

TWIN DEFICITS PHENOMENON IN WEST AFRICAN ECONOMIC AND MONETARY UNION COUNTRIES: PANEL DATA ANALYSIS

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ABSTRACT

For long period of time, West African Economic and Monetary Union (WAEMU) countries have been experiencing persistently high budget and current deficits. This study was undertaken to empirically test the “Twin Deficits Hypothesis” in these countries. The analysis is conducted within the framework of Panel VAR approach over the period 1975-2013. In contrast to the conventional view which claims a one-way relationship between budget and current account deficits, the results show that budget deficits leads to a deterioration in the current account balance, and vice-versa (bilateral relationship). In addition, the association between the two deficits appears stronger when grants (aid) are taken into account in the estimation. Overall, the relation between budget and current account deficits found in this study is weaker than expected. In assessing the transmission mechanism, we found that budget deficits impact on current account deficits mainly through imports, in line with the Keynesian absorption theory.

Keywords: Twin deficits, Budget deficit, Current account deficit, Panel VAR

INTRODUCTION

The simultaneousⁱ upsurge of budget and current account deficits of the US economy in the 1980's have sparked heightened interest of researchers and policy makers on the relation between budget and current account deficits. In the 1990s, some European countries, such as Sweden and Germany experienced similar situation where the increase in the budget deficit was accompanied by deterioration in their current account (Ibrahim and Kumah, 1996). Such a phenomenon is not exclusive to developed countries. Fiscal and external deficits are persistent features of developing economies in general and in particular of African economies. Fiscal deficit as percentage of GDP for developing countries increased from 5.3% in the 1970s to 6.4% in the 1980s and that of Africa increased from 6.4% to 7.5% during the same period. With a sample of 38 African countries, Osakwe and Verick (2007) found that the average current account deficit over the period 1970-2005 is 5.6% of GDP. To curb the rising budget and current account deficits in the 1980s, WAEMU (West African Economic and Monetary Union) countries, implemented IMF-supported stabilization programs over the period 1986-1993. The twin “deficit hypothesis” was the cornerstone of these programs. Under this assumption, there is a positive relationship between budget and external deficits and the budget deficit causes the external deficit; therefore, it is necessary to tackle budget deficits in order to control the external imbalances. The results of the stabilization programs were very disappointing and far from the targets. The budget deficit of the WAEMUⁱⁱ area was 9.6% of

ⁱ Budgetary deficits in US rose from USD 74 billion in 1980 to USD 221 billion in 1986. In the same period, the current account deficit rose from USD 30 billion to 140 billion. The term “twin deficits” was initially coined to describe this co-movement between the budget deficit and the current account deficit witnessed during the early 1980s in the US.

ⁱⁱ West African Economic and Monetary Union Countries. It includes 8 countries; Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, Togo.

GDP in 1993 while the current account deficit was 10.7% of GDP on average over the period 1990-1993 (Nubukpo, 2012). It is only under the impact of the devaluation in 1994 of the CFA Francⁱⁱⁱ which was pegged against France currency (French Franc) that the budget and the current account deficits of WAEMU are declined significantly. However, this downward trend of the current account deficit was reversed from 2006; it increased from 5.3% of GDP on average over the period 2000-2005 to 6.4% of GDP on average over the period 2006-2010 and 6.7% of GDP in 2013 (WAEMU commission report, 2013) while the macroeconomic convergence criteria adopted by the WAEMU zone require that the ratio of external deficit to GDP not be more than 5%. As pointed out by Corden (1994), there is less of concern if the current account deficit stems from private sector activity rather than fiscal imbalances. Thus, an in-depth analysis of the relationship that may exist between the budget deficit and the external deficit is crucial to ensure better targeting of corrective measures of the persistent current account deficits in this area. Therefore, this study addresses the following question: Is there any relationship between Government budget deficits and current account deficits in WAEMU area?

The aim of the present study is to examine the relationship that is likely to exist between budget and current account deficits in WAEMU zone with the purpose of formulating appropriate macroeconomic policies. In other words, the study aims to test the validity of the twin deficits hypothesis in this economic union. Specifically, the study aims to determine the effect of budget deficit on the current account balance, and vice-versa in WAEMU zone.

Empirical studies about the twin deficit phenomenon are quite scanty in the WAEMU area. To the best of our knowledge, no previous work has attempted to address “the twin deficits hypothesis” for the WAEMU countries, with the exception of Ayodele *et al.* (2002) and Diarra (2014). This is surprising given the persistent feature of the budget and external deficits in the economies of this zone. These previous attempts are extremely important in understanding the relationship between budget and current account deficits; however there still remains a significant research gap in regards to twin deficits phenomenon in the WAEMU countries. For example, these studies ignored completely aid (grants) in the analysis of the link between budget and current account deficits. In low-income countries grants are important source of financing for government expending. Ignoring them may produce results that are highly misleading for policy recommendations, because they do not provide an accurate reflection of what would happen to the current account if government changed the fiscal deficit holding aid constant. They omitted also some important variables thereby failing to explain the mechanisms by which budget and current account deficits influence each other. As pointed by Lau and Khalid (2006), the two deficits are known to cause macroeconomic imbalances which affect the long-run economic development of a nation. Accordingly, this article which revisits the twin deficits issue by taking into account the above mentioned shortcomings is relevant and timely for policy makers in WAEMU countries. It complements the previous studies by helping to deepen the understanding of macroeconomics dynamics in these economies and hence, formulate better calibrated macroeconomic policies to reduce significantly the persistent budget and current deficits.

The remainder of the paper is organized as follows: The following section provides a review of some relevant theoretical and empirical studies. The third highlights recent macroeconomic developments in WAEMU area over the last four decades, section 4 outlines the data and methodology used, Section 5 presents the empirical results, while the latter draws conclusions and outlines the major policy recommendations.

ⁱⁱⁱ CFA Franc is the common currency of West African Economic and Monetary Union (WAEMU) countries.

LITERATURE REVIEW

The study of twin deficits phenomenon has been the subject of many theoretical and empirical works and has regained growing interest in recent years. Despite these numerous studies on the relationship between budget deficit and current account balance, the results are so far inconclusive. In this section, we first present the theoretical approaches and then some significant empirical studies.

Theoretical literature

Before presenting the different theoretical approaches, it is important to present the macroeconomic identities which form the basis for modeling the relationship between the budget and current account deficits. To do this end, we consider an open economy with the GDP identity as follows:

$$GDP = C_p + I_p + C_g + I_g + X - M \quad (1)$$

Where subscripts ‘p’ and ‘g’ mean ‘private’ and ‘government’. The trade surplus/ deficit is related to the current account surplus/deficit by:

$$CADEF = X - M + NFP \quad (2)$$

where NFP is net factor payments to abroad. Government expenditures are related to the government deficit by:

$$GDEF = C_g + I_g + NFP_g - T \quad (3)$$

Where NFP_g is government net factor payments to abroad and T is tax revenue. Using these expressions (2) and (3) to substitute for the trade deficit and government expenditures in the national income accounting identity, we get the following accounting relationship between the current account and government deficits:

$$CADEF = GDEF - [GDP - NFP_p - T - C_p - I_p] \quad (4)$$

Where $NFP_p = NFP - NFP_g$.

The impact of an exogenous change in the government deficit on the current account deficit simply comes down to how the term in square brackets responds to the change in the government deficit.

To convert the above equation(4) into a more familiar expression, first, we split net current transfers received by the country into net current transfers received by the government and net current transfers received by the private sector:

$NCT = NCT_g + NCT_p$, Then we subtract NCT from both sides of equation (4). This gives us:

$$CADEF - NCT = (GDEF - NCT_g) - [S_p - I_p] \quad (5)$$

Where $S_p = GDP - NFP_p + NCT_p - T - C_p$ is private- sector saving.

