With few exceptions the significance of the variables estimates support the causality direction indicated in the Granger causality test. The regression estimates were conducted for the full sample, and the country group samples, and for individual countries. We report in Tables 3 and 4 the bivariate estimates of the Keynesian twin deficits hypothesis and inverse relation, respectively. The multivariate estimates for the two are reported in Tables 5 and 6, respectively. The optimal lag length for the three group estimates is two for bivariate specification and three for the multivariate specification. We separately estimated bivariate specification involving budget deficit and current account deficit, and multivariate specification with exchange rate and interest rate as additional variables. For the full sample estimates and the two country groups sample estimates, the results from the bivariate and expanded multivariate specification did not significantly differ, except in the inverse relation specification. In the bivariate specification for government fiscal deficit running to current account deficit, for the full panel sample and the country group panel samples, a percentage point change in budget deficit results in between 0.32 and 0.40 percentage point change in the current account balance. The specification, in which current account deficit runs to budget deficit, a percentage point change in the current account deficit aggravates the government budget deficit by between 0.58 and 0.69 percentage point. There appears to be evidence in support of exchange rate and interest rate as a veritable transmission mechanism from budget deficits to current account deficit, but does not hold for inverse relationship from current

account deficit to budget deficits. The coefficients of both exchange rate and interest rate in both estimations are significant in the Keynesian hypothesis estimates, while they are not significantly different from zero in the inverse relationship between the twin deficits. This is suggestive of the fact that budget deficit exhibit influences on the interest rate, which affects the terms of trade and exchange rate, thus leading to a deterioration of the current account balance.

Though the panel analysis results suggest some support for the twin-deficits hypothesis, the strength of the relationship varies across countries. In agreement with the Granger causality test results, the individual country estimates shows diverse results. In the bivariate specification, the optimal lag length is generally one, with the exception of Senegal where lag two applies. The evidence in support of Keynesian hypothesis of twin deficits running from government budget deficit to current account deficit is found for eight countries: Ghana, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Nigeria and Senegal. For Senegal, the impact of budget deficit on current account balances is delayed two periods, with a one percentage point change in budget deficit worsening the current account balances by 0.58 percentage point. For the rest of these countries, a one percentage point in budget deficit exacerbate the current account deficit by between 0.12 and 0.42 percentage point with lag of one period.

Our results also uncover existence of inverse twin deficits relationship, running from current account deficit to budget deficit for seven countries: Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mauritania, Niger, Nigeria, and Senegal. The results show that a one percentage change in current account deficit elicits between 0.09 and 0.40 percentage point worsening of fiscal balances.

For the multivariate specification, the optimal lag length remain generally at one, but lag length two applies for Gambia and Nigeria, while optimal lag length for Niger is three. We report in Table 5, the multivariate specification of twin deficits link running from budget deficit to current account deficit and inverse relation running from current account deficits to budget deficit in Table 6. The indirect effect of the variables influencing one another through exchange rate and interest rate is supported by our results only for budget deficit running to current account deficit. The coefficients of both mediating variables were found to be significantly different from zero for substantial number of countries. The results for the countries were generally not different from the bivariate VAR estimates, with exception of Guinea and Niger, as the budget deficit retains the same pattern of significance. The results show that a one percentage change in budget deficit ignites between 0.01 and 0.42 percentage point worsening of current account balances. This suggests that budget deficits directly affect interest rates in the domestic market, which in turn causes appreciation of the exchange rate. This influences the terms of trade and contribute to the deterioration of the current account. The need to control budget deficit in order to achieve a viable current account balance is obvious from this result. For VAR estimation running from current account deficit to budget deficit, the existence of indirect mechanism through which the deficits influence one another is not supported (see Table 6). Both exchange rate and interest rate variables were generally not significantly different from zero. Also this direction of impact is only supported in few countries: Senegal, Sierra Leone, and Togo.

## **VI Conclusion and Policy Implications**

This study focuses on the twin deficits hypothesis in 14 WA countries. We investigated the existence of Granger-causality between current account and fiscal deficit, with and without considering the effective real exchange rate and interest rate, over the period 1970-2008. The following conclusions were arrived at from the empirical evidence based on the Granger causality tests and VAR regression analysis. While the panel estimates for the country groupings show existence of bidirectional causality for the region, there are evidences of existence of different hypothesized relationship for different countries.

There are two major channels through which budget deficit affects the current account of these countries. The first is the direct causal link from budget deficit to current account deficit and second, is the indirect channel that runs from budget deficit to higher interest rate to appreciation of the currency, which in turn worsens the current account deficit. There are evidences to suggest that some of the countries adopted budget deficit to target their current account balances over the period investigated as indicated by causality results running from budget deficit to current account deficit and supported by the VAR estimation. However, only direct channel through which current account deficit affects budget deficit is confirmed, while the indirect channels were not supported.

A two-way causality is detected between the twin deficits in respect of five countries, giving credence to both twin deficits and current account targeting propositions in which budget cuts improve current account and this further leads to a further reduction in budget deficit. With the Ricardian hypothesis found for another set of five countries, there are evidences that inter-temporal shift between taxes and budget deficit does not matter for real interest rates, the quantity of investment or the current account balance.

The results suggest that the twin deficits can be mutually interdependent. The causality pattern of the twin deficits structure supports multivariate analysis rather than the standard bivariate analysis, but limited to causality running from budget deficit to current account deficit.

