



# GOVERNMENT FISCAL DEFICITS AND EXCHANGE RATE VARIATIONS IN NIGERIA, 1970-2013

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## Abstract

*This study examined the effects of government fiscal deficits on real exchange rate variations in Nigeria. The period covered by the study is 1970-2013. Secondary data sourced from Central Bank of Nigeria (CBN) Statistical Bulletin were used. Preliminary statistical tests were carried out using the techniques of Augmented Dickey-Fuller (ADF) and Philip-Peron (P-P). These tests established the existence of unit root among the variables. The Johansson cointegration technique was used to confirm that the variables have long-run relationship. After these preliminary tests, two stage- least -squares (2-SLS) regression analysis was used to test the hypothesis. The results obtained show that government fiscal deficits have insignificant but positive effect on exchange rates and balance of payments. The study recommended that government should reduce fiscal deficits to improve exchange rate variations or ensure that the deficits are for projects with positive NPV in order to stabilize the macro economy through adherence to the fiscal responsibility.*

**Keywords:** Aggregate Demand, Exchange Rate, Government fiscal Deficits, Macroeconomics

## Introduction

### Background to the Study

In every fiscal year, which in Nigeria corresponds to the conventional year of January to December, the government prepares a budget that may be surplus, deficit or balanced. However, it is observed for some decades after independence (1960) the fiscal year was April to March of the following year. Some countries still adopt this type of budget period for example United Kingdom. According to Dalyop, (2010) a budget is surplus when planned revenue is greater than planned expenditure. It is deficit when projected revenue is greater than planned expenditure. There is balanced budget when planned revenue equals planned expenditure. Despite huge revenue from oil, Nigeria has operated near persistent fiscal deficits. The situation is worsened by tax revenue collection system be-devilled by widespread tax evasion, tax avoidance and inefficient administration. Part of the problem is the low per capita income which results in poor income tax payments. The explanation is not farfetched since low income implies low tax liability and payments. There is also the existence of a large number of self-employed people whose tax liability

cannot easily be assessed. Recently oil theft and collapsing crude oil price in the international oil market have not helped matters. As a result of these shortcomings, the government has to engage in fiscal deficit financing to provide amenities, infrastructure and run the different ministries, departments and agencies.

For instance, from 1970 to date, Nigeria has engaged in persistent fiscal deficit financing except for few years. According to Ezeabasili, Ioraver and Herbert (2012) fiscal deficits persistent for the entire period except for 1971, 1974, 1975, 1979, 1996 and 1997. A look at the table in Appendix confirms this. It will also be seen that deficit started with ₦455 bn in 1970, rising to ₦4957.20 bn in 1980, ₦22116.10bn in 1990, ₦296105.70 bn in 2000, ₦1105439.80bn in 2010 and dropping to ₦6269376.15 bn in 2013. Ironically fiscal deficits have grown with increase in revenue from oil. Persistent fiscal deficits affect economic variables for good or for bad, including the real exchange rate.

Since the Great Depression when Keynes came up with the theory of Aggregate demand, fiscal deficits have taken up added importance as sources of finance for government. It is of note that fiscal expansion is beefed up by the operation of the multiplier. This means that the effects of fiscal deficits of government expenditure far exceed the amount of expenditure.

In other words, Keynes argued that balancing the budget in line with the Classical theory of the self-equilibrating Say's Law of the market may not always be possible. Says law of the market argues that the economy is self-regulating and government need not engage in any fiscal deficit to increase demand. Says' law states that supply is capable of generating its own demand. Contrary to these arguments, Keynes stated that through deficit spending the government will increase demand and improve public investment that complements private investment. Keynes refused to accept that an economy is self-equilibrating

However, Government fiscal deficits and their effects on macroeconomic variables including exchange rate remain matter of debate among macroeconomists, policymakers and researchers. Chrystal and Thorton (1988), Mondud (1999), Fay and Porter (2006), for example, posits that government fiscal deficits are used to develop infrastructure, money and capital markets. They also provide social services in education and health that indirectly benefit the private sector firms. Conversely, other authorities such as Mohanty (2012), and Alesina (2012) opine that government fiscal deficits have adverse effects on the macro-economy. Mandilaras and Bird (2004) confirm that fiscal deficits result in macroeconomic imbalances that culminate in economic crises. These often, in turn, result in the World Bank and International Monetary Fund (IMF) becoming involved in designing of policies. These policies often worsen the situation as they do not take the peculiarities of these countries into account. They argue that local borrowing to finance deficits crowd out the private sector and adversely affect the exchange rate of the local currency. It is against this background that this study is carried out to investigate the effect of government fiscal deficits on exchange rate fluctuations in Nigeria. Using recent development in time series econometrics, this study is able to estimate the effect of government fiscal deficits on real exchange rate.