The left-hand side of this equation (5) is the “current account deficit after grants”; it is the part that has to be financed by net capital inflows. The quantity in curved brackets is the “government deficit after grants”; it is the part that has to be financed by borrowing domestically, abroad or through seigniorage. Equation (5) depicts the basis of the twin-deficits idea. Several theoretical approaches have attempted to determine the relationship between budget and current account deficits (also known as twin deficits hypothesis).

According to the monetary approach to the Balance of Payments, fiscal deficits may increase the money supply. When money holdings exceed the economic agents' desired long term real monetary balances, spending and acquisition of foreign assets expands, which leads to the worsening of the current account.

For the New Cambridge School, also known as financial approach to the Balance of Payments, there is a positive relationship between budget and current account deficits and budget deficit totally causes the external deficit.

The Keynesian absorption theory suggests that an increase in the budget deficit would induce an increase in domestic absorption and hence import expansion, causing an increasing or worsening in the current account deficit.

The twin deficits hypothesis has also been analyzed within the framework of Mundell-Fleming theory. In this model, the increase in budget deficit leads to an upward trend in interest rates. This triggers a capital inflow which leads to an appreciation in the exchange rate. The appreciation of the exchange rate renders exports less attractive(expensive) and makes the imports more attractive(cheaper) .This leads to the deterioration in the current account balances under a flexible exchange rate regime. Under a fixed exchange rate regime, the budget deficit stimulus would generate higher real income or prices and this would worsen the current account balance. According to this approach, budget deficit can deteriorate the current account balances under both flexible and fixed exchange rate although the transmission mechanisms may differ^{iv}.

However,the Ricardian Equivalence hypothesis contests the conventional view of the twin deficits hypothesis. Under this hypothesis, there is no link between budget and current account deficits because government fiscal manoeuvres induce inter-temporal reallocation of savings, leaving private agents'inter-temporal budget constraints, real interest rate,investments, and current account unaffected. Indeed, government budget deficits do not lead to any interest rate and exchange rate changes, and therefore there are no effects on the current account balance (Algieri, 2013).Since the theory is oscillating between the Conventional View and the Ricardian Equivalence, many empirical studies have been interested in the relationship between the two deficits.

Empirical literature

The results of empirical studies are inconclusive and can be divided into four groups:

The first group of studies found positive relationship between budget and current account deficits and budget deficits cause the current account deficits (conventional view). Empirical literature on this subject includes Bianchi et al.(2015) in the case of G-7 countries; Abbas et al. (2011) for the case of a panel of developed and developing countries;Nargelecekenler et al. (2013) and Miteza (2012) for the case ofOECD countries (Organizations for Economic Co-operation and Development); Forte (2013) in the case of 33 European countries; Trachanas et al.(2013) in the case of Portugal, Ireland, Italy , Greece and Spain. One of the closest studies to ours in terms of econometric method is that of Beetsma , Giuliadori and Klaassen (2008).Using annual data and panel VAR, the results confirm the twin deficits hypothesis in the case of 14 European countries. Ayodele et al. (2002) covers 16 African countries (including WAEMU countries) over the period 1970-1999. They found a positive correlation between fiscal and external deficits in most of the countries in the sample.Diarra (2014)also examines the relationship between the primary budget deficit and the current

^{iv} For more extended details, see Salvatore (2006).

account deficit in the case of WAEMU countries using bound test cointegration method. The results show that there is a long-term causal relationship from primary deficit to the current account deficit. Akosah (2013) confirmed the conventional view in the case of Ghana.

The second group of studies found unidirectional causality from the current account deficit to the budget deficit. In other words, current account deficit is the main source of government budget deficit. Empirical literature on this subject includes Ekpenyong (2014) using Sub-Saharan Africa case study with panel data; Anas (2013) in the case of Morocco; Magazzino (2012) using Italy case study; Collin (2014) for the case of Eurozone; Sobrino (2013), Wong (2014), and Kalou and Paleologou (2012) respectively for the case of Peru and Malaysia.

The third group of studies found a bilateral relationship between the two deficits. It occurs when both budget and current account balances affect each other. In other words, budget deficit worsens the current account balance and the deterioration in the current account balance worsens the budget balance. Empirical literature on this subject includes Oladipo et al. (2012) in the case of Nigeria. Arize and Malindretos (2008) for the case of eight African countries; Chihi and Normandin (2013) in 24 developing countries in Africa, the Americas, Asia and Oceania.

Finally, some studies did not find any linkages between the two variables (Ricardian equivalence hypothesis). Empirical literature on this subject includes Jobert et al. (2005) for the case of Turkey; Kosimbei (2002) for Kenya case study. Similarly, Algieri (2013); Papadogonas and Stournaras (2006) did not discover any relationship between Government budget and current account balances in their studies.

In sum, it is clear from this literature review that the twin deficits issue is interesting and relevant. Although not exhaustive, it appears from the empirical literature that there is no final “verdict” about the link between Government budget and current account balances.

MACROECONOMIC DEVELOPMENTS IN WAEMU AREA: 1970-2013

Recent macroeconomic developments in WAEMU area can be divided into three periods from 1970. The 1970s was marked by the implementation of massive public investments, often funded by external debt in the context of petrodollars recycling. The investment rate of WAEMU area was more than 24% of GDP and the GDP growth oscillated between 6.8 % for Cote d'Ivoire to 4% in Togo. The excessive government involvement in the economies and the vulnerability of these economies to external shocks resulted in an economic and financial crisis in almost all the WAEMU countries in the 1980s.

The period 1980-1993 was that of economic and financial difficulties in the area. The real GDP growth rate was negative or zero in most of WAEMU countries. They also experienced chronic budget and current account deficits along with a high deterioration in the terms of trade. The overall average budget and current account deficits in the area were respectively 6% and 7.4% of GDP in the 1980s, while the deterioration in the terms of trade were (- 62.6) % for coffee and cocoa and (-33)% for cotton which are the main export products of these countries. These macroeconomic imbalances with inadequate external indebtedness policy became unmanageable for most of WAEMU countries in this period. For example, 65% of Cote d'Ivoire's (the leading economy in the area) fiscal revenue was absorbed in the payment of the foreign debt's interests.

To deal with such macroeconomic imbalances that have become unsustainable, the WAEMU countries, under the auspices of Bretton Woods institutions namely, IMF and the World Bank, implemented macroeconomic stabilization measures in order to reduce significantly

the role of the public sector in the economy and the persistent fiscal and current account deficits in the mid-1980s. Among these measures are the cuts in public spending, elimination of subsidies, reduction and high control of workers' payroll and agricultural reforms. The results of these macroeconomic stabilization programs were very disappointing and far from the targets. The average real GDP growth rate over the period 1980-1993 for all the WAEMU countries was 2% while the average population growth rate was 3%. The fiscal deficit was 9.6% of GDP in 1993 and the average current account deficit was 10.7 % of GDP over the period 1990-1993. In this context of persistent fiscal and external imbalances in most of the WAEMU countries, the devaluation of the CFA Franc which is the common currency of the Union was decided in 1994.

The post devaluation era (1994-2013) was that of further consolidation of the macroeconomic policies and the intensification of structural reforms. Significant results have been obtained: the inflation rate declined from 31% in 1994 to 3% in 1996 (Nubukpo, 2012). In 1996, the real GDP growth of all the countries in the Union, with the exception of Mali and Niger, was above 5% and the overall GDP growth of the Union was 5.7% in 2013. The overall fiscal revenue rose from 14% of GDP on average over the period 1997-2005 to 15.6% over the period 2009-2013.

The outstanding external debt declined from 88.4 % of GDP on average over the period 1997-2005 to 40.5 % of GDP over the period 2009-2013 due to debt relief from the HIPC (Heavily Indebted Poor Countries) initiative granted to WAEMU countries.