From policy perspective, the empirical evidence suggests that a high interest rate ignited by increase in budget deficit results in appreciation of the currency, which leads to current account deficit. This is indicative of the fact that exchange rate Granger-cause current account deficit directly and interest rate seems to cause current account deficit through exchange rate. Thus, it is clear that fiscal tightening (budget cuts) tends to be one policy measure for correcting the current account deficit directly as well as indirectly through interest and exchange rates in more than half of the countries covered.

## References

Abbas, S. M. A., J. Bouhga-Hagbe, A. J. Fatas, P. Mauro, and R. C. Velloso (2010), "Fiscal policy and the Current Account", IMF Working Paper, WP/10/121.

Abell, J.D. (1990), "Twin Deficits During the 1980s: An Empirical Investigation", *Journal of Macroeconomics*, 12: 81-96.

Afonso, A. and C. Rault (2009), "Bootstrap Panel Granger-Causality between Government Budget and External Deficits for the EU", CESIFO WORKING PAPER NO. 2581, Category 6: Fiscal Policy, Macroeconomics and Growth. Available at: *website: [www.SSRN.com](http://www.SSRN.com); [www.RePEc.org](http://www.RePEc.org); [Twww.CESifo-group.org/wp](http://Twww.CESifo-group.org/wp).*

- Alkswani, M.A. (2000) *The Twin Deficits Phenominon in Petroleum Economy: Evidence from Saudi Arabia*, Presented at the Seventh Annual conference, Economic Research Forum (ERF) 26-29 October, Amman Jordan.
- Anoruo, E. and S. Ramchander (1998), “Current Account and Fiscal Deficits: Evidence from Five Developing Economics of Asia”, *Journal of Asian economics*, 9(3) 487-99.
- Barro, R.J. (1974) “Are Government Bonds Net Wealth?”, *Journal of Political Economy* 82: 1095-1117.
- Bartoli, G. 1989. "Fiscal Expansion and External Current Account Imbalances". In Blejer, M.I. and K. Chu eds., *Fiscal Policy, Stabilization and Growth in Developing Countries*. Washington, D.C.: International Monetary Fund
- Bartolini, L. and A. Lahiri (2006), “Twin Deficits, Twenty Years Later”, *Current Issues in Economics and Finance*, 12 (7): 1-7. Federal Reserve Bank of New York.
- Beetsma, R., M. Giuliadori, and F. Klaassen, (2007), “The Effects of Public Spending Shocks on Trade Balances and Budget Deficits in the European Union,” *Journal of the European Economic Association*, April–May 2008, Vol. 6, No. 2–3, pp. 414–23.
- Bernheim, B. (1988). “Budget Deficits and the Balance of Trade”, *Tax Policy and the Economy*, 2.
- Bruton, H. (1989): “Import Substitution” In Chenery, H. and T. N. Srinivasan (eds) *Handbook of Development Economics*, II. Amsterdam: North-Holland. pp. 1602-1641.
- Buchanan, J. M. (1976) “Barro on the Ricardian Equivalent Theorem”, *Journal of political Economy* 84: 337-342
- Cavallo, M. (2005), *Government Consumption Expenditure and the Current Account*, FRBSF Working paper 2005-3. <http://www.frbsf.org/publications/economics/paper/2005/wp05-03bk.pdf>
- Cavallo, M. (2005), “Government Consumption Expenditures and the Current Account, *Federal Reserve Bank of San Francisco Working Paper 2005-03*, February.
- Corsetti, G. and Müller, G. (2006). “Twin Deficits: Squaring Theory, Evidence and Common Sense”, *Economic Policy*, 21 (48), 597-638.
- Erceg, C. J., L. Guerrieri, and C. Gust (2005), *Expansionary Fiscal Shocks and Trade Deficit*, International Finance Discussion Paper No. 825, Federal Reserve Board.
- Evans, P. and Hasan I. (1994) “Are Consumers Ricardian? Evidence for Canada” *Quarterly Review of Economics and Statistics* 72: 373-381
- Gramlich, E.M. (2004), “Budget and Trade Deficits: Linked, Both Worrisome in the Long Run, But Not Twins”, Isenberg School of Management Seminar Series, Amherst, Massachusetts, 14 May.
- Kaufmann, S, J. Scharler, G. Winckler, (2002), “The Austrian Current Account Deficit: Driven by Twin Deficits or by Intertemporal Expenditure Allocation?”, *Empirical Economics* 27: 529-42.



