EFFECT OF GOVERNMENT FISCAL DEFICITS ON CURRENT ACCOUNT BALANCE: THE CASE OF TWIN DEFICITS HYPOTHESIS IN NIGERIA, 1970-2013

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Abstract

This study examined effects government fiscal deficits have on Current Account Balance which has balance of payments as its proxy. In macroeconomic systems, variables are known to be interlinked so that some have countervailing effects on others. For this reason, interest rate and exchange rate are incorporated into the study. Secondary data are collected from CBN Statistical Bulletin. Hypotheses are tested using Ordinary Least Squares (OLS) method. The results of the study show that government fiscal deficits do not affect current account balance indicating a possible absence of the existence of twin-deficits hypothesis in Nigeria. It also reported that exchange rate has significant positive effect on current account balance while interest rate has negative significant effect on current account balance. The study recommends that the government should curtail its annual persistent fiscal deficits. The same should be done to control trade deficits, exchange rate and interest rate. This is necessary because even if they are not linked to fiscal deficits, the economy is heavily import dependent that tends to bloat trade deficits.

Keywords: Twin Deficits Hypothesis, Current Account Balance, Ordinary Least Squares, Keynesian Model, Income Windfall and Exchange Rate.

Section (I) Background of study

Every fiscal year the government prepares its annual budget for the year. In Nigeria from independence in 1960 government operated fiscal year running from April to March of the following year. But some four decades ago, fiscal year was changed to correspond with conventional year, January to December. A budget is balanced when planned expenditure equals planned revenue. We have surplus budget when planned revenue is higher than planned expenditure. On the other hand, it is deficits when planned expenditure exceeds planned revenue (Dalyop, 2010). According to Cacy (1975), Surplus budget can be referred to as case of positive deficit while deficit budget can be called negative deficit.

In Nigeria, huge revenues have been obtained from taxation and oil and gas. However, recent plummeting of oil prices in the international oil market has put excessive pressure on government finances. Even with oil and gas massive revenues, the government has engaged in persistent fiscal deficits. Ezeabasili, Ioraver and Herbert (2012) report that fiscal deficits have existed since 1970, with exception of 1971, 1974, 1975, 1995 and 1996 which recorded surplus. The table in Appendix confirms this.

The government revenue profile has been bedevilled by poor tax collection system worsened by widespread tax evasion, tax avoidance and inefficient tax administration system. There is also low income system for a large segment of the population resulting in low income tax liability. In recent years, oil theft and falling oil prices have worsened the situation. Thus, the

government has fallen back on fiscal deficits as a major way of financing its budget. Part of the results of deficits of government is the effect on external trade balance. Before SAP was introduced in 1986, heavy trade deficits mounted as part of unpaid trade bills. This gave rise to fears as to whether twin deficits hypothesis operated in Nigeria.

The twin deficits hypothesis emerged in the 1980s during the Presidency of Ronald Reagan in the United States of America. Since then, macroeconomists, policy makers and researchers investigated the enormous and persistent fiscal deficits that have existed side by side with large deficits on current account (external trade balance) especially in developing countries. The existence of the two types of deficits at the same time has inspired macroeconomists and researchers to propose a direct link between government fiscal deficits and current account balance. Researchers, seeing the two as existing simultaneously and in almost the same magnitude named the phenomenon as 'twin deficits' hypothesis. The first phase of the incident in the US was marked by appreciation of the Dollar and unusual shift in current account and budget deficit (Lau and Baharumshah, 2006). They observe that the close link between the two types of deficits is not peculiar to the US but other countries of Europe which faced similar situation. Developing countries were worst hit as they faced accumulation of huge fiscal deficits as well as mounting trade deficits. Nigeria is deeply involved in this malaise. The bizarre situation brought in the World Bank and International Monetary Fund (IMF) in the 1980's to foist strangulating structural adjustment conditonalities in 1986.