The budget deficit declined from 5% of GDP on average in the 1990s to 4.5 % over the period 2000-2005. However, it increased to 5.2% of GDP on average over the period 2006-2010 and 6.4% in 2013. As for the current account deficit, it was 6.9% of GDP on average over the period 1994-1999 and 5.3% over the period 2000-2005 before settling at 6.4% of GDP on average over the 2006-2010 and 6.7% in 2013. The current account deficit of the Union peaked at 8.6% of GDP in 2008 probably due to the economic and financial crisis that prevailed in this period.

For a complete presentation of the macroeconomic developments in WAEMU area, it is important to present a per country analysis in addition to the overall analysis. The Appendix 1 shows the trends of fiscal and external balances (excluding grants) of WAEMU countries over the period 1975-2013. From these trends, we noticed that budget and current account deficits are one of the common persistent features of these countries' economies. The magnitude of the budget and current account deficits (excluding grants) is very high for all the countries compared to the overall budget and current account deficits. Grants constitute an important source of financing government expenses in WAEMU countries. It helps to mitigate budget and current account deficits in these countries.

For example, Benin's overall budget deficit rose from an average of 4.7% of GDP over the period 1986 to 1993 to a surplus of 0.03 % over the period 1994 to 1999 before settling at (-1.7) % for the period 2000-2013 (Table 1) . But looking at the appendix 1, we can notice that like the other countries Benin's budget balance (excluding grants) never recorded a surplus over the period 1975-2013. Overall, Benin recorded a moderate level of budget deficit since the 1994 devaluation; this is due to the efforts of the government, with the assistance of development partners in the organization of the public finances sector, including tax reforms such as simplifying and updating of the tax code and the computerization of the financial services (IMF country Report, No 11/307).

Table 1. Budgets and Current account deficits (% of GDP) in WAEMU countries, 1986- 2013

| Countries | Budget Deficits ^a Averages | | | Trade Deficits Averages | | | Current account Deficits ^b Averages | | | Grants (% GDP) Averages | | |
|------------------|--|---------------|---------------|----------------------------|---------------|---------------|--|---------------|---------------|----------------------------|---------------|---------------|
| | 1986- 1993 | 1994- 1999 | 2000- 2013 | 1986- 1993 | 1994- 1999 | 2000- 2013 | 1986- 1993 | 1994- 1999 | 2000- 2013 | 1986- 1993 | 1994- 1999 | 2000- 2013 |
| Benin | -4,2 | -0,03 | -1,7 | -7,4 | -5,9 | -12,8 | -4,1 | -4,7 | -6,6 | 4,6 | 3,9 | 2,1 |
| Burkina Faso | -3,4 | -2,6 | -4,2 | -10,8 | -9,4 | -11,2 | -1,3 | -5,9 | -8,9 | 5,1 | 6,6 | 5,7 |
| Cote d'Ivoire | -11,5 | -3,1 | -1,5 | 10,3 | 14,8 | 8,6 | -9,1 | -1,7 | 1,8 | 0,5 | 0,7 | 0,9 |
| Mali | -5,7 | -2,7 | -3,0 | -4,7 | -2,4 | -7,8 | -9,7 | -9,2 | -7,8 | 5,9 | 6,2 | 6,3 |
| Niger | -5,0 | -3,7 | -2,5 | -0,46 | -2 | -11,5 | -8,4 | -7,1 | -12,1 | 4,9 | 5,0 | 5,9 |
| Senegal | -1,7 | -0,2 | -3,8 | -6,2 | -6,3 | -16,5 | -7,5 | -4,8 | -8,1 | 1,4 | 3,6 | 2,2 |
| Togo | -5,5 | -5,2 | -1,9 | -4,6 | -6,7 | -17,8 | -6,1 | -8,3 | -7,8 | 2,1 | 1,5 | 2,1 |

Source: World Bank Development indicators (2014), Author's computation

Note: **a**-budget deficits (including grants); **b**-current account deficits (including grants)

For the case of Burkina Faso, the overall budget deficit has deteriorated in recent years; it was 4.2% of GDP on average over the period 2000-2013 against 2.6 % over the period 1994-1999 and 3.4 % on average over the period 1986-1993 (Table 1). This situation can be explained by the increase in public expenditure over income. Government spending increased from 22.3% of GDP in 2005 to 29.6% in 2007, while budget revenue (including grants) increased from 12.7 % to 15.6 % of GDP over the same period. Since some years, the government of Burkina Faso is taking measures to increase its fiscal revenue as part of its Strategy for Strengthening the Public Finance sector (Annual Report of the CFA franc zone, 2010).

Through Table 1, we can notice that the economic and financial crisis of the 1980s in WAEMU countries was more severe in Cote d'Ivoire with an overall budget deficit of 11.5% of GDP over the period 1986-1993. However, the situation of public finance sector has greatly improved in recent years, specifically from 1994. The overall fiscal deficit declined from 11.5 % of GDP over the period 1986-1993 to 3.1 % over the period 1994-1999 to reach 1.5% of GDP on average over the period 2000-2013. Over the period 2002-2010, Cote d'Ivoire financed its expenses mainly through internal resources. The external financing was scarce due to the military and political crisis in that period. This situation prompted the then authorities to have a tight control of expenses and tax collection enhancement. These measures led to an improvement in the fiscal balance, although the country was experiencing a political instability.

Mali had a consistent pattern of high fiscal deficits throughout the period 1975-2013. After some improvements over the period 1994-1999, the fiscal deficit increased to 3 % of GDP on average over the period 2000-2013.

Niger has a chronic budget deficit throughout the period 1975-2013. In the 1994, the budget deficit (excluding grants) was about 13% of GDP while the overall fiscal deficit was 7% GDP. Improvements in budgeting and reducing non-essential expenditures led to a better

fiscal performance in the recent years. The overall budget deficit declined from 3.7 % in 2000 to 2.5 % of GDP on average over the period 2000-2013. Tax revenues are very low in Niger due to the large size of the informal sector in the economy (roughly 75% of GDP).

Over the period 1975-2013, Senegal has always recorded a budget deficit except the short period after the devaluation of the CFA Franc (1995-1997). On average, fiscal deficits in Senegal were much higher during the period 2000-2013 compared to relatively lower deficits over the period 1994-1999 (Table 1).

As for Togo, the public finances have been in a fragile situation for long due to the low level of revenue mobilization and the very low level of external financial support resulting from the international isolation that the country had undergone for several years. The low level of the fiscal revenue is mainly due to the high rate of tax fraud, tax and customs exemptions and the lack of human and technical resources for efficient revenue mobilization (IMF Country Report, n°9/165). However, the budget deficit of Togo has declined significantly over the last decade (Table 1).

All the countries of WAEMU area have recorded persistent budget deficits throughout the period 1975-2013. Grants play an important role in reducing budget deficits in the WAEMU zone. Apart from Cote d'Ivoire, Niger and Togo which have made outstanding efforts in reducing their budget deficits, the rest experienced deterioration in their fiscal deficits over the period 2000-2013 compared to its levels over the period 1994-1999 (Table 1).

Concerning trade and current accounts, all WAEMU countries experienced chronic deficits over the period 1975-2013 with the exception of Cote d'Ivoire, which has experienced regularly trade surplus and low level of current account deficit since the devaluation of the CFA franc in 1994. This is due to its wider range of exports including cocoa, coffee, petroleum products and wood while the other countries are heavily dependent on exports of agricultural products such as livestock, fish, cotton, groundnuts and uranium and imports consist of equipments and intermediate goods. Most of WAEMU countries have recorded a widening current account deficit (over 5% of GDP) over the period 2000-2013 compared to the average level over the period 1994-1999. The current account balance of Cote d'Ivoire is deteriorating since 2012 due to the import of equipments for reconstruction and the jumpstarting of the economy after the 2010 political crisis. This situation can be a potential threat for the whole Union since the good performance of Cote d'Ivoire in recent years in terms of external deficit reduction helps to mitigate the overall chronic external deficit (the current account deficit of Cote d'Ivoire has declined from 13.8% of GDP in 1990 to 1.2% in 1999). On average, throughout the past decade, the current account deficit of the whole Union was 5.8 % of GDP.