- Kearney, C. and M. Monadjemi (1990) "Fiscal Policy and Current Account Performance: International Evidence on the Twin Deficits", *Journal of Macroeconomics*, 12(2): 197-219.
- Khalid, A. M. and W. G. Toe (1999) "Causality Tests of Budget and Current Account Deficits: Cross-Country Comparisons", *Empirical Economics* 24: 389-402.
- Kim, S. and N. Roubini (2008), "Twin Deficit or Twin Divergence? Fiscal policy, Current Account, and Real Exchange Rate in the U.S.", *Journal of International Economics* 74, 362-383.
- Mansur, Ahsan H. 1989. "Effects of a Budget Deficit on the Current Account Balance: The Case of the Philippines". In Blejer, M.I. and K. Chu eds. *Fiscal Policy, Stabilization and Growth in Developing Countries*. Washington, D.C.: International Monetary Fund. Chapter 12: 309 - 345.
- Marzinotto, B. (2012) "Current account imbalances: the role of competitiveness and of financial Sector dynamics in Part II of Economic Governance and Financial Regulations, Available @ <http://www.institutdelors.eu/media/tgae20112cmarzinotto.pdf?pdf=ok>
- McCosky, S. and C. Kao, (1999), "Comparing Panel Data Cointegration Tests with an Application of the Twin Deficits Problem", Working Paper, Center for Policy Research, Syracuse University, New York.
- Miller, S. M. and F. S. Russek (1989), "Are the Twin Deficits Really Related? ", *Contemporary Policy Issues*, 8, 91-114.
- Monacelli, T., and R. Perotti, (2007), "Fiscal Policy, the Trade Balance, and the Real Exchange Rate: Implications for International Risk Sharing," Università Bocconi, Milan, Italy.
- Morgan, D.R. 1979. "Fiscal Policy in Oil Exporting Countries, 1972—78 *IMF Staff Papers*, vol. 26: 55—86.
- Mukhtar, T., M. Zakaria, and M. Ahmed (2007) "An Empirical Investigation for the Twin Deficits Hypothesis in Pakistan", *Journal of Economic Cooperation*, 28 (4): 63-80.
- Nickel C. and I. Vansteenkiste (2008) "Fiscal Policies, the Current Account and Ricardian Equivalence", *Working Paper Series, European Central Bank*, No. 835.
- OECD 2012, "The Impact of Structural Reforms on Current Account Imbalances", OECD Economics Department Policy Notes, No. 3.
- Pahlavani, M. and A. S. Saleh (2009), "Budget Deficits and Current Account Deficits in the Philippines: A Casual Relationship?" *American Journal of Applied Sciences* 6 (8).
- Piersanti, G. (2000). "Current Account Dynamics and Expected Future Budget Deficits: Some International Evidence", *Journal of International Money and Finance*, 19 (2), 255-271.
- Pires J. (2010) "Economics of OECD Countries US Budget and Current Account", [http://www.economics.ox.ac.uk/members/christopher.bowdler/oecd/Lecture\\_USdeficits\\_Final%20Compatibility%20Mode.pdf](http://www.economics.ox.ac.uk/members/christopher.bowdler/oecd/Lecture_USdeficits_Final%20Compatibility%20Mode.pdf).
- Roubini, N. (1988), "Current Account and Budget Deficits in an Inter-temporal Model of Consumption and Taxation Smoothing: A solution to the 'Feldstein-Horioka Puzzle'?", NBER working paper 2773.

Salvatore, D. (2006), "Twin Deficits in the G-7 Countries and Global Structure Imbalances", *Journal of Policy Modeling* 28: 701-712.

Siddiqui, M.M. (2010) "Twin deficits: An Empirical Analysis in the Case of Pakistan" *World Applied Sciences Journal*, 8(11): 1398-1400.

Summers, L. (1988), "Tax Policy and International Competitiveness", in J.A. Frenkel (ed), *International Aspects of Fiscal Policies (NBER Conference Report)*, (Chicago: University of Chicago Press), 349-75.

Zaidi, I.M. (1985). "Savings, Investment, Fiscal Deficit, and The External Indebtedness of Developing Countries", *World Development*, Vol. 13: 573—588.

IBADAN UNIVERSITY LIBRARY

Table 1: Dickey Fuller ADF Unit Root Test Results

	BUDGET DEFICIT			CURRENT ACCOUNT DEFICIT			EXCHANGE RATE			INTEREST RATE		
	Level	1 <sup>ST</sup> Diff.	Rmk	Level	1 <sup>ST</sup> Diff.	Rmk	Level	1 <sup>ST</sup> Diff.	Rmk	Level	1 <sup>ST</sup> Diff.	Rmk
<b>Country Groupings</b>												
Full Sample	-4.2575*	-11.3228*	I(0)	-4.4334*	-6.1336*	I(0)	-1.2276	-4.7375*	I(1)	-2.0256	-7.5585*	I(1)
Anglophone Sample	-3.1826*	-6.2017*	I(0)	-3.9723*	-5.8191	I(0)	-0.092	-4.0719*	I(1)	-1.3467	-5.4736*	I(1)
Francophone Sample	-3.3569**	-8.1839*	I(0)	-3.3517*	-5.2618*	I(0)	-1.1733	-3.7022*	I(1)	-1.0718	-4.9447*	I(1)
<b>Individual Country Variables</b>												
Benin	-1.7908	-7.3752*	I(1)	-4.9529*	-7.3752*	I(0)	-1.0580	-5.2898*	I(1)	-1.8974	-6.8436*	I(1)
Burkina Faso	-2.8844***	-12.7958*	I(1)	-0.4886	-7.4479*	I(1)	-1.0580	-5.2898*	I(1)	-1.6363	-5.9001*	I(1)
Cote d'Ivoire	-2.5191	-5.8419*	I(1)	-1.8184	5.7843*	I(1)	-1.0580	-5.2898*	I(1)	-1.5980	-5.8415*	I(1)
Gambia	-4.1295*	-9.5253*	I(0)	-2.4133	-8.5838*	I(1)	-1.6276	-4.1355*	I(1)	-1.7960	-6.8040*	I(1)
Ghana	-2.8968***	-7.7858*	I(1)	-1.4269	-6.0038*	I(1)	-2.9577**	-4.8991*	I(0)	-1.7736	-7.2082*	I(1)
Guinea	-3.7575*	-9.3568*	I(0)	-0.7341	-3.2671**	I(1)	-0.8924	-5.7515*	I(1)	-2.1563	-6.9659*	I(1)
Guinea Bissau	-3.8300*	-5.9822*	I(0)	-2.5361	-6.5970*	I(1)	-1.0580	-5.2898*	I(1)	-1.5256	-6.5585*	I(1)
Mali	-4.0650*	-4.4504*	I(0)	-4.2703*	-8.4151	I(0)	-1.0580	-5.2898*	I(1)	-1.5768	-5.9747*	I(1)
Mauritania	-3.5682*	-6.7078*	I(0)	1.6920	-5.7554*	I(1)	-0.0770	-4.1790*	I(1)	1.7838	-2.9875**	I(1)
Niger	-4.0153*	-7.2577*	I(0)	-3.8490*	-6.9240*	I(0)	-1.0580	-5.2898*	I(1)	-1.5980	-5.8415*	I(1)
Nigeria	-2.8795***	-6.0223*	I(1)	-	-5.7897*	I(1)	-1.0595	-3.2258**	I(1)	-2.0539	-9.0410*	I(1)
Senegal	-4.4523*	-5.9363*	I(0)	-1.8963	-7.9376*	I(1)	-1.0580	-5.2898*	I(1)	-1.5980	-5.8415*	I(1)
Sierra Leone	-5.3717*	6.1897*	I(0)	-3.6510*	-8.7856*	I(0)	-1.6453	-	I(1)	-1.0167	-4.9536*	I(1)
								2.5991***				

