FISCAL DEFICITS AND MACROECONOMIC AGGREGATES IN NIGERIA

Wosowei Elizabeth
Department of Economics, University of Nigeria, Nsukka

Abstract
The study was carried out to determine the relationship between fiscal deficit and macroeconomic performance in Nigeria over the period 1980 to 2010. The specific objectives include: to determine the impact of fiscal deficit on macroeconomic aggregate in Nigeria, to examine whether fiscal deficit had led to economic growth in Nigeria, and to find out the nature of relationship between fiscal deficits and macroeconomic aggregates in Nigeria using data from secondary sources. The study employed the Ordinary Least Square in estimating the equation. Preliminary test of stationarity and co integration of variables using the Augmented Dickey Fuller (ADF) test and the co integration test using the Engle Granger procedure were conducted respectively. However, the empirical findings showed that fiscal deficits even though that it met the economic a prior in terms of its negative coefficients yet, did not significantly affect macroeconomic output. The result also show a bilateral causality relationship between government deficit and gross domestic product, government tax, and unemployment, while there is an independent relationship between government deficit and government expenditure and inflation. Based on these findings, appropriate recommendations were made.

Background of the study

In any economic system, there is always the need for government to undertake very useful measures aimed at shaping various developmental aspirations. One of such measures is fiscal/budget deficit. The relationship between budget deficits and macroeconomic variables (such as growth, interest rates, trade deficit, exchange rate, among others) represents one of the most widely debated topics among economists and policy makers in both developed and developing countries (Saleh, 2003). This relationship can either be negative, positive or a no positive or negative relationship. The differences on the nature of the relationship between budget deficits and these macroeconomic variables as found in economic literatures according to Chitua (2010), could be explained by the methodology the country and the nature of the data used by the different researchers. Most of the studies regress a selected macroeconomic variable on the deficit or the deficit on the macroeconomic variables. Writing about the macroeconomic impact of fiscal deficit, James Tobin, the Nobel laureate in Economics in 1981, observed: "Few issues of economic theory and fact evoke such polar disagreement. The contesting views carry relatively   divergent   implications   for   public   fiscal   and   financial   policy".

There is a sharp divergence of views on how fiscal deficit affects the economy. The conventional view, embodied in the Washington Consensus and held by the international financial institutions (IFIs), is that fiscal deficit, particularly in the context of developing countries, represents the most   important   policy   variable   affecting   the   rest   of   the   economy.

According to this view, the relationship between fiscal deficit and other macroeconomic variables is set to depend on how the deficit is financed. It stipulates that money creation leads to inflation, government borrowing crowds out private investment and external debt leads to

balance of payments crises (Easterly and Schmidt, Fiscal Deficit and Macroeconomic Performance in Developing Countries, World Bank Research Observer, 1993).

On the contrary, many economists question the validity of the view that budgets should always be balanced. James Tobin is of the view that what is really important is appropriate fiscal policy which may or may not balance the budget. He argues that there are built-in stabilizers in the fiscal system and that deficit performs a useful function in absorbing savings that would otherwise be wasted in unemployment, excess capacity or lower output. This view is shared by Willem Buiter who maintains that even in the long- run equilibrium; zero is not a uniquely interesting figure for the budget deficit (Principles of Budgetary and Financial Policy).

Fiscal deficit could be seeing from many angles. It is the gap between the government's total spending and the sum of its revenue receipts and non-debts capital receipts, (Buhari 1994). It represents the total amount of borrowed funds required by the government to completely meet its expenditure. It could also be defined as the excess of total expenditure including loans net of payments over revenue receipts and non-debt capital receipts. It also indicates the total borrowing of the government, and the increment to its outstanding debt.

Despite the fact that realized revenues are often above budgeted estimates, extra budgetary expenditures have been rising so fast and result in fiscal deficit, Anyanwu (1997), and Robini (1991), shows that budget deficit in developing countries are heavily influenced by the degree of political instability as well as public finance considerations with no apparent direct effect of elections. Investigations show that Nigeria was caught in the deficit trap since early 1980s when the world oil market collapsed. Since then, there have been frantic efforts to exit the deficit trap but all to no avail instead, the mode of financing the deficit has been the major factor including rapid monetary growth, exchange rate depreciation and rising inflation.