It is believed that reduction of fiscal deficits will reduce current account balance deficits. This belief assumes the existence of twin deficits. Put differently, it accepts that internal fiscal balance may most likely, produce external imbalance. According to Suchismita and Sudipta (2011), the two deficits may have completely different sets of triggers. But they often may arise because of expenditure and taxation policy measures that worsen in times of external trade crisis. The external or current account deficit measures the net flow of trade and investment income which depends mostly on global income. The external deficit is worsened when the external environment is weak and when the domestic economy is expanding by deficits to finance imports

This study is motivated by the fact that fiscal deficits and trade deficits still exist and generate controversies among policymakers, macroeconomists and other researchers. According to Omoniyi, Oseni and Onakoya (2012), the relationship between fiscal deficit and trade deficit represents a widely discussed issue in developed and developing countries. In Nigeria, despite the introduction of SAP, the spectre has remained. Fleegler (2006) observes that economic literature remains in conflict regarding the existence of twin deficits hypothesis with most empirical studies dealing with developed countries. There has been paucity of studies on developing countries. This study is, therefore, aimed at investigating how far twin deficits hypothesis operates in Nigeria. Some studies add that fiscal deficits and current account deficits have inter-linkages with other macroeconomic variables such as exchange rate and interest rate (Suchismita and Sudipta, 2011). For this reason, part of the objectives includes exchange rate and interest rate as part of the investigation. Specifically, this study wants to:

i. Investigate the effect of government fiscal deficits on trade deficits in Nigeria;

ii. Explore effect of government fiscal deficit on exchange rate in Nigeria; and

iii. Investigate the effect of fiscal deficit on interest rate in Nigeria.

Following from the objectives, three Null hypotheses are proposed:

H_{01}-Government fiscal deficits have no positive and significant effect on current account balance, proxied by balance of payments in Nigeria.

H_{02}-Government fiscal deficits do not have positive and significant effect on exchange rate in Nigeria.

H_{03}- Government fiscal deficits do not have positive and significant effect on interest rate in Nigeria.

The scope of the study is from 1970 – 2013. Fiscal deficits of Federal Government are used because of the availability of data. The Limitation of the study is that there is paucity of empirical studies of twin deficits in Nigeria which has made empirical review of Nigeria not elaborate. The study has however reviewed other developing countries. Sub-national governments (States and Local governments) are not included because data for them are either incomplete or unavailable (Islam and Wetzel, 1991).

The paper is arranged in sections. Section (I) are the points discussed this far. Section (II) reviews related literature. Section (III) deals with methodology of study and data presentation. Section (IV) analyzes the data with interpretation. Section (V) concludes the work with recommendations.

Section (II) Review of related literature

Cavallo (2005) states that fiscal deficit implies a decrease in national saving which is the sum of private saving plus government fiscal balance. When national saving falls below domestic investment, the current account is in deficit. He adds that budget deficits actually have a positive effect on the current account balance. Furthermore, it is believed that twin deficits exist when a government increases its fiscal deficit, domestic residents use some of the income windfall to boost consumption, causing total national (private and public) savings to decline. This decline in savings requires the country often to borrow from abroad. This results in wider fiscal deficit which is always accompanied by a wider current account deficit. He however adds that many empirical studies have failed to establish a strong relationship between fiscal and current account deficits. In their own study of 22 developing countries, Nickel and Vansteenkiste (2008) argue that although empirical literature is inconclusive on the relationship between fiscal deficits and current account deficit (twin deficits), many economists suggest that wider fiscal deficit should be accompanied by wider current account deficits.

Fleegler (2006) in his study observes that apart from conflicting views on true effects of fiscal deficit on the economy, there is also growing conflict on fiscal and trade deficit. According to him, persistent trade deficits lead to fewer jobs. He observes that most extant studies concentrate on developed countries to the neglect of developing countries. Fleegler (2006), using a data set of one developed country, two middle-market economies and two developing economies, finds a degree of statistical correlation between trade deficits and fiscal deficits for each of the countries in the sample. His study also provides some evidence that there are multiple factors influencing the susceptibility of an economy to the twin deficits dilemma. The findings also indicate that a nation's development status and the composition of its imports and exports may all influence the persistence of fiscal deficits and current account deficit. He concludes that twin deficit phenomenon tend to be time specific and is affected by multiple factors. Lau and Baharumshah (2006), observed that unsustainable fiscal deficit of the early 1980s had widened the current account deficit especially for developing countries. In their study of nine South East Asian countries (SEACEN – Malaysia, Singapore, Thailand, Indonesia, South Korea, Myanmar, Nepal, Srilanka and the Philippines) they noted that; the importance of variables such as interest rate and exchange rate in the budget – current account deficits have been ignored and that there