The study has a lot of significance for policymakers in government especially when the budget office of the ministry of finance is preparing the perennial fiscal deficit budget. It will also benefit other researchers in this field by adding to the existing literature.

The scope of the study is limited to 1970 to 2013. It is also limited to Federal Government fiscal deficits because the figures are readily available. Figures for sub-national governments are either incomplete or not available (Islam and Wetzel, 1991)

The work is arranged in five sections;

- i. Section (i) is on the introduction;
- ii. Section (ii) reviews the related literature;
- iii. Section (iii) is the methodology of the study and data presentation.
- iv. Section (iv) is on the analysis and interpretation while;
- v. Section (v) concludes with recommendation.

## Literature Review

The study employed a theoretical framework of the Keynesian eclectic National Income identity for open economy model of  $Y = C+I+G+X-M$ . Here  $Y$  = National Income,  $C$  represents private consumption of Households,  $I$  represents private investment of the business sector,  $G$  stands for government expenditure in which fiscal deficits is embedded,  $X$  stands for exports and  $M$  represents imports. Government fiscal deficits enter the economy through tax cuts/ increases, subsidies and transfer payments. Government tax cuts/increase affect private consumption ( $C$ ) by increasing or decreasing disposable income. Tax rebates, capital allowances and subsidies also affect investment of firms ( $I$ ). In the external sector ( $x-m$ ) effects are felt through import duties cuts/increases and export duties cuts/increases. In all these ways government deficits affect the entire economy through the process of circular flow of income. As stated earlier, the effects are amplified by the operation of the multiplier so that the effect of fiscal deficits is much larger than deficits that are incurred.

There are a series of studies in the literature on the relationship between government fiscal deficits and exchange. The exchange rate is the price of one currency in terms of another. According to Nzotta (2004), it is the rate of transformation of one currency to another or the rate at which one currency is exchanged for another. He adds that exchange rates are maintained by arbitrage. It is the mechanism whereby speculators purchase foreign currency in a market where price is low and sell in other markets where its price is high. Dwivedi (2008) argues that demand and supply of foreign exchange is derived from the demand for foreign goods, services and securities. This is the case of floating or fixed exchange rate. By fixed exchange rate, the monetary authorities set the rate by fiat. In either of these cases, the exchange rate fluctuations will differ in their effects.

The effect of government fiscal deficits on exchange rates has produced a lot of theoretical and empirical works. Fischer (1989) states that when government finances its deficits by running down reserves, there will be appreciation of exchange rates. The policy is often not sustainable and results in capital flight and balance of payments problems. Ultimately, the government has to devalue its currency. Cespedes and Gali (2013) observe that the government deficits are negatively correlated with the real exchange rate. This means that high government consumption appreciates the real exchange rate. Under fixed exchange rate an increase in fiscal deficit raises the exchange rate which in turn tends to appreciate the domestic currency. This is the fate facing most developing countries including Nigeria where the economy is heavily dependent on imports.

Khan, Akhatar and Rana (2002) did an empirical study on the relationship between fiscal deficit and real exchange rate in Pakistan using period 1982-1998. They used Ordinary Least Squares (OLS) technique, and reported that fiscal deficit has significant direct effect on real exchange rate in Pakistan. In a related study, Gulcan and Bilman (2005) examined the Turkish economy and found that fiscal deficits reduction affects exchange rate directly and indirectly. Direct effects decrease exchange rates, while indirect effects increase the exchange rates. They justify this opinion by holding that when government directly reduces fiscal deficits, there will be fall in demand for loanable funds followed by fall in interest rates and exchange rates decrease in deficits may also have indirect effect as decrease in deficits leads to a fall in the stock of domestic government securities. This in turn decreases the foreign exchange risk premium. This is when the exchange risk premium falls, demand for domestic securities may increase followed by appreciation of the exchange rate vis-a-vis the local currency.

