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FISCAL DEFICIT AND ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

The study assessed the impact of fiscal deficit on economic growth in Nigeria from 1981 to 2018 using annual time series data. The major objective of the study was to determine the impact of fiscal deficit on economic growth in Nigeria. The study used the Autoregressive Distributed Lag (ARDL) model and the Granger Causality test to carry out its objectives. Findings from the study revealed that fiscal deficit had a negative impact on economic growth in Nigeria over the study period. The result of the Bound test confirmed the presence of co-integrating relationship between fiscal deficit and economic growth. The Granger causality test revealed that fiscal deficit does not cause economic growth and vice versa. To reverse the negative impact of fiscal deficit on the economy, the government needs to reassert control over expenditures by implementing a credible programme of fiscal deficit reduction that would keep government spending at sustainable limit while budget deficit amounts should be used more for capital formation purposes.

Keywords: Fiscal Deficit, Economic Growth, Autoregressive Distributed Lag Model (ARDL) Bound Test, Granger Causality Test.

1.0 INTRODUCTION

Fiscal sustainability has in the recent time become an important component of macroeconomic health analysis of countries. This is so because the implementation of government programmes should not threaten the solvency of a country now or in the future. According to Molefe and Maredza (2017), in most African countries and other emerging economies, high budget deficits are at the centre of macroeconomic adjustments due to the developing nature of their economies. Chronic government deficits and escalating government debt have become major concerns.
Nigeria, like other developing countries has experienced deficits over several decades. Expenditures in the country adjusted to changes in domestic price level faster than did revenues, and so government revenues persistently lagged behind expenditures, making deficit a recurring feature of government's fiscal operations (Okpanachi, 2004; Godwin & Clement, 2016).

Contemporary debates on the impact of fiscal deficit centre on whether it has a positive impact, negative impact, or no impact on the economy as argued by the Keynesians, Neoclassicals and the Ricardians respectively. Among the mainstream analytical perspectives, the Neoclassical view considers fiscal deficits detrimental to investment and growth, while in the Keynesian paradigm, it constitutes a key policy prescription. Theorists persuaded by the Ricardian equivalence assert that deficits do not really matter except for smoothening the adjustment to expenditure or revenue shocks. While the Neo-classical and Ricardian schools focus on the long-run, the Keynesian view emphasizes the short-run effect.

For over three decades (1981 to 2018), Nigeria's fiscal policy has been expansionary, resulting in deficits in all the years with the exception of 1995 and 1996. Government budget in Nigeria averaged -2.85 per cent of GDP from 1981 to 2017, reaching an all-time high of 0.80 per cent of GDP in 1996 and a record low of -6.70 per cent of GDP in 1990 (Trading Economics, 2018). In spite of the numerous measures and the various attempts to widen the tax base and increase revenue over the years in Nigeria, fiscal deficits according to the CBN (2017) continues to grow; it grew from N3.90 billion in 1981 to N35.76 billion in 1990, it further increased to N103.78, N1105.40, N1557.79, N2208.22 and N3679.50 billion between 2000, 2010, 2015, 2016 and 2017 respectively. These high fiscal deficit levels could lead to macroeconomic instability.

Although, government has to incur deficits to finance its revenue and expenditure mismatches and also to finance investments, the problem arises when the deficit level becomes too high and chronic. The ill-effects of high deficits are linked to the way they are financed and how it is used. The deficits can be financed through domestic borrowing, foreign borrowing or by printing money. Excessive use of any particular mode of financing of the deficits has adverse macro-economic consequences, for instance, seigniorage financing of deficits can create inflationary pressures in the economy, bond financing of deficits can lead to a rise in interest rates and in turn can crowd out private investment, and the external financing of fiscal deficit can spill over to balance of payment and exchange rate crises and in turn debt spiraling.

Whether deficit spending is seen as a deliberate policy position or as a result of government fiscal operations in which deficits are driven by external shocks and other domestic macro-economic conditions, there is wide spread consensus on the need to reduce their size wherever they are found to be persistently large, there is however far less agreement on precisely what course of action to follow (Awe & Funlayo, 2015). Some scholars believe that the goal of governments ought to be total elimination of deficits while others think otherwise. On the one hand, deficit is believed to trigger high tax rates, which can decrease productivity and deter private investment. On the other, deficit spending is assumed to complement business investment and stimulate economic productivity.