is no consensus on the casual relationship between the two deficits. In a similar vein, Kumhof and Laxon (2012), found that the link between government fiscal deficits and current account deficits is weak or even non-existent. Lau and Baharumshah (2006) further observe that a worsening budget deficit stimulates an increase in current account deficit. They also noted that the two deficits are mutually dependent, and that causality runs from fiscal deficit to current account deficit or from current account deficit to fiscal deficits. He calls this account targeting or reverse causation. Finally, they reported bidirectional causality between the two deficits which suggests that internal deficit in SEACEN countries are not the main cause of the external deficit. It is also seen that the reverse causation running from external to internal deficits is strong and significant. This finding appears to conflict with conventional view that emphasizes that causality runs from budget deficit to current account deficit and not vice verse.

Furthermore, in a study of Argentina's economy, Brian (2012) used Vector Auto Regression (VAR) and causality models to study twin deficit hypothesis in Argentina for the period 1976-2010. Before his tests, he observed some conclusions in the literature that it is difficult to confirm or disprove the Twin Deficits hypothesis. Also, each country's case has to be on a case by case basis taking into account how the policies enacted in each country could affect the country. He posits that there is significant inflation in Argentina and that fiscal policy in Argentina is poorly managed. The result of his test is that there is a causal relationship between budget deficit and trade deficit in Argentina. He did not however establish the direction of causality denoting that one variable cannot be used as a predictor for the other.

On their part, Asrafuzzanman, Amit and Gupta (2013) carried out a study to examine empirically the conventional view that budget deficit significantly affect trade deficit in Bangladesh. The study covers the period 1972-2012 and employs VAR and Engle-Granger causality techniques. The study reports a short-run bidirectional causality between budget deficit and trade deficit but does not establish any long-run dynamic relationship between the two variables. The causality test justifies the view that fiscal deficit significantly contribute to a deterioration of the trade deficit of Bangladesh.

Suchismita and Sudipta's (2011) study is on India's twin deficits: some fresh evidence and covers the period 1999-2011. The study, although on the relationship between fiscal deficit and current account deficit, incorporates the effects of deficits on the transmission channels of exchange rate and interest. The inspiration for this is because several researchers have cautioned that conclusions on twin deficits may be biased if other relevant explanatory variables such as interest rate and exchange rate are omitted. Partly for this reason this study has incorporated these two variables into the study. Suchismita and Sudipta (2011), results from bivariate and multivariate models show that there is evidence in favour of bidirectional causal relationship between the two deficits. But the hypothesis that budget deficit exacerbates the current account deficit cannot hold for India. The results suggest that the internal deficit is not the main cause of the external deficit. The reverse causation observed by Lau and Baharumshah (2006) in SEACEN countries runs from external to internal deficit and is much stronger in terms of statistical significance. On the direction of causation among the four variables, the relationship is inconclusive. This is because while causal relationship could be established between fiscal deficit and exchange and interest rate; such relationship could not be established between current account deficit and exchange and interest rate.

The work of Omoniyi, Oseni and Onakoya (2012) is one of the scarce studies in Nigeria. They used VAR and ECM and time series data for 1970-2008 to study the economic implication

of budget deficit and trade deficit in Nigeria. They opine that both deficits have economic implication for Nigeria although the probable exact effects of budget deficit on trade deficit are still the subject of widespread debate and controversy among macroeconomists. The result of their study is that there is a strong link between budget deficit and trade deficit in Nigeria. The result also supports the existence of bidirectional causality between budget deficit and trade deficit. They recommend appropriate policy measures to reduce budget deficit which will most likely lead to reduction of trade deficit.