Notes: \*\*\*, \*\* and \* denotes significance at the 1%, 5% and 10% levels, respectively.

**Table 2: Granger Causality running from Budget deficit to current account deficit**

Dependent Variable	BUD	CAD	EXR	IR
<b>WALD (F-statistics)</b>				
<b>Full Sample (k=3)</b>				
BUD		9.6437***(0.0000)	0.5222(0.5935)	3.4826**(0.0315)
CAD	5.6459***(0.0038)		0.2413(0.7857)	0.5972(0.5508)
EXR	3.2769**(0.0385)	2.5531*(0.0789)		1.3492(0.2604)
IR	5.3617***(0.0050)	2.8467*(0.0590)	0.4811(0.6184)	
<b>Francophone Countries Sample (k=3)</b>				
BUD		3.1266**(0.0465)	0.4874(0.6150)	0.432190.6498)
CAD	2.1180(0.1236)		0.2122(0.8090)	0.6695(0.5134)
EXR	5.9835***(0.0030)	1.6338(0.1984)		1.2p38(0.3024)
IR	1.9886(0.1399)	0.0872(0.9166)	0.4719(0.6246)	
<b>Anglophone Countries Sample (k=3)</b>				
BUD		9.5329***(0.0001)	0.1121(0.8940)	4.5246***(0.0115)
CAD	12.9454***(0.0000)		0.26944(0.7640)	5.2426***(0.0058)
EXR	2.1148(0.1223)	0.3272(0.7212)		0.5189(0.5957)
IR	13.4280***(0.0000)	4.9529***(0.0076)	0.8171(0.4426)	
<b>Benin (k=1)</b>				
BUD		0.0851(0.7725)	3.5097*(0.0694)	2.8562*(0.0999)
CAD	0.4356(0.5142)		0.1864(0.6689)	0.6502(0.4262)
EXR	1.8287(0.1850)	0.1132(0.7388)		3.6767*(0.0634)
IR	1.2175(0.2774)	0.1127(0.7393)	0.3302(0.5692)	
<b>Burkina Faso (k=1)</b>				
BUD		0.5490(0.4643)	3.5294***(0.0686)	0.2390(0.6280)
CAD	0.5358(0.4697)		0.0678(0.7964)	2.0128(0.1660)
EXR	1.4881(0.2307)	2.1670(0.1511)		10.7222*** (0.0024)
IR	0.1029(0.7503)	5.6380** (0.0239)	2.4478(0.1267)	
<b>Cote d'Ivoire (k=1)</b>				
BUD		0.9159(0.4107)	13.3412*** (0.0008)	0.5089(0.4803)
CAD	6.0565*** (0.0034)		5.4832*** (0.0254)	31.2392*** (0.0000)
EXR	8.4067*** (0.0064)	9.1463*** (0.0048)*		11.2928*** (0.0019)
IR	0.7924(0.3794)	0.0057(0.9404)	2.4970(0.1231)	
<b>Gambia, The (k=1)</b>				
BUD		0.8497(0.4383)	1.1618(0.3258)	2.5711*(0.0922)
CAD	1.2542(0.3008)		0.8853(0.4238)	3.0379*(0.0640)
EXR	0.9978(0.3799)	1.7975(0.1843)		7.9573*** (0.0016)*
IR	0.0607(0.9412)	0.0535(0.9480)	0.4142(0.6644)	
<b>Ghana (k=1)</b>				
BUD		4.7634** (0.0365)	3.1311*(0.0870)	2.1670(0.1511)
CAD	0.4677(0.4990)		3.4539(0.0442)*	2.5708(0.1181)
EXR	3.1623*(0.0664)	1.0618(0.3105)		6.6176** (0.0040)*
IR	0.9906(0.3264)	2.0128(0.1660)	0.1516(0.6994)	
<b>Guinea (k=1)</b>				
BUD		0.0816(0.7772)	0.3722(0.5458)	1.1427(0.2924)
CAD	0.0183(0.1830)		0.3634(0.5513)	0.0032(0.9554)
EXR	0.1865(0.6685)	0.2315(0.6340)		11.2372*** (0.0019) *
IR	1.4498(0.2366)	0.0959(0.7591)	0.3820(0.5405)	