Islam and Wetzel's (1991) made a study of the economy of Ghana. They state that official exchange rate is a negative function of the street market premium. This means that an increase in the street market premium lowers (appreciates) the official real exchange rate while a decrease in the premium raises the official real exchange rate. Korsu (2007) in an empirical work on Sierra-Leone's economy used Three-Stage Least Squares (3-SLS) and simulation analysis, to examine the effect of fiscal deficits on external trade in Sierra-Leone. His results are that real exchange rate is an important channel through which government fiscal deficits affect the foreign sector of the economy. This is true as monetary economics states the exchange rate is one of the monetary policy transmission mechanisms

In Nigeria, Egwaikhide, Chete and Falokun (1994) did a study on exchange rate depreciation, fiscal deficits and inflation. Using Two-Stage Least Squares (2-SLS), they found that exchange rate is one of the important factors that enlarge government fiscal deficits over time. Odusola and Akinlo (2001) did a study of fiscal deficits, inflation and exchange rate in Nigeria. Their study states that impulse response functions of fiscal expansion (increase in fiscal deficit) impact negatively on exchange rate (depreciate) in the medium and long term.

## Methodology

The study employs secondary data sourced from Central Bank of Nigeria (CBN) statistical Bulletin (various issues). The model for the study is adapted, from the study of Khan, Akhatar and Rana (2002) and is stated as  $EXR = f(GFD, BOP)$  which when put in econometric equation is stated as;

$$EXR = b_0 + b_1GFD + b_2BOP + \mu \text{ where}$$

EXR = Real Exchange Rate

GFD = Government Fiscal Deficit

BOP = Balance of Payments

$b_0$  is the intercept while  $b_1$ ,  $b_2$  are coefficients of the independent variables and  $\mu$  is the error term.

EXR is the dependent variable while GFD and BOP are the independent variables. The additional variable of BOP has been added for investigation because changes in exchange rates are greatly felt in the balance of payment position. A priori expectations are that

$b_1 > 0$  or  $< 0$  while  $b_2 > 0$ .

## Data Analysis and Interpretation

Data for the analysis is in Table 1 (appendix). Preliminary statistical tests of unit root and cointegration test are conducted. Augmented Dickey-Fuller (ADF) and Philip-Peron tests are to establish stationarity of data while cointegration test is performed by Johansen technique to establish that long run relationship exists among the variables.

**Table 2: Unit Root Test by ADF and P-P**

VARIABLES	ADF LEVEL	FIRST DIFFERENCE	LEVEL P-P	FIRST DIFFERENT
EXR	-1.013125	-3.029773	-1.039758	-4.915364
Log GFD	-0.270929	-6.727675	-0.992562	-10.65458
Log BOP	-1.373320	-6.310143	-0.606185	-11.39419

The ADF results in Table 2 show that the variables are integrated of order one and are stationary at first difference. The Philip-Peron (P-P) test reinforces the ADF results.

**Table 3: Johansen's Cointegration Test**

Variables	Eigen Value	Likelihood Ratio (L/R)	5% Critical Value	1% Critical Value	C.E
EXR	0.490290	54.48887	53.12	60.16	At most 1
Log BOP	0.074328	6.77381	19.96	24.60	None
Log GFD	0.035718	1.818583	9.24	12.97	None

The cointegration test results in Table 3 show one cointegration unit where L/R 54.48889 is greater than 5% critical value of 53.12. With at least one cointegration equation, we accept that cointegration relationship exists between the variables. Apart from the main variable, EXR, we also consider BOP because changes in Exchange rate will definitely affect the balance of payments.

We proceed to test the Null hypothesis that government fiscal deficits do not have significant and positive effect on Exchange Rate in Nigeria, using Two-Stage Least Squares (2-SLS). Table 4 shows the result of 2-SLS tests.

**DECISION RULE:** If t-value is greater than 2, reject Null and Accept Alternative hypothesis at 5% significance level. For significance, P-value should be less than 0.05.

**Table 4: Result of 2-SLS tests**

VARIABLES	COEFFICIENT	STD. ERROR	(T-VALUE) T-STATISTICS	P-VALUE
EXR	0.028767	2.357318	0.012202	0.9903
EXR (1)	0.085271	0.246286	0.346244	0.7311
Log GFD	3.910628	2.347418	1.665927	0.0140
Log GFD (-1)	0.700931	2.842078	0.246626	0.8065
Log BOP	1.962286	1.315374	1.491809	0.1440
Log BOP (-1)	2.863865	1.608303	1.780674	0.0830