DATA AND EMPIRICAL METHODOLOGY

Data

Regarding the data, we constructed a balanced panel of annual data running from 1975 to 2013 including all the WAEMU countries except Guinea Bissau. The selection of countries was dictated by the requirement of having continuous data records over the period 1975-2013. Guinea Bissau has been removed from the sample for reasons relating to the availability and reliability of data. The raw data are sourced from the World Bank's database (World Development Indicators, 2014), the database of BCEAO (Central Bank of West African States), the Bank of France, the annual reports of the Franc zone and World Economic outlook (WEO) database.

Concerning the choice of variables used for the empirical study, it is worth noting that the selection of only two variables such as, the fiscal deficit and the external deficit like many previous empirical studies may bias the analysis (Hakro , 2009). In order to keep away from such possible distortions in the analysis, we add to our main variables namely, overall government budget deficit (*bd*) and overall current account deficit (*ca*), other variables such as political instability(*pinst*) and the terms of trade(*tot*)which are likely to influence the budget deficit and the external deficit. Exports of WAEMU countries consist mainly of raw materials; the major part of their income is from export earnings that are highly sensitive to price fluctuations on international markets. Thus, taking into account the terms of trade is important in the analysis of the links between fiscal and external deficits in such an area. Political instability is a persistent feature of most of the WAEMU countries. Political instability has a negative impact on the flow of foreign financial fund such as grants which are important source of income for WAEMU countries. This variable may therefore affect the macroeconomic dynamics that governs fiscal and external balances in these countries. We included also variables such as imports (*impt*); WAEMU countries are heavy importers of goods and services. Almost all of them are characterized by inefficient export sector and high level of imports. Therefore, if the budget balance affects the current account balance, it can be through imports (transmission mechanism). Of course, additional factors can also be relevant for the developments of the current account balances. However, we are essentially interested in focusing on the relationship between the budgetary and current account balances. In this study, we used the overall fiscal balance (including grants). This choice is motivated by the importance of aid in financing government spending in low-income countries. We also used the current account balance (including grants). In addition, we used budget and current account deficits (excluding grants) to see the effect of aid on the relationship between these two variables.

In the literature, the definition of political instability can be divided into two groups: one with a focus on government changes and one with a focus on social unrest. The first category is not relevant for WAEMU area, since in most of these countries government stay on power for long period. In addition, government change is not always a result of political instability; it can be a result of democratic system. Using government -focused measurement of political instability may overestimate or underestimate the political instability effect. Against this drawback, I believe that the social unrest- focused definition of political instability is the most suitable for these countries. Social unrest (politically motivated death and assassination, mass violence, anti-government protests, riots, internal conflict) is a common characteristic of these countries. Therefore, I used the average of the political terror scale (assessment of political violence and terror) provided by Amnesty International and the US State Department Country Reports. I used also the International Country Risk Guide (ICRG) index (internal conflict)^v.

Empirical Methodology

To conduct a thorough analysis of the relationship between budget and current account deficits in WAEMU countries, we relied on Panel Vector autoregressive (Panel VAR) approach. The panel VAR specification can benefit from both the advantage of the VAR approach dealing with endogeneity and the panel data techniques in improving estimation efficiency. The impulse response functions and variance decomposition obtained from the panel VAR estimation are very suitable to examine how macroeconomic imbalances interact.

^v I used the average of the political terror scale measured by US State Department and the one measured by Amnesty International because for a given year, one country can obtain different score from the above-mentioned institutions. Due to data constraints, we estimated our model over the period 1984-2013 when the ICRG index is used as political instability variable.

The reduced form of panel VAR model can be defined as follows:

$$Z_{it} = \alpha_i + \Gamma(L)Z_{it} + \varepsilon_{it} \quad (6)$$

Where i ($i=1, \dots, N$) denotes the countries and t ($t=1, \dots, T$) stands for time. Z_{it} is a vector of endogenous variables, $\Gamma(L)$ is the polynomial matrix in the lag operator L with the following functional form :

$$\Gamma(L) = \Gamma_1 L_1 + \Gamma_2 L_2 + \dots + \Gamma_p L_p \quad (7)$$

α_i is the vector of country-fixed effects and ε_{it} is the vector of errors.

In applying the panel procedure, one may face a problem of heterogeneity. However, we are not the only ones looking at the “twin deficits phenomenon” by using a panel VAR approach. Recent studies such as Beetsma et al.(2008) and Abbas *et al.*(2011) have made use of panel VAR techniques to test empirically the “twin deficits hypothesis”. Countries of our sample share many similarities, but to deal with possible heterogeneity, we introduced the fixed effects (α_i) to account for unobserved country-specific heterogeneity (equation 6). To impose further homogeneity restriction, we secondly split our sample into two groups: one with Cote d’Ivoire (the leading economy in WAEMU area) and one without Cote d’Ivoire to check the robustness of our results.

The estimators of the fixed effects model in an autoregressive panel model are biased due to the fact that the fixed effects are correlated with the regressors through the presence of the lags of the dependent variable (see Nickell, 1981).

We avoided this problem by using the forward mean-differencing procedure also referred to as the *Helmert procedure*. This transformation preserves orthogonality between transformed variables and lagged regressors, it preserves homoscedasticity and does not induce an autocorrelation. Thus, we estimated our panel VAR model by GMM (Generalized Method of Moments) system procedure using lagged regressors as instruments (see Arellano and Bover, 1995; Love and Zicchino, 2006; Mignon and Gnimassoun, 2013).

In order to investigate the interaction between budget and current account deficits, we estimate the following first system of variables:

$$\text{Model 1: } Z_{it} = (pinst_{it}, tot_{it}, bdeg_{it}, caeg_{it})',$$

Where $pinst$ is the political instability, tot is the terms of trade, $bdeg$ is the budget balance (excluding grants) and $caeg$ is the current account balance (excluding grants).

In order to examine the effect of grant on the relationship between budget and current account deficits, we consider this second model given by the following system of variables:

$$\text{Model 2: } Z_{it} = (pinst_{it}, tot_{it}, bdis_{it}, ca_{it})',$$

Where $bdis$ is the budget balance (including grants), ca is the current account balance (including grants).

Alternatively we also evaluate the effect of grant on the relationship between budget and current deficits by including grant as a separate variable in the following system of variables:

Model 3 : $Z_{it} = (pinst_{it}, tot_{it}, grt_{it}, bdeg_{it}, caeg_{it})'$

grt stands for grant as a ratio to GDP. The other variables are the same in the model 1.

In order to trace a possible transmission mechanism^{vi} by which budget and current account deficits influence each other, we estimate the following system of variables:

Model 4: $Z_{it} = (pinst_{it}, tot_{it}, bdeg_{it}, impt_{it}, caeg_{it})'$, Where, *impt* is import as a share of GDP.

WAEMU countries are heavy importers of good and service. Almost all of them are characterized by inefficient export sector and high level of imports. Therefore we suspect “imports” to be the important mean by which budget deficit can affect current account deficit.

Once the coefficients of the Panel VAR are estimated, we compute the impulse-responses functions and the variance decompositions. Impulse-response functions describe the response of one variable in the system to a shock on another variable in the system, while holding all other shocks at zero. Variance decompositions measure the contributions of each source of shock to the (forecast error) variance of each variable in the system at a given forecast horizon.