<b>Guinea Bissau (k=1)</b>				
BUD		7.4608***(0.0100)	2.1171(0.1546)	0.0172(0.8964)
CAD	4.7692**(0.0358)		0.0118(0.9141)	2.2503(0.1431)
EXR	1.1572(0.2894)	8.3128***(0.0069)		3.5996*(0.0661)
IR	3.5690*(0.0672)	1.4876(0.2312)	0.0400(0.8426)	
<b>Mali (k=1)</b>				
BUD		6.1744**(0.0182)*	1.0109(0.3216)	0.2397(0.6275)
CAD	0.0590(0.4803)		3.1456*(0.0855)	2.1339(0.1260)
EXR	2.8145(0.1023)	2.0564(0.1604)		11.5081*** (0.0017)
IR	0.3725(0.4725)	1.7400(0.1957)	2.4934(0.1233)	
<b>Mauritania (k=1)</b>				
BUD		0.5260(0.4734)	0.0172(0.8966)	0.0313(0.8605)
CAD	4.6168**(0.0391)		1.8858(0.1789)	4.9086**(0.0337)
EXR	3.1999*(0.0823)	10.6172*** (0.0026)		4.9888**(0.0320)
IR	3.2654*(0.0794)	3.5273*(0.0692)	0.3722(0.5457)	
<b>Niger (k=1)</b>				
BUD		5.6610**(0.0229)	3.1436*(0.0855)	1.7708(0.1875)
CAD	6.1678**(0.0179)		2.3295*(0.0951)	3.3872**(0.0313)*
EXR	0.5408(0.6582)	2.5961*(0.0715)		5.7236*** (0.0033)*
IR	3.5294*(0.0686)	1.0957(0.3028)	0.3882(0.7624)	
<b>Nigeria (k=1)</b>				
BUD		6.6176*** (0.0040)	0.7871(0.4638)	3.8425*(0.0587)
CAD	4.7634**(0.0365)		2.9417*(0.0957)	1.2715(0.2979)
EXR	5.9929*** (0.0029)	2.1043(0.1396)		3.9829**(0.0285)
IR	5.9693*** (0.0063)	0.7162(0.4968)	1.3809(0.2659)	
<b>Senegal (k=2)</b>				
BUD		4.7692**(0.0358)	1.3781(0.2483)	1.1047(0.3004)
CAD	6.2193**(0.0175)		2.0276(0.1633)	1.5227(0.2254)
EXR	0.1392(0.2483)	0.0004(0.9848)		11.2928*** (0.0019)
IR	2.6091(0.1152)	0.2951(0.5904)	2.4970(0.1231)	
<b>Sierra Leone (k=1)</b>				
BUD		0.0182(0.8936)	0.3872(0.5378)	0.0260(0.8729)
CAD	0.9506(0.3367)		0.6098(0.4404)	0.3927(0.5352)
EXR	0.2303(0.6343)	0.1753(0.6781)		3.4541*(0.0715)
IR	1.9414(0.1723)	4.8693**(0.0344)	4.1342**(0.0497)*	
<b>Togo (k=1)</b>				
BUD		0.7128(0.4044)	2.8878*(0.0981)	0.0295(0.8646)
CAD	5.6380**(0.0239)		8.4067*** (0.0064)	0.6599(0.4221)
EXR	3.9646**(0.0543)	0.1352(0.7153)		11.2928*** (0.0019)
IR	0.7789(0.3835)	0.3923(0.5352)	2.4970(0.1231)	

Notes: \*\*\*, \*\* and \* denotes significance at the 1%, 5% and 10% levels, respectively. k = optimal lag length.



Table 3: Bivariate (CAD, BUD) Model Estimation Results from Budget Deficit to Current Account Deficit

	BUD (-1)	BUD (-2)	CAD (-1)	CAD (-2)	Constant	Adj R <sup>2</sup>
<b>Country Groupings</b>						
Anglophone	0.3236** (2.2102)	-0.3321 (-2.3031)	0.5846*** (6.8836)	0.1726** (2.0210)	-0.0122 (-1.4199)	0.48
Francophone	0.4047*** (3.9431)	-0.0831 (-0.7987)	0.5743*** (10.5482)	0.1702*** (3.1956)	-0.0111*** (-2.4765)	0.72
Full Sample	0.3581*** (4.3781)	-0.2136 (-2.5727)	0.6076*** (13.4151)	0.1976*** (4.4393)	-0.0092*** (-2.2799)	0.66
<b>Individual Country Estimates</b>						
Benin	0.1823 (0.4059)		-0.2992* (-1.7210)		0.0067 (0.3242)	0.49
Burkina Faso	0.0177 (0.0569)		1.0274*** (8.5823)		0.0147 (0.4561)	0.34
Cote d'Ivoire	0.1709 (0.9608)		0.8733*** (6.7037)		-0.0111 (-1.2064)	0.28
Gambia	-0.0457 (-0.1137)		0.7489*** (6.8903)		-0.0141** (-0.6813)	0.39
Ghana	0.1444** (2.5718)		0.8161*** (4.2192)		-0.0201 (-1.6654)	0.41
Guinea	0.1572** (2.2857)		0.6971 (1.5724)		-0.0327 (-0.9943)	0.32
Guinea Bissau	0.4247** (2.7315)		0.5165*** (4.0109)		0.0053 (0.0974)	0.47
Mali	0.2998*** (2.9766)		0.2976* (1.9335)		-0.0473*** (-3.2682)	0.45
Mauritania	0.3342** (2.1043)		0.1694** (2.1487)		0.0100 (1.0014)	0.38
Niger	0.124*** (3.5867)		0.4046** (2.6133)		-0.0501*** (-3.4105)	0.48
Nigeria	0.3238*** (2.7151)		0.5029*** (3.3794)		0.0391* (1.8914)	0.46
Senegal	0.3334* (1.5940)	0.5810*** (2.8788)	0.7641*** (4.4651)	0.2044 (1.2557)	-0.0083 (-0.8411)	0.41
Sierra Leone	-0.0641 (-0.1348)		0.4365** (2.6185)		-0.0553 (-1.4652)	0.36
Togo	0.0530 (0.1287)		0.0738 (0.4426)		-0.0726*** (-2.6828)	0.44