The central problem of this study stems from the fact that chronic government deficits and escalating government debt in Nigeria have become a major concern. The strong association

between government fiscal activities and the performance or non-performance of the economy is not in doubt (Idris & Bakar, 2017). In spite of government's efforts at devising policy measures aimed at reducing government deficit, deficits have persisted in the nation's economy with its adverse effect being perceived on key macro-economic variable such as the depletion of foreign reserve and debt burden assuming worrisome heights (Awujola, Obumneke & Oniore, 2014).
The existence and persistent growth of government's deficit in Nigeria expose the economy to various vulnerabilities from both within and outside the economy. In spite of the numerous austerity measures and the various attempts to widen the tax base over the years, the deficits continue to grow. The high deficit implies that the government would continue to increase its borrowing and hence the debt levels would continue to grow. Accumulation of public debt levels leads to the widening of the current account deficits. As the current account deficit worsens, it turns into depreciation of the domestic currency which impacts the economy negatively due to the inflationary pressures and thus causes increase in interest rates. As a consequence, the cost of borrowing goes up for the government and this exerts pressure on the government budget due to high debt service and thus the persistent high deficit levels leading to debt crises. The central problem of this study is on the fact that deficit has persistently been on the rise in Nigeria, but despite this, the GDP growth rate has been poor.

The major objective of the study is to assess the impact of fiscal deficit on economic growth in Nigeria.

2.0 LITERATURE REVIEW

2.1 Theoretical Literature

The Neoclassical 'Crowding out Effect'- The Neoclassical view considers fiscal deficits as detrimental to investment and growth as they crowd out private investment. Assuming tax-financed government expenditures, shifting taxes to future generations will lead to deficits increasing current consumption (Bernheim, 1989). Assuming full employment of resources, the neoclassical assert that increased consumption implies a decrease in savings. The result is a rise in real interest rates, and higher interest rates, in turn, crowd out private investment hence its reduction implies retardation in economic growth.

The Keynesian 'Crowding in Effect' - Keynes' view contradicted the Neoclassical proposition of crowding out of private investment. He propounded a counter-argument in support of crowding-in of private investment by making reference to the expansionary effects of fiscal deficits. Assuming underemployment of resources, the Keynesians argue that fiscal deficits result in an increase in domestic production, which makes private investors more optimistic about the future course of the economy resulting in them investing more - that is crowding-in effect (Bernhein, 1989). According to Saleh (2003), higher public spending may raise the marginal productivity of private capital thereby crowding-in private investment. He accorded

that public capital expenditure such as infrastructure capital like highways, airports, water systems and sewers are likely to bear a complementary relationship with private capital. To this, he concluded that if public capital is complementary to private capital, then investment in public capital will crowd in private investment by raising the return thereof, this will stimulate economic growth.

The Ricardian Equivalence – This theory posits that regardless of how it is financed, a fiscal deficit would have no impact on private consumption or income (Dalyop 2010). In other words, a fiscal deficit does not spur consumption growth, and thus, does not have an expansionary effect on output. This is because when a deficit is implemented, individuals increase their current savings in expectation of increased tax burdens in the future (Corden, 1991). The conclusion of the Ricardian-equivalence is that a fiscal deficit will not generate a positive effect on economic growth.

This school of thought is only applicable under extreme assumptions. The assumptions include the following:

i. The government budget constraint is internalized by consumers who are indifferent to the sources of government finance;
ii. Capital markets are perfect, that is, the interest rate for borrowers and lenders should be the same;
iii. There are no distortions in taxes.

Basically, under this theory, it is believed that there are generational inter-linkages bound by generosity, so much so that the current generation is concerned about the plight and welfare of future generations (Bernheim, 1989). The theorem suggests that fiscal deficits and taxation have equivalent effects on the economy. A decrease in government saving in the form of a current fiscal deficit leads to an offsetting increase in desired private saving and hence to no change in desired national saving. Since desired national saving does not change, the real interest rate does not have to rise in a closed economy to maintain balance between national saving and investment demand. Hence, there is no effect on investment and no burden of public debt according to Feldstein (1980). In summary fiscal deficits have neutral effects on economic growth according to the Ricardian Equivalence.

Empirical Literature

The study reviewed several related literatures. While some literatures showed that the use of deficit financing had a positive impact on the economy, others had a negative and neutral impact in line with the theories guiding the study. In particular, Akinola (2017) examined the impact of budget deficit on the economic performance of Nigeria between 1970 and 2013 using annual time series data. The study used the Ordinary Least Square (OLS) multiple regression analysis technique to carry out its empirical analysis. Variables used in the study were economic performance proxied by per capita income, budget deficit, external reserves, inflation rate and

interest rate. Findings revealed that budget deficit had a mild positive impact on economic growth in the country. It indicated that that budget deficit increased economic growth by 2%.