Statement of problem

In spite of government efforts at devising policy measures aimed at overcoming fiscal deficit, fiscal deficit has persisted in the Nation's economy which its adverse effect is being perceived on key macro-economic variable. In less developed nations, borrowing from international financial institutions and Central Bank to finance sizeable portion of the deficits contribute to liquidity and inflation.

This is because rather than spending the borrowed money on capital expenditure such as building roads and dams improving agricultural sector, etc which may improve standard of living of the people, and hence, their productivity which in turn, may improve the country's economic growth, this borrowed money is spent on pension and transfer payment. This has led to situations where expenditure could not be curtailed, resources could not be raised for fear of adverse effects, and greater deficits fuelled further inflation.

The impact of fiscal deficit on macro-economic aggregates depends on the financing techniques (Inflation tax or bond financed deficit). Money creation to finance deficit often leads to inflation while domestic borrowing inevitably leads to a credit squeeze through higher interest rates or through credit allocation (see Easterly and Robello 1994, Sowa, 1994). It is pertinent to note that

Nigeria has relied very much on inflation tax (about 70%) and the non-banking holding about 15-20% in government bond, (see, Diamond, S.B. and Ogundare, S.O. (1982). The exact quantitative impact of such mix of deficit financing can better be X-rayed by the impulse response function. Some researcher believe that fiscal deficit has a positive relationship (with output growth while others state that deficits are negatively with output growth accumulation and hence negatively with output growth (see Egwaikhide 1995, Soludo 1998).

It is therefore a core research issue and this is the pivot of this study. To critically look at the impact of fiscal deficit on macroeconomic aggregate in Nigeria. Currently, there is no consensus on the matter. The level of economic development and the fiscal structure of Nigeria compound this problem. Besides, previous studies have advanced in characterising the implications of alternative sources and composition of deficits spending without investigating whether fiscal deficit lead to economic growth. In the light of the above discussion, this study addressed the following question:

i.   What is the impact of fiscal deficits on macroeconomic aggregates in Nigeria?
ii.   Does fiscal deficit lead to economic growth in Nigeria?
iii.   What is the nature of the relationship between fiscal deficit and output growth in Nigeria

Objectives of the study

The broad objective of the study is to determine the relationship between fiscal deficit and macroeconomic performance in Nigeria. Specifically, the study will:

i.   Determine the impact of fiscal deficits on macroeconomic aggregates in Nigeria.
ii.   Examine whether fiscal deficit leads to economic growth in Nigeria.
iii.   Find out the nature of relationship between fiscal deficits and macroeconomic aggregates in Nigeria.

Statement of Hypothesis

H_0: There is no significant relationship between fiscal deficit and inflation, government taxes in Nigeria

H_0: There is no significant relationship between government deficit and government expenditure in Nigeria

H_0: There is no significant relationship between Fiscal deficits and unemployment, economic growth in Nigeria

Scope of the Study

The study is on "fiscal deficit and macroeconomic performance in Nigeria". Hence, it entails the use of macroeconomic variables such as Gross Domestic product (GDP) a proxy for economic growth, government expenditure (GEXP), Inflation rate (INF), government deficit (GDEF), government taxes (GTAX), and unemployment (UNEMP).The data on the above variables will cover the period 1980-2010. The choice of this period is based on data availability.

Method of Study

The study made use of secondary data and our analytical tool was ordinary least square (OLS). Following the broad objective of this study which is to "Investigate the Relationship between Government Deficit and Macroeconomic Performance in Nigeria", below are the models that will be tested:

$GDP = \alpha o + \alpha_1 GEXP + \alpha_2 INF + \alpha_3 GDEF + \alpha_4 GTAX + U$ ………………………   1   and

$GDEF = \alpha o + \alpha_1 GEXP + \alpha_2 INF + \alpha_3 GDP + \alpha_4 GTAX + \alpha_5 Unemp + U$ ………… 2

Where:

GDP= Gross Domestic Product (a proxy for economic growth0

GEXP= Government Expenditure

INF= Inflation rate

GDEF=Government Deficit

GTAX= Government Taxes

UNEMP= Unemployment rate

αo= the constant or the intercept

$\alpha_1 - \alpha_{4=}$ the coefficients of the explanatory variables

U= Stochastic error term

The equations helped us to ascertain the relationship between government deficit (GDEF) and macroeconomic performance in Nigeria within the period under review.