NOTE: t-statistics in parenthesis, and \*\*\*, \*\* and \* denotes significance at the 1%, 5% and 10% levels, respectively.

Table 4: Bivariate (CAD, BUD) Model Estimation Results from Current Account Deficit to Budget Deficit

	BUD (-1)	BUD (-1)	CAD (-1)	CAD (-1)	Constant	Adj R <sup>2</sup>
<b>Country Groupings Estimates</b>						
Anglophone	0.6857*** (8.3263)	-0.0472 (-0.5819)	-0.0983** (-2.0581)	0.0693 (1.4435)	-0.0215*** (-4.4461)	0.38
Francophone	0.5788*** (10.2686)	0.0497 (0.8706)	0.0555* (1.8555)	0.0724** (2.4754)	-0.0033 (-1.3364)	0.66
Full Sample	0.6555*** (14.2116)	0.0475 (1.0150)	-0.0096 (-0.3744)	0.0648** (2.5820)	-0.0096*** (-4.2365)	0.56
<b>Individual Country Estimates</b>						
Benin	0.8314*** (7.9068)		-0.0085 (-0.1890)		-0.0063 (-1.1861)	
Burkina Faso	0.3995*** (2.2202)		0.1260* (1.8242)		-0.0043 (-1.056)	0.40
Cote d'Ivoire	0.5199*** (3.8078)		0.2461*** (2.4610)		-0.0018 (-0.2541)	0.45
Gambia	0.3165* (1.8379)		0.0397 (0.8532)		-0.0251*** (-2.8428)	0.39
Ghana	0.6942*** (4.5078)		-0.0806 (-0.6839)		-0.0171** (-2.3288)	0.42
Guinea	0.4422*** (2.6396)		-0.0183 (-0.1353)		-0.0227** (-2.2709)	0.51
Guinea Bissau	0.3057* (1.7434)		0.0901** (1.9976)		0.0765*** (-3.0348)	0.62
Mali	0.3711*** (2.3024)		0.0010 (0.0078)		-0.0274** (-2.3846)	0.38
Mauritania	0.1578 (0.7252)		0.4024*** (7.4283)		-0.0149 (-1.0920)	0.44
Niger	0.3769** (2.4086)		0.0408** (2.3569)		-0.0267** (-2.4645)	0.35
Nigeria	0.7469*** (5.2727)		0.1587** (2.4216)		-0.0124 (-0.7968)	0.53
Senegal	0.0657 (0.3718)	-0.2276 (-1.2128)	0.2883*** (3.8111)	0.1241 (0.8197)	0.0144 (1.5706)	0.47
Sierra Leone	0.0814 (0.4499)		-0.0619 (-0.9750)		-0.0778*** (-5.4186)	0.43
Togo	0.5297*** (3.7315)		0.0584*** (4.0176)		-0.0267*** (-2.8628)	0.37

NOTE: t-statistics in parenthesis, and \*\*\*, \*\* and \* denotes significance at the 1%, 5% and 10% levels, respectively.

Table5: Multivariate (CAD, BUD, EXR, IR) Model Estimation Results from Budget Deficit Running to Current Account Deficit