We use Cholesky decomposition to compute the impulse-responses functions. The causal ordering in our study systems from both economic theory and the orthogonality of structural innovations. In our models, the first variable in the ordering (political instability) is assumed to impact all the variables but none of the other variables is assumed to impact the political instability. In other words, the first variable is assumed to have contemporaneous effect on all the other variables but none of the other variables is assumed to have contemporaneous effect on the first. The second variable in the ordering is assumed to have contemporaneous effect on all the other variables except the first. The ordering of the rest of the variables in our models has been determined in similar way^{vii}.

RESULTS AND DISCUSSIONS

As we mentioned earlier, our panel VAR model was estimated by GMM system. However, a few precautions were necessary before the regression. The GMM estimators obtained with a large number of instruments are not consistent in the samples with relatively small size. Thus, as suggested by usual information criteria, VAR (1) has been retained for the estimation. Like many studies, before estimating our models, we firstly performed the panel unit root test on the variables used in this study. From table 2, we can conclude that our variables are stationary in level.

The results of the estimation of our models are presented in the form of impulse responses functions. We are most interested in the impulse responses functions representing the response of the current account balance to a shock on the budget balance, and vice-versa. The confidence intervals for impulse responses functions were calculated by Monte Carlo simulations with 1000 repetitions

^{vi} For the transmission mechanism analysis, we didn't include interest rate and exchange rate because they are not relevant in fixed exchange regime compared to floating exchange regime.

^{vii} For the robustness of our analysis, we change this ordering, but it does not significantly impact on our results.

Table 2. Results of the unit root tests on the variables

| LEVEL | LLC | IPS | MW(ADF) |
|--|---------------|---------------|---------------|
| <i>Model Specification: constant and trend</i> | | | |
| ca | -3.51 (0.000) | -3.245(0.000) | 44.31(0.000) |
| bd | -4.12(0.000) | -3.268(0.000) | 35.94(0.001) |
| caeg | -2.68(0.003) | -3.13(0.001) | 56.28 (0.000) |
| bdeg | -3.93(0.000) | -3.26(0.000) | 53.01(0.000) |
| tot | -2.06(0.019) | -2.82(0.019) | 35.60(0.001) |
| grt | -3.323(0.000) | -3.49(0.000) | 72.77(0.000) |
| pinst | -1.94(0.025) | -2.95(0.007) | 41.24(0.000) |
| impt | -2.49(0.006) | -2.63(0.073) | 53.89(0.000) |

Source : Author's computation

Notes: numbers in parentheses are the p-values; others are the t-statistics. If the p-values are less than 1%, 5% or 10%,

The null hypothesis of unit roots was rejected. LLC, IPS, and MW stand respectively for the Levin *et al.* (2002), Im *et al.* (1997), Maddala and Wu (1999) unit root tests. All the tests posit the null hypothesis of unit root.

The impulse response functions in Figure 1 show a positive and significant response of the current account balance (*caeg*) to budget deficit (*bdeg*) shocks. In other words, an improvement (deterioration) in the fiscal balance (excluding grants) improves (deteriorates) the current account balance (excluding grants).

Another interesting finding from the impulse-response functions is the positive and significant effects of a shock to the current account balance on the budget deficit. These results indicate that an increase in the current account deficit leads to a worsening in the budget deficit. This results show that a merely reduction in the budget deficit is not sufficient in the perspective of turning down the current account deficit in WAEMU area; since the reverse relationship is quite robust. If true, this finding casts serious doubt on the validity of single-equation approach to empirically test the twin deficits hypothesis. Consequently, we may argue that treating the budgetary variable as fully exogenous in the analysis of twin deficit hypothesis can be highly misleading for policy purposes. To sum up, budget deficit (surplus) leads to current account deficit (improvement) and the current account deficit (improvement) leads to budget deficit (improvement) in WAEMU countries. As these countries rely heavily on the exports of commodities (trade), they are more likely to have their domestic developments dictated by the foreign balance to a certain extent (see Kouassi *et al.*, 2004). Regarding the other variables used in the model, the impulse response functions show that political instability (*Pinst*)^{viii} has a negative effect on the fiscal and external balances (excluding grants). Political instability increases the budget and current account

^{viii} The two measures of political instability used in the study provide similar results.

deficits. Political instability slows economic activities. Consequently, tax revenues decrease for a given level of expenditures. Since budget deficits impact on current account balance, when the political instability deteriorates the budget balance, it leads also to a deterioration in the current account balance. A shock on the terms of trade (*tot*) has a negative effect on the budget and the current account balances (excluding grants). Deterioration in the terms of trade leads to a deterioration in the budget and current account balances. This finding is in line with the situation of the WAEMU countries in the 1980s. In that period, WAEMU countries experienced high deterioration in their terms of trade along with high deterioration in their budget and current account deficits. This result can be explained by the specificity of the economies of WAEMU countries. These economies rely heavily on commodities exports; it is a major source of income. Thus, a decrease in the revenue due to a negative exogenous shock on prices has a negative impact on the current account, growth and budget balance.

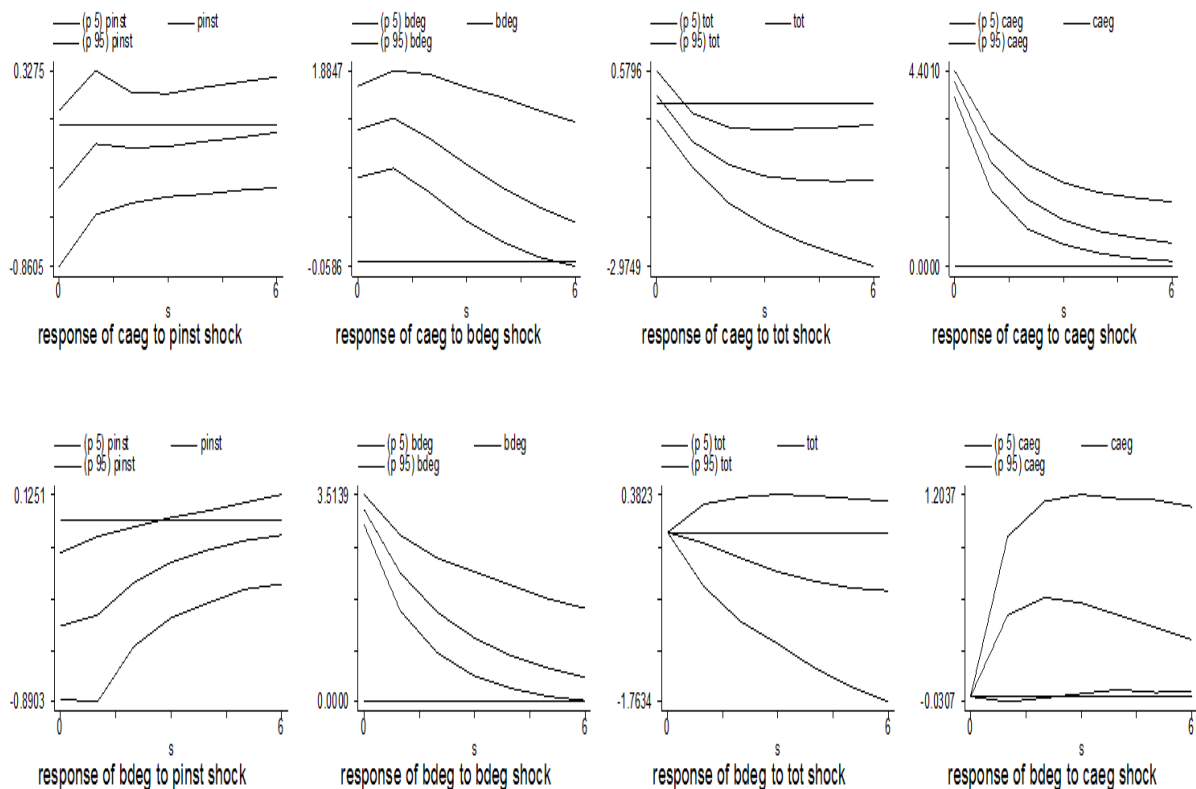


Figure 1: Impulse response functions -Model1: Budget and Current account balances (excluding grants)

Errors are 5% on each side generated by Monte-Carlo with 1000 reps

Extreme curves represent the confidence intervals at 5% threshold.