Presentation and Discussion of Results
Table 1 Result Summary
Modeling Gdp (economic growth) by OLS

Variables	Coefficients	SE	t-Value	Part $R\hat{Y}$
Constant	-42619	79169.	-0.538	0.0106
DGEXP	2.4001	0.65240	3.679	0.3339
DINF	-1285.7	5059.0	-0.254	0.0024
DGDEF	-2.1223	1.1052	-1.920	0.1202
DDGTAX	0.50572	0.15519	3.259	0.2823
DUNEMP	-0.45828	0.31697	-2.550	0.1941

R^2 = 0.781366, DW= 2.22, F-Stat = 19.299

The result of the estimation of the relationship between government deficit and macroeconomic performance in Nigeria within the period under consideration are as shown above. In addition to this model a causality model that shows the nature of causality between fiscal deficit and individual macroeconomic variable will be shown in the next section. In the subsections that follow, we looked at the relationship between economic growth/macroeconomic performance proxy by GDP and government deficit and other macroeconomic variables.

Government Expenditure

The coefficient of GEXP is positive, implying that there is positive relationship between GEXP and GDP. A unit increase in GEXP will cause GDP to increase by 2.4001 units. This is explained by the facts that increase in government spending on productive services will increase output of the nation. More so, GEXP is statistically significant as evidenced by the t-value of 3.679 which is greater than   + or -2.

Inflation

The coefficient of inflation is -1285.7; implying that a unit increase in inflation rate will decrease gross domestic product by -1285.7, this result meet our economic expectation since inflation reduces income even though it was not statistically significant as evidenced from the t-value of -0.254.

Government Deficits

Government deficits have coefficient -2.1223, this implies that an increase in Government deficits reduces gross domestic product by -2.1223. This result conform to expectation because deficit spending always decrease output following theory. However, it is statistically insignificant judging from its t-value of -1.920.

Government Tax Revenue

Government tax revenue coefficient is positive suggesting that increase in tax revenue will increases gross domestic product. Holding other variables constant, a unit increases in tax revenue increase gross domestic product by 0.50572.The result conform to theory because when government tax revenue increase it will also increase its expenditures and thereby impact on economic growth. Interestingly, it is statistically significant judging from the t-value of 3.259.

Unemployment

Unemployment has a coefficient of -0.45828. This negative coefficient depicts an inverse relationship between unemployment and economic growth. This implies that as unemployment increases in an economy, there is a decrease in the growth of the economy. From the result in Table1, it is shown that a unit increase in the unemployment will lead to approximately 0.46 units decrease in economic growth of the country. This is in line with the apriori expectation or the dictates of economic theory which says that as unemployment increases, there will be reduction in the productive capacity of the economy because some productive resources are not being put to optimum use.

Coefficient of determination R^2

The coefficient of determination R^2 which is 0.781366, show that the explanatory variables explained 78% of the total variation in the dependent variable

The reported Dubin Watson (DW) statistics is 2.22 indicating that there is slight negative autocorrelation among the variables.

Ramsey Test of model adequacy

We also conducted Ramsey test of model adequacy so as to find out if the set of data actually fit in properly into the model and also to see if the model is adequate for our analysis

Hypothesis formulation
H0:   the model is well specify
H1:   there is misspecification of model

Decision Rule
If F tabulated > F calculated, we accept H0
$F_{(5, 27)} = 19.299$
F table = 2.57
Since the F tabulated is greater than the F calculated we accept H0 and reject H1, we concluded that the model is good and well specified.