Section (III) Methodology of the study

Before we look at the methodology of the study, we briefly look at the theoretical framework, which is based on the Mundell-Fleming analysis and the Keynesian open economy identity. In a Mundell-Fleming analysis, budget deficit causes upward pressure on interest rates which in turn trigger capital inflows and appreciation of the exchange rate. This implies imports get cheaper and exports dearer leading to exchange rate. This leads to deterioration in the trade deficit under a flexible exchange rate system. In a fixed exchange rate regime, the budget deficit would generate higher real income or prices and this would worsen the current account balance. Thus budget deficit widens the current account deficit under both flexible and fixed exchange rate regimes. Under the Keynesian open economy identity also associated with the Mundell-Fleming, an increase in budget deficit increases domestic absorption, which leads to import expansion and worsen the trade deficit. Also budget deficit implies great spending on domestic as well as foreign goods. The Keynesian Open macroeconomy identity can be used to clarify the relationship between the two variables. $Y = C + I + G + (X - M)$……………..(1) where Y = National Income representing GDP, C = Consumption of households; I Investment expenditure of firms; G = Government expenditure on goods and services; $(X - M)$ is the foreign sector with (X) for exports and (M) imports. Further, we state that Income is part consumed (C) and part saved (S) and part paid as tax (T), so that $Y = C + S - T$ …….(2). If we combine equations (1) and (2) we have $C + S + T = C + I + G + (X-M)$………..(3). Further, analysis will give national income identity explaining the relationship between budget deficits and trade deficits as: $T - G = (X - M) + (I - S)$………….(4). What equation (4) is saying is that if trade surplus or deficit $(X - M)$ declines, then excess investment over savings $(I - S)$ must also decline or both happens.

Estimation Techniques

Times series data of GDP Fiscal Deficit, real exchange rate and real interest rate for 1970-2013 are obtained from Central Bank of Nigeria (CBN) statistical Bulletin. The data are analyzed for Unit Root using ADF and P-P and cointegration using Johansen technique. Thereafter, Ordinary Least Squares tests are done.

Model Specification
CAB = f(GFD, EXCH, INT)
Where GFD = Government Fiscal Deficit
CAB = Current Account Balance proxied by Balance of Payments
EXCH = Real Exchange Rate
INT = Real Interest Rate
Put in econometric equation we have
$CAB = a_0 + a_1 GFD + a_2 EXCH + a_3 INT + e$

Section iv: Presentation, Analysis and Interpretation of Data

Regression analyses are done based on Ordinary Least Squares (OLS) techniques. But before this, preliminary statistical tests are done for unit root using Augmented Dickey-Fuller (ADF) and Phillip-Peron (P-P) techniques. Long run relationship among the variables is established through Johansen cointegration test.

Unit Root Tests

Regression time series data may produce high coefficient of determination (R^2) though there may be no meaningful relationship existing between the variables. The results produced in such a case will be with spurious conclusions. To get over this possibility, we conduct unit root test and cointegration tests. The unit root test here is done by Augmented Dickey-Fuller (ADF) and Phillip-Peron (P-P) techniques. The underlying Null proposition is that there is no unit root.

Table 1: Unit Root Test by ADF

Variables	ADF	Order of Integration	Level of Significance
GFD	-5.391831	1(0)	1%
INT	-9.563603	1(1)	1%
CAB	-9.043349	1(1)	1%
EXCH	-6.435760	1(1)	1%
ECM	-7.528142	1(1)	1%

From the above GFD is integrated at level while others are integrated at first difference. We conclude that there is unit root among the variables at 1% significance level.

Table 2: Unit Root Test for P-P

Variables	ADF	Order of Integration	Level of Significance
GFD	-5.391831	1(0)	1%
INT	-9.724965	1(1)	1%
CAB	-9.132303	1(1)	1%
EXCH	-6.435844	1(1)	1%
ECM	-6.46105	1(0)	1%

From the table, we discover that GFD and ECM are integrated at their level form while others are integrated at first difference. That means that the variables have stationarity or unit root at 1% level of significance.

Cointegration Test

Another preliminary statistical test is cointegration to establish long run relationship between the variables. Below is the summary of Johansen's Cointegration done on the variables.

Table 3: Johansen's Cointegration Test

Hypothesized No. of C.Es	Eigenvalue	Trace Statistics	0.05 critical value	Prob.
None*	0.536392	48.54614	47.85613	0.0430
At most 1	0.218811	16.26036	29.79707	0.6938
At most 2	0.114350	5.888926	15.49471	0.7086

At most 3	0.018604	0.788732	3.841466	0.3742

Trace test indicates 1 cointegration equation (C.E) at 5% level of significance. *denotes rejection of the hypothesis at 0.05 level.