Source: Author's computation with software STATA 11

Figure 2 displays the impulse response functions of Model 2. It shows the response of the current account balance (including grants) to a shock on the budget balance (including grants). As said previously, the aim here is to assess the role of aid (grants) in the co-movement of the budget and current account deficits. An analysis of Figure 2 shows that the current account balance (including grants) responds positively and significantly to the budget deficit (including grants); and vice-versa. This result is in line with the previous one (model 1). However, in term of the magnitude of the response, we notice that, the association of budget and current account deficits (including grants) appears stronger than the one obtained when we used budget and current account deficits (excluding grants). This difference in term of the magnitude of the response could be attributed to aid. The two variables seem to be

correlated with the variations in grants. To test the robustness of this result, we included grants as a variable in our model and we evaluated the variation in the fiscal and current account balances. The results are shown in Figure 3.

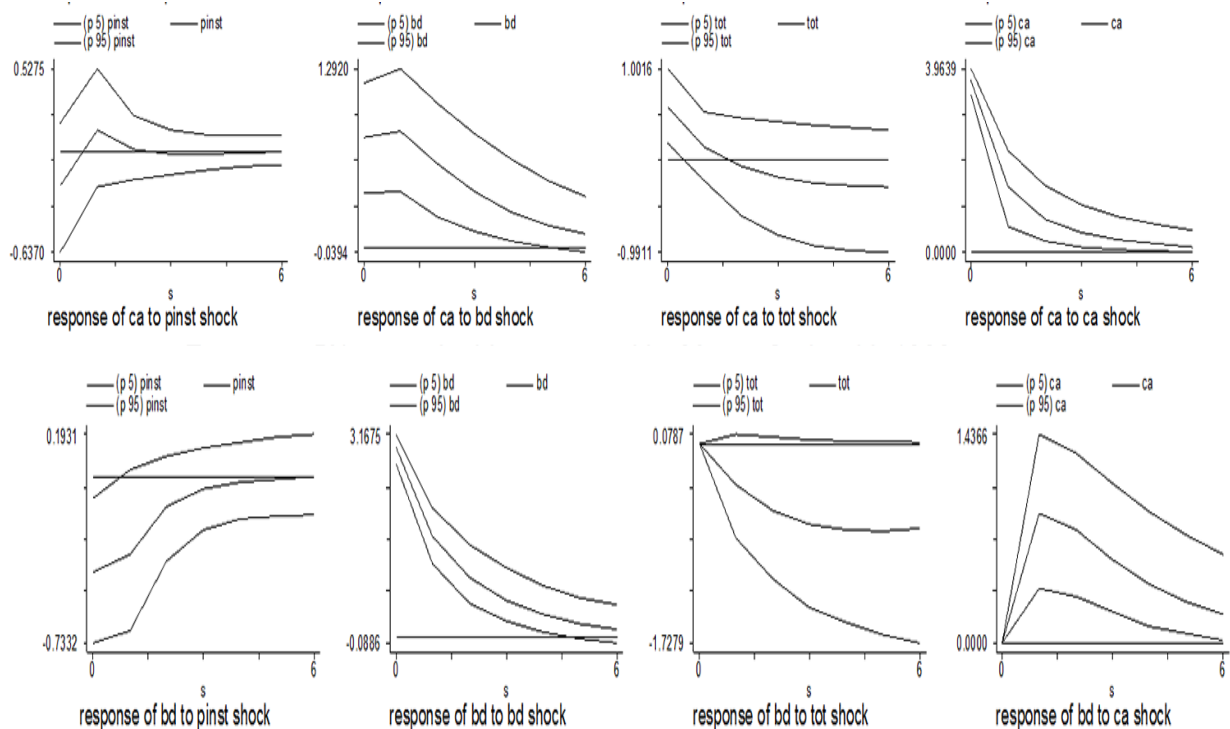


Figure 2: Impulse response functions -Model 2: Budget and current account balance (including grants)

Errors are 5% on each side generated by Monte-Carlo with 1000 reps

Extreme curves represent the confidence intervals at 5% threshold

Source: Author's computation with software STATA 11

Figure 3 displays the impulse response functions of Model 3. It shows the responses of budget and current account deficits to variations in grant received by government. Budget and current account deficits respond negatively and significantly to a shock on grants (aid). A reduction (increase) in aid increases (reduces) budget and current account deficits. Changes in aid cause correlated movements in the budget and current account deficits.

These co-movements have nothing to do with the twin deficits hypothesis which is about the effect of changes in budget deficit on the current account balance. This study shows that “the twin deficit hypothesis” is not always the “driving spirit” behind a simultaneous upsurge of budget and current deficits. For a better understanding of the interaction between the two deficits in low-income countries where aid is an important source of income, it is important to use budget and current account deficits (excluding grants). Our results indicate that using budget and current account deficits (including grants) overestimates the relationship between the two deficits and therefore may be misleading for economic policy recommendations. The assessment of the sensitivity of our results to alternative ordering of the variables in the models show that the results are robust since the change of the ordering in the VAR has no significant effect on the results.

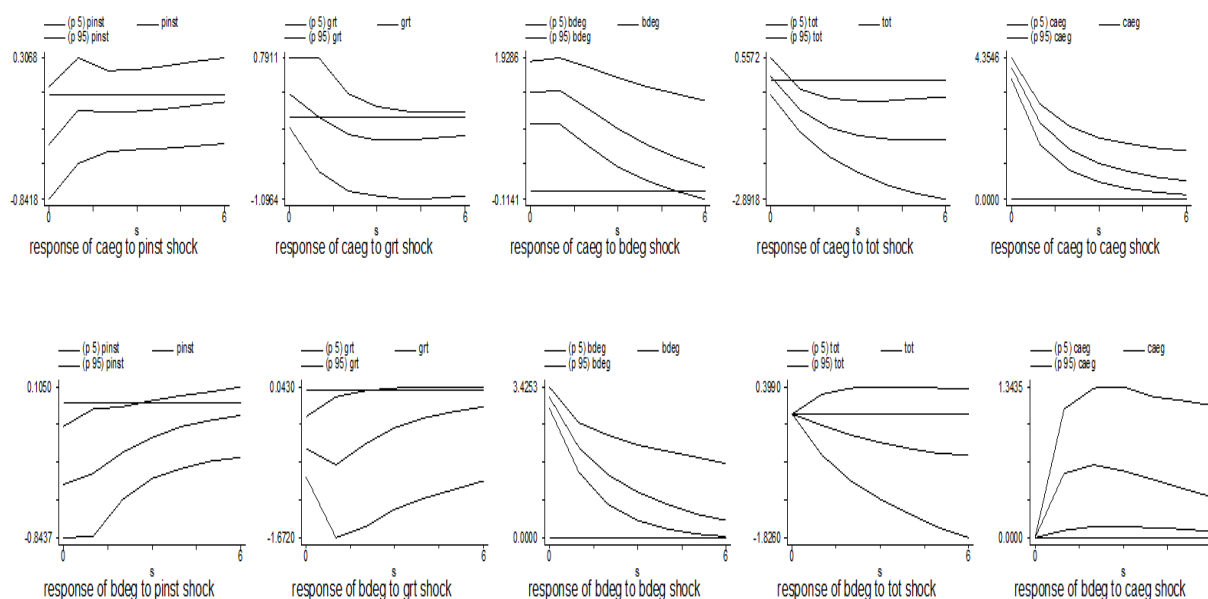


Figure 3: Impulse response functions -Model 3

Extreme curves represent the confidence intervals at 5% threshold

Source: Author's computation with software STATA 11

Variance Decomposition

Variance decompositions allow us to know the percentage of variation in a variable explained by another variable in the system. In the variance decompositions, the relationship among the variables may be evaluated in terms of degree of causality. Thus, it is more appropriate to use it to trace out a possible transmission mechanism by which budget and current account deficits influence each other in our model 4^{ix}. The results of the Variance decomposition accumulated over 5 years horizons are reported in Table 3.