Normality Test
We adopted the Jacque- Bera test of normality
Hypothesis: Test
H_0: $\sigma_1 = 0$ (the error term follows a normal distributed)
Against:
H_1: $\sigma_1 \neq 0$ (the error term does not follow a normal distributed)
At $\alpha = 5\%$ with 2 degree of freedom.
Test statistics:

Decision Rule:
Reject H_0 if Jarque-Bera value greater than the chi square table at 2 degree of freedom   and accept H_0 if otherwise.
From the result obtained form Jarque-Bera (JB) Test of Normality, JB = 25.111 which is shown in the appendix, and from chi-square table χ^2_{tab} =5.99147. Therefore, since χ^2_{cal} =25.111 > $\chi^{2(0.05)}_{tab}$ = 5.99147 at 5% level of significance, we accept H_0 and conclude that the error term is not normally distributed.

Test of multicollinearity
Correlation matrix table was adopted in carrying out the multicollinearity test
Table 2 Correlation matrix

Variables	**GDEF**	**GDP**	**GTAX**	INF	UNEM	GEXP
INF	-0.1237		0.3087	1.0000	0.3862	
GDEF	1.0000	0.7645				
GDP	0.3374	1.0000				
GTAX	0.4176	0.7798	1.0000			
INF	-0.1237	0.2902	0.3087	1.0000	0.3862	
UNEM	0.6651	0.6523	0.6866	0.3573	1.0000	
GEXP	-0.2879	-0.2275	-0.3482	0.6783	-0.3563	1.0000

From the table 2 above it can be seen that the correlation between inflation and government deficit is -0.1237 while the correlation between government deficit and economic growth proxy by GDP is 0.3374. In the same vein, the correlation between government tax and government deficit is 0.4176 while the correlation between government tax and GDP is 0.7798.Inflation and GDP have a positive correlation of 0.2902 while inflation and government tax have a positive correlation of 0.3087 and inflation and unemployment have a positive correlation of 0.3862. The correlation between unemployment and Government deficit is 0.6651 while the correlation between unemployment and GDP is 0.6523 and the correlation between unemployment and government tax is 0.6866. In the same vein, unemployment and inflation have a positive correlation of 0.3573. Government expenditure has a negative correlation of 0.2879 with government deficit while the correlation between government expenditure and GDP is -0.2275. Government expenditure and government tax have a negative correlation of 0.3482 while the correlation between government expenditure and unemployment from the result is -0.3563.

Decision Rule: If the pair –wise or zero – order correlation coefficient between two explanatory variables is high, say, in excess of 0.8, then multicollinearity is a serious problem (Gujarati, 2004: 359). From the correlation matrix table, none of the variables have correlation coefficient in excess of 0.8. Therefore given the rule of thumb as specified by Gujarati (2004) we can say that there is no multicollinearity or at the best there is no much problem of multicollinearity among the variables under study.

Table 3 Modeling GDEF (Government Deficit) by OLS

Variables	Coefficients	SE	t-value	Part $R\hat{Y}$
Constant	6739.4	15633	0.431	0.0141
DGEXP	0.3107	2.4030	0.1290	0.0011
DINF	-149.86	537.30	-0.279	0.0059
DDGDP	-0.10173	0.0193	-5.262	0.6805
DDGTAX	-0.8307	0.5465	-1.5200	0.1509
DUNEMP	0.9055	0.1793	5.0490	0.6623

R^2=0.5618 DW= 1.98, F-Stat = 17.856

The result in Table 3 showed that as government expenditure increases fiscal deficit also increases. For instance, within the period under review a unit increase in government expenditure leads to approximately 0.31 unit increase in government deficit though this variable was not statistically significant. This agrees with the trend in some developing countries where there is usually excess of expenditure over revenue because of the barrage of economic and social problems facing them. Increase in inflation during this period led to decrease in government deficit, showing that as inflation increases the magnitude of government deficit decreases. This relationship disagrees with existing findings because increase in inflation is supposed to increase fiscal deficits. It is also possible that within this period government made wise or prudent expenditure thereby making some proactive expenditure. Increase in the gross domestic product decreased government deficit within the period under study and also statistically significant. This is in line with economic postulations because while huge fiscal deficit leads to high government borrowing, increase in economic growth will free funds to be used for productivity in the industries thereby reducing deficit (deficit which could have pre-empts fund meant for industrial productivity).