	BUD (-1)	BUD (-2)	BUD (-3)	CAD (-1)	CAD (-2)	CAD (-3)	EXR(-1)	EXR(-2)	EXR(-3)	IR(-1)	IR(-2)	IR(-3)	Constant	
<b>Country Groupings Estimates</b>														
Anglophone	0.3861** (2.4748)	-0.1737 (-0.9896)	-0.1627 (-1.0906)	0.4829*** (5.5361)	0.0983 (0.9800)	0.2009 (2.1955)	-0.0529 (-0.6069)	-0.0343 (-0.2396)	0.0854 (1.0433)	0.0555 (0.3625)	0.1088 (0.5367)	-0.1813 (-1.0996)	-0.0055 (- 0.3098)	0.47
Francophone	0.4048*** (3.9119)	-0.1731 (-1.4761)	0.0544 (0.5238)	0.4739*** (8.0160)	0.0583 (0.9133)	0.1117 (1.9839)	-14.3779** (-2.3221)	15.8154** (9.2916)	-3.9068 (-0.6497)	-0.3365*** (-3.3032)	0.3287*** (2.6653)	-0.1705 (-1.6678)	0.0051 (0.8009)	0.74
Full Sample	0.3820*** (4.5880)	-0.1875 (-1.9403)	-0.3900 (-0.4631)	0.5199*** (11.0181)	0.1016 (1.9271)	0.1851 (4.0550)	-0.06589 (-0.8687)	-0.0302 (-0.2425)	0.1058 (1.4965)	-0.1611* (-1.9229)	0.2736 (0.1067)	2.5640 (-1.6882)	-0.0052 (- 1.0145)	0.68
<b>Individual Country Estimates</b>														
Benin	-0.0170 (-0.0302)			0.1234 (0.6119)			-1.9114 (-0.1688)			-0.0879 (-0.1563)			-0.0551 (- 1.5658)	0.53
Burkina Faso	-0.3201 (-0.8961)			0.7509*** (5.1260)			5.4159*** (11.5446)			0.6744** (1.9812)			-0.097*** (-2.8353)	0.49
Cote d'Ivoire	0.4122** (2.4574)			0.3967** (2.3393)			32.995*** (-3.9137)			-0.4162 (-1.4153)			0.0821*** (2.7615)	0.56
Gambia	0.0109 (0.0240)	-0.7036 (-1.6316)		0.3569* (1.7452)	0.5621** (2.6269)		-0.6465 (-1.6110)	0.6822* (1.9338)		-0.1118 (-0.3197)	-0.0361 (-0.1043)		-0.0233 (- 0.3429)	0.59
Ghana	0.0068*** (3.1451)			0.7040 (0.0196)			0.0371** (2.0186)			0.0600*** (3.1146)			-0.0388 (-1.4178)	0.48
Guinea	-0.1903 (-0.3298)			0.7206 (1.5439)			0.2620 (0.3709)			0.0453 (0.0831)			-0.0437 (-0.4717)	0.51
Guinea Bissau	1.0537*** (3.1271)			0.1979 (1.2297)			-53.900*** (-2.6697)			-0.0828 (-0.5557)			0.0912* (1.6626)	0.54
Mali	0.4162** (2.0453)			0.0587 (0.3644)			13.248*** (2.8731)			-0.3524* (-1.8886)			-0.074*** (-3.8095)	0.48
Mauritania	0.2074*** (4.0473)			0.4435*** (3.1252)			-9.2027*** (-2.8241)			-0.8382 (-1.1045)			0.1323 (1.4443)	0.50
Niger	0.0083 (1.0294)	-0.1251 (-0.4489)	0.1006 (1.3767)	0.5232** (2.3059)	-0.1878 (-0.6886)	-0.0957 (-0.3347)	8.6079 (0.8282)	-32.294** (-2.2133)	22.9293 (2.0220)	0.4120 (0.6068)	-0.2150 (-0.2888)	-0.1443 (-0.3151)	-0.0686** (-2.2157)	0.51
Nigeria	0.3125 (1.0535)	0.5407** (2.0624)		0.5669*** (3.0478)	-0.1997 (-0.9881)		-0.0531 (-0.4210)	-0.1045 (-0.8557)		-0.2793 (-0.5066)	-1.1521** (-2.1025)		0.2716** (2.4295)	0.55
Senegal	0.4432** (2.1341)			0.7064*** (5.1149)			0.1583 (1.1140)			-0.8276 (-0.2711)			-0.0278** (-2.0961)	0.54
Sierra Leone	-0.1003 (-0.2176)			0.2107 (1.0938)			0.0006 (0.0207)			0.8656** (2.1050)			-0.16521 (-2.5019)	0.61
Togo	0.1076 (0.2426)			0.0744 (0.4349)			3.1985 (0.2608)			0.2524 (0.5270)			-0.0988** (-2.0629)	0.48

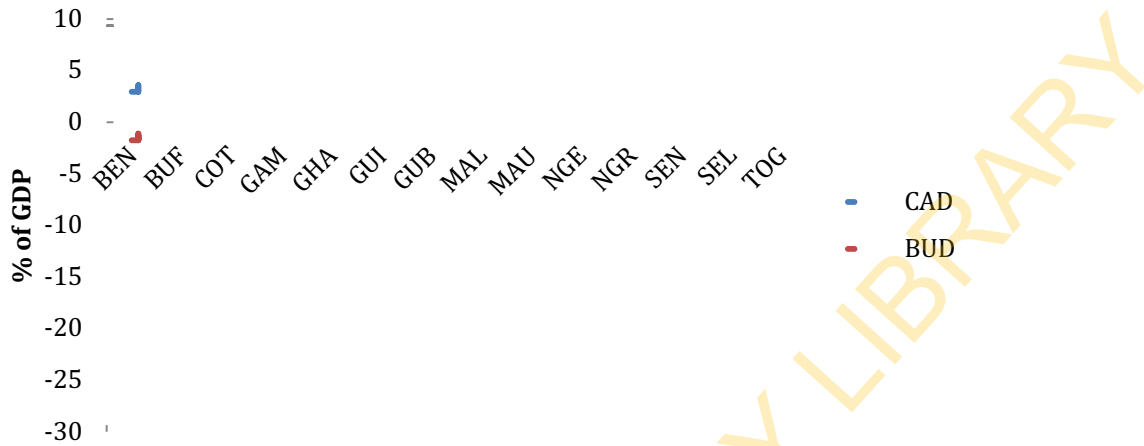
NOTE: t-statistics in parenthesis, and \*\*\*, \*\* and \* denotes significance at the 1%, 5% and 10% levels, respectively.