The variance decomposition analysis from Model 1 shows that budget deficit (excluding grants) explains 11.68% of the fluctuations in the current account balance (excluding grants). Although, there is positive relationship between budget and current account deficits, we may conclude that the relation is weaker than expected. However compared to the contributions of the other variables to changes in the external deficit, it is worth noting that the budget deficit has the largest contribution. The current account balance is sensitive to shocks affecting the budget balance in the WAEMU countries. This finding is consistent with the one obtained from the impulse–response functions. Another interesting finding is that the external deficit explains 15.52 % of the fluctuations of the fiscal balance. Regarding the other variables, we noticed that the political instability explains 7% of the variation in the budget balance and 10.58% of the fluctuations in the current account balance. The terms of trade explain respectively 4.88% and 5.31% of the fluctuations in the budget and current account balances. We may conclude that a shock to the external deficit has a greater impact on the budget deficit than that of a shock to the budget deficit on the external deficit. This result is consistent with that provided by the impulse response functions. Variance decomposition from model 2 shows that the overall budget deficit explains approximately 16% of the fluctuations in the overall current account deficit. The current account balance explains also approximately 22% of the variations in the budget balance. Strong correlation between the two deficits is obtained when we take into account aid. Like in model 1 (without grants),

^{ix}Since we are interesting in the existence of transmission mechanism in model 4, we focused only on the results of the variance decompositions.

Political instability and the terms of trade also explain variations in the current account balance, but the budget deficit has the largest contribution. This result is in line with the one provided by the impulse response functions.

Overall our results show that there is a positive relationship between budget and current account balance in WAEMU area (Budget deficits impact on the current account deficits and vice-versa). As mentioned above, the results provided by the variance decompositions, show that the relationship between the two deficits is weaker than expected. Therefore, it may be useful to compare our findings to some of those in the literature. We can compare our results with the study by Zengin (2000). Using a VAR model he found that the budget balance explains 11% of the fluctuations in the current account balance and the current account balance explains 2% of the variations in the budget balance in the case of Turkey. Barumshah et al. (2004) found that the budget deficits explain 8 to 11% of the variations in the current account deficits and the current account balance explains 4 to 24% of the fluctuations in the budget balance in the case of Malaysia. There are no great differences between these findings and ones obtained in this paper. All these studies concluded in favor of the twin deficits phenomenon.

Finally, in Model 4, we included imports a separate variable, the variance decomposition analysis show that the budget deficits explain approximately 44% of the fluctuations in the imports. This result was expected since WAEMU countries are heavy importers of goods and services. Almost all of them are characterized by inefficient export sector and high level of imports. Approximately 22% of the fluctuations in the current account balance are explained by imports. Budget deficits also explain approximately 14% of the variation in the current account balance. Finally, as in the model 1, the results from model 4 show also that current account balances explain 20.5% of the variation in the budget balance. Economically speaking, we can trace out from our results, two transmission mechanisms through which the budget and current account balances influence each other: one directly from budget deficit to current account deficit; vice versa and indirectly from budget deficit to current account deficit through imports. This result shows also that the Keynesian absorption theory is valid in WAEMU countries. According to this theory, an increase in the budget deficit would induce an increase in domestic absorption and hence import expansion, causing an increasing or worsening in the current account deficit.

We re-estimated all our models by dropping Cote d'Ivoire (the leading economy in the WAEMU zone). The purpose was to show how robust our results are to the exclusion of this country. In the results which are reported here, the nature of the link between budget and current account balances did not change.

Tableau 3 - Variance Decomposition

| Variation in the row variable explained by column variable (in %, 5 years horizons) | | | | | | | | | |
|--|-------|-------|------|-------|------------------------------|-------|-------|-------|-------|
| Model 1 (without grants) | | | | | Model 2 (with grants) | | | | |
| | pinst | bdeg | tot | caeg | | pinst | bd | tot | ca |
| pinst | 82.09 | 7.02 | 0.30 | 10.58 | pinst | 77.48 | 8.56 | 0.37 | 13.58 |
| bdeg | 3.62 | 76.06 | 8.63 | 11.68 | bd | 2.52 | 72.65 | 8.76 | 16.06 |
| tot | 0.11 | 4.88 | 89.6 | 5.31 | tot | 0.12 | 4.08 | 90.38 | 5.40 |
| caeg | 0.66 | 15.52 | 9.70 | 74.10 | ca | 0.34 | 22.27 | 5.26 | 72.12 |

Model 4 (Transmission mechanism analysis)

| | pinst | tot | bdeg | impt | caeg |
|-------|-------|-------|-------|-------|-------|
| pinst | 60.17 | 0.35 | 7.89 | 21.05 | 10.53 |
| tot | 0.87 | 62.47 | 3.22 | 24.83 | 8.60 |
| bdeg | 3.24 | 7.20 | 31.98 | 43.95 | 13.62 |
| impt | 0.56 | 19.36 | 0.23 | 58.09 | 21.75 |
| caeg | 1.34 | 7.76 | 20.52 | 0.42 | 69.95 |

Source: Author's computation

Notes: Numbers in the table are the percentage of variation in the variable in row explained by the variable in column.

CONCLUSION AND POLICY RECOMMENDATIONS

The deficit in the balance of payments remains a permanent threat to developing countries because of the fragility of their economies and their high dependence on international political and economic issues. Thus, proponents of the twin deficits hypothesis advocate reducing the budget deficit to control the external deficit. This hypothesis is one of the most debated macroeconomic topics both in developed and developing countries during the last three decades. This empirical exercise was undertaken with a view to contribute to this debate by examining the relationship between the persistent government and current account deficits of WAEMU countries. To this end, we estimated four (4) variants of panel VAR model over the period 1975-2013. The impulse response functions obtained from the panel VAR model show positive relationship between budget and current account deficits regardless to the model estimated. Overall, budget deficits explain 11 to 16% of the fluctuations in the current account balance, while current account balances also explain 15 to 22% of the variation in the budget balance. The current account balance (excluding grants) responds positively and significantly to the budget deficit (excluding grants) shock. This result is consistent with the “twin deficits hypothesis”. Interestingly, the results show also that the reverse relationship running from external to internal deficits is much stronger in terms of magnitude of the impact. Current account deficit exacerbates the budget deficit and vice versa in WAEMU countries.

However, the link between the two deficits appears stronger when budget and current deficits (including grants) are used in the estimation. The variance decomposition concurs with these findings. These results show that for a better understanding of the interaction between the two deficits in low-income countries where aid is an important source of income, it is important to use budget and current account deficits (excluding grants). Our results indicate that using budget and current account deficits (including grants) may overestimate the relationship between the two deficits and therefore may be misleading for economic policy recommendations.

Budget and current account balances respond negatively and significantly to political instability and terms of trade deterioration. These variables impact on budget and current balances in WAEMU countries.

Regarding the transmission mechanism, there may be several channels by which the budget and current account deficit can influence each other but the one found in this study show that budget deficit affects current account balance through imports.

The results found in this study are very appealing regarding the economic policy that advocates dealing with the problem of current account imbalances by simply relying on budget deficit reduction. This policy is not sufficient in WAEMU countries since the budget deficits impact on the current account and the budget balance is also affected by the current account balance. Political instability and the terms of trade also affect budget and current account balances.