The result further showed that unemployment has high positive impact on government deficit within the period of study. The result showed that a unit increase in unemployment increases fiscal deficit by as much as 0.9 units. This is statistically significant. However, the result showed that an increase in government tax decreases government deficit. For instance, a unit increase in government tax will lead to a 0.8 units decrease in fiscal deficit within this period. Although this result is not significant, it tends to show that government properly utilizes the revenue realized from tax to dampen the deficit during this period.

CAUSALITY RESULT

Table 4 Causality Model: GDP, GDEF,GEXP,INF,GTAX,UNEMP

Pairwise Granger Causality Tests for Adding GDEF to other Macroeconomic variables

Null hypothesis	Lags	Obs	F-Statistic	Probability
GDEF does not Granger Cause GDP	2	28	14.337	0.0014**
GDEF does not Granger Cause GEXP	2	28	0.8894	0.4829
GDEF does not Granger Cause GTAX	2	28	9.8881	0.0046**
GDEF does not Granger Cause UNEMP	2	28	11.6916	0.0010**
GDEF does not Granger Cause INF	2	28	3.0372	0.0855

**Null Hypothesis rejected at 0.05% level of significance

Pairwise Granger Causality Tests for Adding other Macroeconomic variables to GDEF

Null hypothesis	Lags	Obs	F-Statistic	Probability
GDP does not Granger Cause GDEF	2	28	30.252	0.0000**
GEXP does not Granger Cause GDEF	2	28	0.2530	0.8573
GTAX does not Granger Cause GDEF	2	28	17.4245	0.0046**
UNEMP does not Granger Cause GDEF	2	28	15.322	0.0007**
GDEF does not Granger Cause INF	2	28	3.0731	0.0834

**Null Hypothesis rejected at 0.05% level of significance

This section looked at the direction of causality between government deficit and the macroeconomic variables used in this study. This becomes necessary because of the strong contention in economic circle that in some cases an increase in one variable may lead to an increase in another variable but actually there may be no causality relationship between them. The pair wise Granger Causality Test shown in table 4 showed that bilateral relationship exists between government deficit and gross domestic product, government tax, and unemployment while an independent relationship exists between government deficit and government expenditure, and inflation. This means that government deficit causes economic growth, government tax, and unemployment while these variables in turn cause government deficit. On the other hand, the independent relationship means that neither did government deficit cause expenditure and inflation nor did the two variables caused government deficit within the period of study.

Conclusion and Recommendation

The study employed the ordinary least square (OLS) in evaluating the relationship between fiscal deficits and macroeconomic performance in Nigeria over the period of 1980-2010. Preliminary test of stationarity and co integration of variables using the Augmented Dickey Fuller (ADF) test and the co integration test using the Engle Granger procedure were conducted respectively. The

respective test shows that INF, GEXP, UNEMP, and GDEF were stationary at first differencing. While GTAX and GDP were stationary at second differencing, the accompany co integration test provided no evidence of co integration among the variables. This conditions warrant us to proceed to estimating the model in their order of integration for the analysis.

However, the empirical findings show that fiscal deficits even though met the economic a prior in terms of its negative coefficients yet, did not significantly affect macroeconomic output within the period of study. This result suggests that fiscal deficits do not contribute significantly to the overall performance of the economy. This finding reinforced the argument of Anne (1994) that the restoration of high economic growth will be difficult to achieve without a significant and sustainable reduction in the fiscal deficits.

Implications of Result
There is the need to emphasis on the mode of financing deficit and the direction of such deficit spending. In Nigeria, deficits are largely financed by the CBN, a financing channel inimical to the healthy performances of the macroeconomic variables of economy. In the words of Prof C.C. Soludo the then Central Bank of Nigeria "we are trying to achieve a tightening monetary policy (single digit) and ensuring we do not allow unnecessary deficit financing by the government which has been the bane of our economy in the past." "We have been trying to put this in place by making the government understand the implications of deficit financing, especially when it is financed by high powered money by the Central Bank. And of course, while we are not insisting that the government should not have a deficit, we are saying that the deficit should not be financed from the CBN resources, because this in itself is inflationary". Although, fiscal deficits can be also financed through external borrowing and it will also lead to inflation.