Table 4: Unrestricted Cointegration Rank Test (Max Eigenvalue)

Hypothesized No. of C.Es	Eigenvalue	Trace Statistics	0.05 critical value	Prob.
None*	0.536392	32.28606	27.5834	0.0115
At most 1	0.218811	10.37143	21.13162	0.7092
At most 2	0.114350	5.100194	14.26460	0.7291
At most 3	0.018604	0.788732	3.841466	0.33745

Maxi eigenvalue test indicates 1 cointegration equation (CE) at 5% significance level. *denotes rejection of the hypothesis at 0.05 level.

Johansen's cointegration tests show that the variables are cointegration and so can be used for valid regression analysis.

We then proceed to conduct Ordinary Least Squares tests.

Table 5: Ordinary Least Squares (OLS) Results

Variables	Coefficient	T-Statistics	Probability	Remarks
Constant	5.437801	4.883795	0.0000	
GFD	-0.154509	-0.009351	0.9926	
INT	-0.186796	-2.619378	0.0126	
EXCH	0.037024	4.793109	0.0000	
ECM	-0.282307	-3.286362	0.0038	

R^2	0.629214	Mean dependent Var	10.00530
Adjusted R^2	0.590184	S.D dependent Var	3.715246
S.E of regression	2.378386	Akaike info criterion	4.679665
Sum squared resd.	214.9553	Schwarz criterion	4.884456
Long Likelihood	-95.61280	Hann-Quinn criterion	4.755186
F-statistics	16.12123	Durbin-Watson stat	1.591143
prob. (F-stat)	0.00000		

Interpretation of results

      The Coefficient of Determination (R^2) is approximately 63% showing reasonable goodness of fit of the model. That means that the explanatory variables can explain 63% of variations in the dependent variable – Current Account Balance.

      The F-statistics measure the overall significance of the model. From Table V above it is 16.12123 with p-value of 0.0000. Since the probability of the F-statistics is less than the desired 0.05 significance level, we accept the overall significance of the model.

      From the regression estimation, government fiscal deficits has negative value of -0.154509 indicating that a unit decreases of GFD will decrease CAB by -0.15%. The interest rate is also negative with a value of -0.186796 suggesting that a unit decrease of interest will

decrease current account balance by -0.19%. Real Exchange Rate (RER) is positive at 0.0370024 meaning increase of exchange rate will increase current account balance by 0.037%. This appears to be in agreement with theoretical expectation, that appreciation of foreign currency will make imports higher and discourages importation while encouraging exportation.

The t-statistics measures the statistical significance of the individual parameters in the model. Government fiscal deficits (GFD) are statistically insignificant with a t-value of 0.009351 and effect is negative. This implies government fiscal deficits do not affect current account balance. Interest rate has t-statistics value of 2.619378 (greater than critical value of 2) and is statistically significant at 5% level of significance. For the exchange rate, the t-value is 4.793109 (again greater than critical value of 2) is statistically significant at 10% level of significance.

Durbin-Watson statistic is approximately 2 and indicates absence of auto correlation.

Error Correction Model (ECM) of -3.286362 is significant with appropriate negative sign and indicates the corrections in any disequilibrium in the model will cause changes in independent variables to attain long run equilibrium.

Hypotheses Testing

The Null hypotheses stated in section I, are tested here using the results of Ordinary Least Squares analysis presented in Table IV.

Hypothesis I

H_{01}: Government fiscal deficits do not have significant and positive effect on current account balance proxied by balance of payments in Nigeria. Drawing inference from Table V, we observe that GFD is 0.009351 with p-value of 0.9926. Since 0.9926 is greater than 0.05 level of significance, we accept the Null hypothesis. This means the government fiscal deficit does not have significant effect on current account balance. This also suggests the absence of twin deficits hypothesis in Nigeria – that is that government deficit spending does not create deficits in the external trade balance. Studies in this field in Nigeria are scarce. Omoniyi, Oseni and Onakoya (2012) in their study could not determine the existence of twin deficit hypothesis.

Hypothesis II

H_{02}: Real Exchange rate does not have significant and positive effect on current account balance in Nigeria.

From Table V, the t-statistics for EXCH is 4.793109 with p-value of 0.0000 which is less than 0.0%. We, thus, reject the Null hypothesis and accept Alternative that Real Exchange Rate has significant effect on current account balance in Nigeria. This agrees with Lau and Baharumshah (2006) in their study of nine SEACEN countries.