Table 6: Table5: Multivariate (CAD, BUD, EXR, IR) Model Estimation Results from Current Account Deficit Running to Budget Deficit

	BUD (-1)	BUD (-2)	BUD (-3)	CAD (-1)	CAD (-2)	CAD (-3)	EXR(-1)	EXR(-2)	EXR(-3)	IR(-1)	IR(-2)	IR(-3)	Constant	
<b>Country Groupings Estimates</b>														
Anglophone	0.5973*** (6.8775)	-0.0938 (-0.9597)	-0.0047 (-0.0572)	-0.0974** (-2.0054)	-0.0073 (-0.13050)	0.0883 (1.7328)	-0.0801* (-1.6518)	0.0218 (0.2658)	0.0236 (0.5186)	-0.1845** (-2.1706)	0.2511** (2.2243)	-0.0838 (-0.9132)	-0.0188* (-1.9027)	0.45
Francophone	0.5421*** (9.1935)	0.0037 (0.0558)	0.0306 (0.5171)	0.0266 (0.7898)	0.0420 (1.1531)	0.0620* (1.9311)	5.8902* (1.6694)	-13.052** (-2.4650)	8.0020** (2.33510)	0.0431 (0.7417)	-0.1224* (-1.7419)	0.0355 (0.6087)	-0.0043 (-1.1751)	0.66
Full Sample	0.5796*** (12.1104)	-0.0343 (-0.6176)	0.0452 (0.9331)	-0.0168 (-0.6190)	0.0175 (0.5764)	0.074*** (2.8176)	-0.05749 (-1.3187)	0.0003 (0.6258)	0.0254 (0.0037)	-0.059 (-1.2345)	-0.0092 (0.0613)	-0.0070 (-0.1418)	-0.0022 (-0.7419)	0.58
<b>Individual Country Estimates</b>														
Benin	0.5740*** (3.2676)			-0.0036 (-0.0573)			-3.0221 (-0.8543)			-0.2633 (-1.4982)			0.0119 (1.0832)	0.34
Burkina Faso	-0.0277 (-0.1457)			0.0070 (0.0903)			1.4997 (0.4202)			0.0998 (0.5506)			-0.0355* (-1.9455)	0.38
Cote d'Ivoire	0.4149*** (2.7474)			0.0550 (0.3602)			-11.7800 (-1.5521)			-0.2621 (-0.9901)			0.0386 (1.4426)	0.42
Gambia	0.1320 (0.6411)	0.0439 (0.2243)		0.1489 (1.6045)	0.0110 (0.1136)		-0.0093 (-0.0511)	0.1051 (0.6565)		-0.0825 (-0.5204)	0.1260 (0.8029)		-0.0508* (-1.6502)	0.44
Ghana	0.5892*** (2.7824)			-0.0681 (-0.4973)			-0.0051 (-0.2277)			-0.0548 (-0.7808)			-0.0083 (-0.4928)	0.35
Guinea	0.4966 (3.0286)			0.0238 (0.1791)			0.2231 (1.1112)			0.3000** (1.9638)			-0.0684** (-2.6005)	0.39
Guinea Bissau	0.3323* (1.8561)			0.0386 (0.4516)			3.0989** (2.2889)			-0.0867** (-1.9957)			-0.0728** (-2.4978)	0.42
Mali	0.2524 (1.4435)			0.0772 (0.5574)			-6.4849 (-1.6368)			-0.0116 (-0.0723)			-0.0063 (-0.3801)	0.46
Mauritania	0.2961* (1.7685)			0.1606 (1.3388)			1.4259 (0.5176)			0.5554 (0.8657)			-0.0519 (-0.6703)	0.39
Niger	0.2513 (1.2369)	-0.1069 (-0.5295)	-0.0802 (-0.4146)	-0.0722 (0.4389)	0.0602** (2.3047)	0.2317 (1.1185)	4.1387 (0.5496)	-7.2266 (-0.6836)	2.1110 (0.2569)	0.1719 (0.3494)	-0.3258 (-0.6039)	0.4361 (1.3144)	-0.0384* (-1.7148)	0.35
Nigeria	0.5893*** (2.9294)	-0.3493 (-1.9650)		0.1438 (1.1398)	0.0546 (0.3986)		0.0673 (0.0855)	0.0087 (0.1055)		0.2134 (0.5707)	0.0278 (0.0747)		-0.0400 (-0.5280)	0.37
Senegal	0.0538 (0.3201)			-0.1625** (-2.3092)			0.0063 (0.6037)			0.4170*** (2.7770)			-0.133*** (-5.5131)	0.41
Sierra Leone	0.0555 (0.1760)			0.2426** (2.0732)			-0.1073 (-0.8905)			-0.4849 (-0.1875)			0.0150 (1.3359)	0.44
Togo	0.4382*** (3.0321)			0.0657*** (3.1776)			-7.5534* (-1.8902)			-0.0536 (-0.3433)			-0.0053 (-0.3383)	0.39

NOTE: t-statistics in parenthesis, and \*\*\*, \*\* and \* denotes significance at the 1%, 5% and 10% levels, respectively.

**Fig 1: Average Current Account and Fiscal Balances of West African Countries (1970-2008)**



History of Budget Deficits and Current Account Deficits in 14 West African Countries