However, the direction of deficit spending also calls for attention. In Nigeria, spending has been on unproductive transfer payment and extra budgeting expenses of questionable dimension that result in deficit trap. To worsen matters, self employed citizens are believed to be notorious tax evaders. More so, as the recessional state of the economy declines ability to pay taxes, Obinna (1998).

The key policy issues to economist and policy makers in Nigeria is to ascertain the cost of achieving success that results from modest increase in the GDP as a result of deficit financing. The increase in GDP could better be achieved in a milieu of participatory democracy.

In the peculiar context of the Nigeria economy with her unique economic conditions such as securing of her major revenue from crude oil export, neglect of other sectors (Agriculture), Untapped indirect taxes and tax evasion, rent-seeking attitude, etc. Government should have to adopt fiscal adjustment and policy measures that would reduce fiscal deficit (Extra budgetary expenses on wasteful public expenditure).

In totality, this study concludes that what should be of paramount concern to economists and policy makers as regards economic growth in Nigeria should not be on the level of fiscal deficits but on the source of financing such deficits; existing macroeconomic aggregate (inflation, unemployment, debt stuck, recession, propensity to import, exchange rates and so on) as well as the absorptive capacity of the economy.

Finally, the policies to tame such fiscal deficit must have inbuilt stabilizers that will not disrupt already existing economic conditions but rather increase the productive capacity of the economy in order to ensure a virile and sustainable economic growth in Nigeria.

Recommendation

The following recommendations are made based on our findings.

1   Government should minimize the level of deficit e.g by borrowing less for effective control of inflation rate in Nigeria. The need arises because increase in fiscal deficit increases money supply which negatively affects output growth

2   Government should as a matter of urgency and importance adopt fiscal management actions that aim at minimizing borrowing and capable of reducing fiscal deficits that often result in large chunk of transfer payment, and extra budgetary expenses of questionable viability. For instance, government should ensure that unjustifiable frivolous expenditure proposals do not find their way into the overall budget proposals of the government.

3   Fiscal deficit financed principally via the Central Bank and external debt with high service rate should be discouraged. The level of unproductive debt expansion is quite high. The full adverse effects are still being masked by the favourable oil prices and ensuing earnings. This growth path however, can therefore only be sustained if monetary/fiscal stance of the government reduces the growth rate of money supply in line with the growth rate of the real GDP.

4   Government must adopt fiscal adjustment mechanism that increases revenue through improved taxes rather than borrowing to finance deficit and dependence on crude oil.

5   Government has to checkmate the level of deficits for effective control of the economy to enhance sustainable economic growth in the country. This can be done by ensuring that policies to address deficit have an inbuilt ability to increase the productive capacity of the country.

References

Anyanwu John. C. (1997), "Fiscal Relations Among the Various Tiers of Government in Nigeria," Fiscal Federalism and Nigeria's Economic development: Ibadan. The Nigerian Economic Society

Central Bank of Nigeria Statistical Bulletin 2010.

Easterly, W. and Rebelo, S. (1993), 'Fiscal Policy and Economic Growth: An Empirical Investigation', *Journal of Monetary Economics*, 32: 417-458.

Egwaikhide, F.O. et al (1992); "Exchange Rate Depreciation, Budget Deficit and Inflation. The Nigeria Experiences, the AERC, Nairobi (May)

Gujarati, D (2004) "Basic Econometric" Tata McGraw Hill, Fourth edition.

Obinna, B. (2000), "Literature note on Economic Development" (Uturu: Abia state University).

Saleh, A. S. (2003), "The Budget Deficit and Economic Performance: A Survey", University of Wollongong, Economic Working Paper Series.

Soludo, C.C. (1998a) Fiscal Deficit. Exchange rates and External balance: Evidence from Nigeria: Paper accepted for publication in Africa Economy and social review. Vol. 3. No. 1-2

Sowa, N.K. (1994) Fiscal Deficit, Output Growth and Inflation Target in Ghana. World Development Vol. 22. No. 8.