Our findings suggest that fiscal discipline complemented with adequate exports promotion policy, imports reduction through strong support to domestic production, particularly in food items such as rice that are heavily imported in the WAEMU area. The fiscal discipline must be based on: (i) an effective control of public spending by reducing non-productive expenditure. A large portion of government revenue must be devoted to investments; (ii) introduction of fiscal adjustment measures and enhancement of the tax collection system. These fiscal consolidations efforts must be accompanied by:

- An appropriate policy for exports promotion and diversification in order to mitigate the terms of trade shock.
- Structural reforms to increase productivity and competitiveness.
- Import reduction by increasing domestic production and encouraging population to consume local products.
- Strong measures to minimize political instability through strong institutions, since most of development partners suspend their assistance (aid) when there is a political instability in the assisted country, and foreign aid is very important for WAEMU countries to mitigate their budget and current account deficits.

We are aware that the relation between budget and current account deficit is complex and inconclusive. It may depend on the dynamics of the economy and some various macroeconomic developments. To that end, forthcoming research on this issue should focus on expanding these findings by conducting per country analysis. It will help to deepen our understanding of twin deficits phenomenon in WAEMU countries since the effect of budget deficit on current account balance found from the cross-country perspective in this paper appears to be weaker than expected.

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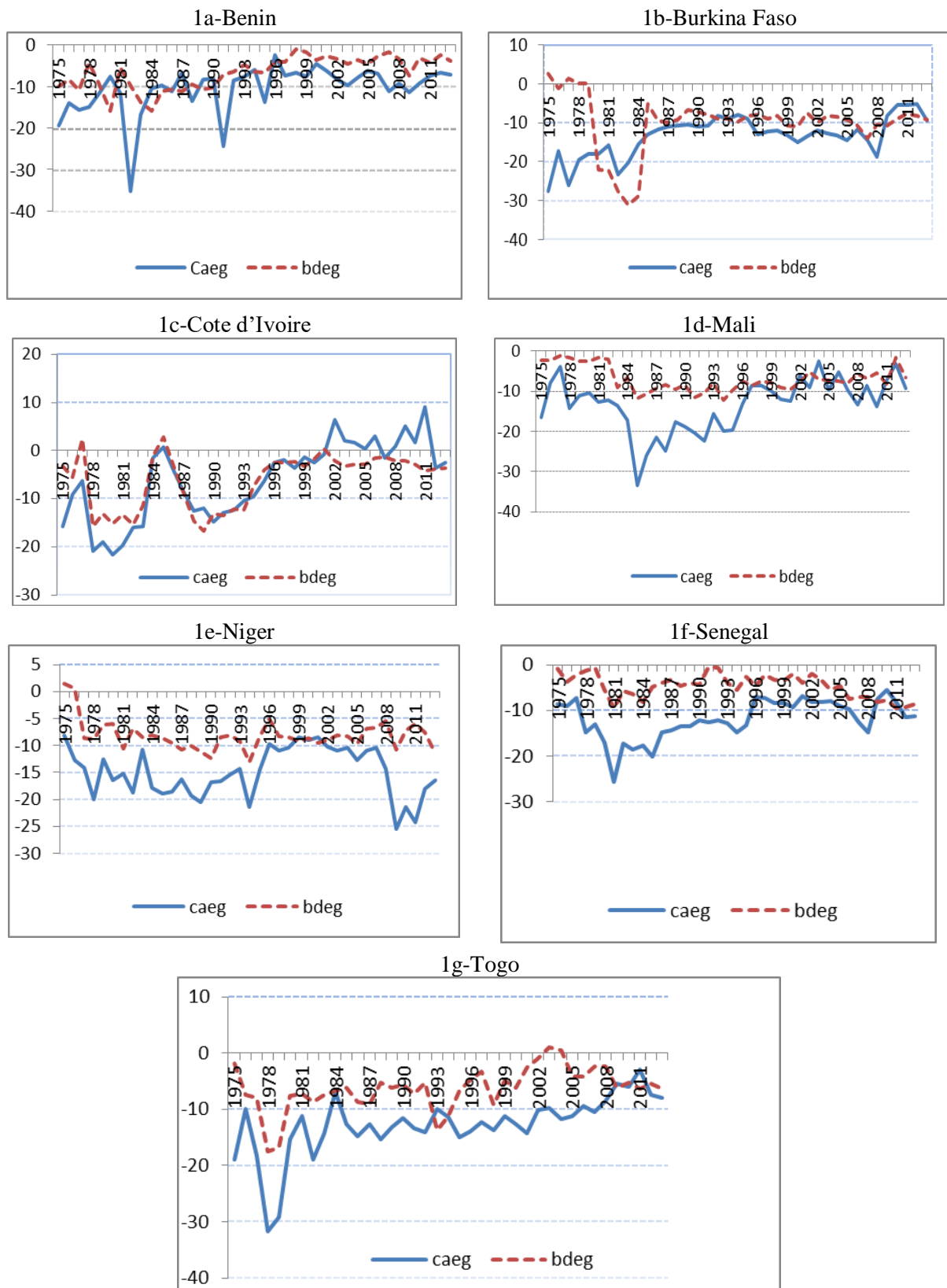
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**Appendix 1: Budget and Current account balances (excluding grants) in WAEMU countries:
1975-2013 (% of GDP)**



Source: World Development Indicators (WDI); BCEAO (Central Bank of West African States); Author's computation.

caeg: current account balance (excluding grants), bdeg: budget balance (excluding grants)

**Appendix 2: Budget and current account balances in WAEMU countries:
Summary statistics (1975-2013)**

| Overall Current Account Balance (% of GDP) | | | | | | | |
|--|--------|---------|---------------|--------|--------|---------|--------|
| | Benin | Burkina | Côte d'Ivoire | Mali | Niger | Senegal | Togo |
| Mean | -6.54 | -5.36 | -4.19 | -8.84 | -7.97 | -7.65 | -8.08 |
| Max | 0.70 | 3.79 | 7.16 | 0.51 | 1.14 | -2.88 | 3.64 |
| Min | -29.75 | -21.23 | -17.95 | -15.96 | -24.50 | -14.52 | -26.36 |
| Std. Dev | 4.85 | 5.07 | 6.73 | 3.19 | 5.19 | 2.87 | 5.08 |
| Obs | 39 | 39 | 39 | 39 | 39 | 39 | 39 |

| Overall Budget Balance (% of GDP) | | | | | | | |
|-----------------------------------|--------|---------|---------------|-------|--------|---------|--------|
| | Benin | Burkina | Côte d'Ivoire | Mali | Niger | Senegal | Togo |
| Mean | -2.72 | -3.14 | -5.64 | -2.90 | -3.63 | -2.84 | -4.48 |
| Max | 1.98 | 10.29 | 2.87 | 0.33 | 1.58 | 2.07 | 1.65 |
| Min | -11.35 | -13.54 | -16.65 | -6.74 | -10.64 | -8.52 | -14.52 |
| Std. Dev | 3.21 | 3.95 | 5.92 | 1.45 | 2.50 | 2.51 | 3.74 |
| Obs | 39 | 39 | 39 | 39 | 39 | 39 | 39 |

| Grant (% of GDP) | | | | | | | |
|------------------|-------|---------|---------------|-------|-------|---------|------|
| | Benin | Burkina | Côte d'Ivoire | Mali | Niger | Senegal | Togo |
| Mean | 4.16 | 6.68 | 0.48 | 4.89 | 4.56 | 1.77 | 2.00 |
| Max | 9.70 | 18.42 | 3.02 | 38.87 | 8.67 | 6.66 | 5.3 |
| Min | 1.02 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Std. Dev | 2.11 | 4.62 | 0.61 | 6.03 | 2.18 | 1.27 | 1.46 |
| Obs | 39 | 39 | 39 | 39 | 39 | 39 | 39 |

Source: Author's computation