R-squared ( $R^2$ ) 0.748961

Adjusted  $R^2$  0.707635

S.E. of Regression 14.44228

F-statistics 2.236827

Prob. (F-stat) 0.056266

Mean dependent variable 1.481837

S.D dep. Variable 15.92588

Sum sq. variable 7926.015

Akaike info criterion 8.391848

Schwarz criterion 8.467608

Durbin Watson (D-W) stat 1.603018

### Interpretation of Regression Results

The real exchange rate has positive coefficient and the independent variables also are positive with one period lag. When we consider EXR 0.028767 and GFD 3.910628 and BOP 2.863865, we note exchange rate has smaller intercepts' than Government deficits and balance of payments. This means that exchange rate fluctuation is lower in response to increases of government fiscal deficits and balance of payments. With t-statistic for GFD at 1.665927 and BOP at 1.491890, their values are lower than 2 and so we accept Null hypothesis; namely that exchange rate has no significant but positive effect on government fiscal deficits and balance of payments. None of the variables have any statistical significance at 5% level. This finding does not agree with the study of Cespedes and Gali (2013) whose study on 55 developing countries observes that fiscal deficits are negatively correlated with real exchange rate. Similarly, this study also disagrees with Egwaikhide, Chete and Falokun (1994), and the findings of Odusola and Akinlo (2001). Both studies respectively found negative effect of fiscal deficits on exchange rates in Nigeria. When we consider other statistics, we note that over 70% changes or variations in exchange rate are explained by changes in fiscal deficits and balance of payments. With Durbin-Watson (D-W) at 1.603 (approximately 2), we can say there is absence of auto-correlation.

### Conclusion and Recommendation

In Conclusion, we observe that effects of government fiscal deficits on macroeconomic variables have remained controversial. Some extol the benefits of fiscal benefits (Chrystal and Thorton, 1988; Fay and Porter, 2006). Conversely, others emphasize the harmful effects (Alesina, 2012; Mohanty, 2012). This controversy extends to real exchange rate as one of the variables. While fiscal deficits affect many macroeconomic variables, this study considers the effect on real

exchange rate and balance of payments. This is because exchange rate always exercises overwhelming influence on balance of payment. The study concludes that fiscal deficits and balance of payments have insignificant but positive effects on exchange rate variations. However, it should be noted that deficits 'per-se' cannot be viewed as harmful if they are used to finance projects with positive NPV that support macroeconomic stability. It is recommended that the government should reduce bloated fiscal deficits to shore up the exchange rate. It can do so through strict implementation and adherence to fiscal responsibility in the medium term expenditure framework. This will help to stabilize the economy. Moreover, the economy is heavily import dependent and so changes in exchange rate affects the entire economy.

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## Appendix

**Table 1: Data Used For Analysis**

Year	BOP ₦m	Real Exch Rate %	GFD N bn
1970	46.70	0.71	-455.10
1971	117.40	0.70	171.60
1972	57.20	0.66	-58.80
1973	197.50	0.66	166.10
1974	3102.20	0.63	1796.40
1975	157.50	0.62	427.90
1976	-339.00	0.63	-1090.80
1977	-527.20	0.65	-781.41
1978	-1293.60	0.61	-282.90
1979	1868.90	0.60	1461.70
1980	2402.20	0.55	-1975.20
1981	-3020.80	0.61	-3902.10
1982	-1398.30	0.67	-6104.10
1983	-301.30	0.72	-3364.50
1984	354.90	0.76	-2660.40
1985	-349.10	0.89	-3039.70
1986	-4099.10	2.0206	-8245.30
1987	-17964.80	4.0179	-5889.70
1988	-120795.00	4.5367	-12160.90
1989	-22993.50	7.3916	-15134.70
1990	-5761.90	8.3078	-22116.10
1991	-15796.60	9.9095	-35755.20
1992	-101404.90	17.2984	-39532.50
1993	-41736.80	22.0511	-107735.30
1994	-42623.30	21.8861	-70270.60
1995	-195216.30	21.8861	-133389.90
1996	-53152.00	21.8861	1000.00
1997	1076.30	21.8861	32049.40
1998	22067.30	21.8861	-5000.00
1999	-326634.30	92.6934	-285104.70
2000	314139.20	102.11	-296105.70
2001	24729.90	111.94	-103777.30
2000	-563483.90	120.9702	-301401.70
2003	-162298.20	129.3565	-202724.70
2004	1124157.20	133.5004	-172601.30
2005	-2394864.30	132.1470	-161406.30
2006	-2206500.50	128.65	-101397.50
2007	-1811849.38	125.8331	-11723.50
2008	-2458305.37	118.5569	-47378.50
2009	-3910547.14	148.9017	-810008.50
2010	-2298564.44	150.2980	-1105439.80
2011	-505385.29	155.86	-11300388.30
2012	-134543.40	80.61	-1238364.00
2013	-314964.35	118.29	-6269376.15

Source: CBN Statistical Bulletin (Various issues)