Hypothesis III

H_{03}: Interest Rate does not have significant and positive effect on Current Account Balance in Nigeria. If we look at Table V, we see that interest rate has t-statistics value of 2.619378 with P-value of 0.0126. P-value is less than 0.05% and so we reject the Null hypothesis and accept the Alternative that interest rate has significant effect on current account balance in Nigeria. Similarly as in hypothesis II, this agrees with the finding of Lau and Baharumshah (2006).

Section (v) Conclusion and Recommendation

From the finding in hypothesis 1 that government fiscal deficits do not have positive and significant effect on current account balance, we conclude that there appears to be no twin deficits hypothesis in Nigeria. The huge growth in external trade deficits may not be linked to government bloated fiscal deficits. Nigeria is heavily imports dependent in most aspects of the economy. However, there are still controversies about the existence of this hypothesis in Nigeria.

Secondly, the finding that exchange rate significantly affect current account balance is not surprising. External trade is financed by foreign currency evaluated by exchange rate. That implies that as current account balance increases, exchange rate increases (that is deteriorates).

Thirdly, from the finding that interest rate has significant and positive effect on current account balance, we say that higher current balance will demand more borrowing resulting in higher interest rate.

In recommendations, we first advise that even when bloated trade deficits is not directly linked to government fiscal deficits, there is need to regulate external trade by other sectors by encouraging reduction in importation.

Second, government should deal with exchange rate fluctuation which has produced series of economic dislocation, finally, ever rising interest rate incapacitates the domestic productive sector and this should be tackled.

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APPENDIX

Year	Govt. Fiscal Def.	Real EXCH Rate	Real INT Rate	BOP m
1970	-455.10	0.17	0.8	885.4
1971	+171.60	071	10.0	1293.4
1972	-58.80	0.66	10.0	1434.3
1973	+166.10	0.66	10.0	2278.4
1974	+179.40	0.63	10.0	5794.5
1975	+2390	0.62	9.0	4925.5
1976	-190.80	0.63	10.0	6751.10
1977	-781.40	0.65	6.0	7630.7
1978	-2821.90	0.61	11.0	6064.4
1979	-1461.70	0.61	11.0	14188.0
1980	-1975.20	0.55	9.50	2400.10
1981	-3902.10	0.61	10.0	+2402.10
1982	-6104.10	0.67	11.5	1398.3
1983	-3364.50	0.72	1.5	+1398.3
1984	-2660.40	0.76	13.0	-301.3
1985	-3039.70	0.89	11.75	354.9
1986	-8245.3	2.0206	10.50	-784.30
1987	-5889.7	4.0179	17.50	159.20
1988	-12160.9	4.5367	16.50	-2294.1
1989	-15134.7	7.3916	26.80	8727.8
1990	-22116.10	8.3078	25.50	18498.2
1991	-35755.2	9.9095	20.01	5959.6
1992	-39532.5	17.2984	29.80	-65271.0
1993	-107735.3	22.0511	18.32	136175.9
1994	-70270.6	21.8861	21.00	-42623.3
1995	-13389.9	21.8861	20.18	-195316.0
1996	-1000.0	21.8861	1974	52152.0
1997	-32049.5	21.8861	13.54	1076.3
1998	-5000.0	21.8861	18.29	-2206.75
1999	-285104.7	92.6934	21.32	-3266.34
2000	-296105.7	95.6550	22.15	31.4139.2
2001	-103777.3	102.1052	18.29	314139.2
2002	-201401.7	120.9702	24.40	24738.7
2003	202724.7	129.3565	20.48	-863428.9
2004	-172406.3	133.5004	19.15	-1622998.4
2005	-161406.3	132.1470	1785	1124157.2
2006	-101397.5	132.1470	17.3	134256.60
2007	-11723.5	125.8331	16.94	1366755.0
2008	-4738.5	1185569	15.14	12384568.00
2009	-810008.5	148.9017	18.36	1284567.00
2010	-1105439.8	150.2980	17.36	234745.6

2011	-113000388.3	155.50	23.32	1295745.25
2012	-1238364.0	155.50	22.39	1321144.5
2013	-6269373.65	155.50	22.86	1321144.5

SOURCE: CBN Bulletin-Various Issues