In a related study, God's-time, Nchege and Anthony (2015) examined the responses of budget deficits to economic growth in Nigeria from 1970 to 2012. In contrast to Akinola (2017), their study employed the Vector Auto Regression (VAR) analysis to carry out its empirical analysis. Variables used in the study were fiscal deficit, Gross Domestic Product, interest rate, money supply, and private investment. Although budget deficit responds with a positive movement for every one standard deviation shock to real gross domestic product at the early stage, subsequent positive shocks or variations in real gross domestic product elicit a negative response from the budget balance right from the 10^{th} period down to the 172^{nd} period. Budget deficit showed signs of decline at the initial stage in response to a positive innovation in real interest rate, however, this response normalized to a positive one as from the 11^{th} period and remained so all through the period under review. As more money is released into the economy, budget deficit responds to shocks in money supply with a continuous decline all through the periods under review.

While differing from the studies by Akinola (2017), God's-time, Nchege and Anthony (2015) that was centered on budget deficit, Edame and Okoi (2015) focused on fiscal deficit by examining the relative impact of fiscal deficits (*FSD*) on economic growth in Nigeria during the military and democratic regimes that is 1985-1998 and 1999-2013 respectively. The study employed the Two Stage Least Square in its empirical analysis. Findings revealed that there is a difference between the growth-impact of *FSD* in the two regimes. In particular, the study found that *FSD*s had a significant growth impact during the military regime, while it did not have a significant impact on economic growth during the democratic regime. On the other hand, the results indicated that the interest rate did not have a significant growth impact during both regimes, while the gross fixed capital formation had a significant growth impact during both regimes.

In a similar fiscal deficit based Nigeria study like that of Edame and Okoi (2015), Oyeleke and Ajilore (2014) investigated the sustainability of fiscal deficit in Nigeria over the period of 1980 to 2010. The study however used the VECM approach and found that fiscal deficit was weakly sustainable in the economy of Nigeria. Similarly, Maji and Achegbulu (2012) investigated the impact of fiscal deficits on economic growth in Nigeria from 1970 to 2009. But however used the OLS multiple regression technique to assess the relationship between the variables of gross domestic product, government deficits, and broad money supply. Findings from the study showed that for the period under investigation fiscal deficit positively affected economic growth in Nigeria, and money supply is significant in explaining economic growth variations in Nigeria. Oladipo and Ajisafe (2015) in a budget deficit based study, investigated the dynamic interaction among budget deficit, economic growth and poverty level in Nigeria from 1981 to 2010. The study used the Vector Autoregression (VAR) technique to determine the interactive effects among the three variables. The result showed that a shock to budget deficit brought about a

negative response in economic growth at the initial period but became positive over time. Also, shock from budget deficit produced a negative response on real consumption expenditure per capita, but however, it became positive over time.

Similarly, Aworinde (2013) assessed budget deficits and economic performance in Nigeria, but it however differed from other budget deficit base studies by using quarterly data between the period of 1980Q1 to 2009Q4. It also uniquely used the Autoregressive Distributed Lag (ARDL) model in its analysis. Variables used for the analysis were fiscal deficit, the current account balance, real exchange rate and the real interest rate. Findings from the study led to the conclusion that large fiscal deficits was the cause of current account deficits in the country, and that deficits are inflationary.

Also, Ojo (2012) investigated government's deficit financing on Nigeria's economic growth between 1970 and 2010. In contrast to Aworinde (2013), the analysis was carried out using the econometric technique of VAR analysis. Variables included for the analysis were the gross domestic product, budget deficit, inflation rate, gross capital formation, and real interest rate. Findings from the VAR result showed that deficit financing had not achieved the desired results in the Nigerian economy as revealed by the negative impact of deficit financing on the economic growth of the country.

The study also reviewed some related studies from other countries. Exploring the case of South Africa, Molefe and Maredza (2017) analyzed the impact of budget deficit on South Africa's economic growth spanning the period of 1985 to 2015. The Vector Error Correction Model (VECM) was used to estimate the long-run equation and also used to measure the correction from disequilibrium using six variables of real GDP, budget deficit, real interest rate, labour force, gross fixed capital formation and unemployment. Findings from the study revealed that budget deficit and economic growth have an inverse relationship. The study concluded that high levels of budget deficit in South Africa have detrimental effects on economic growth. The coefficient of the speed of adjustment revealed that about 29 per cent of variation in GDP from its equilibrium level is corrected annually in the model.

Similarly, Nkrumah, Orkoh, and Owusu (2016) using Ghana as a case study, combined the Autoregressive Distributed Lag (ARDL) approach with trend analysis to assess the relationship between Ghana's budget deficit and economic growth between 2000 and 2015 using quarterly data. The trend analysis revealed that since the year 2000, years of high budget deficit were usually followed by years of low growth and vice versa. The empirical results showed a significantly negative impact of budget deficits on economic growth. It revealed that, a unit increase in budget deficit in the long-run would lead to a 3 per cent decrease in real GDP, holding all other factors constant. The results confirmed the Neoclassical proposition that high budget deficit does not necessarily translate into economic growth.

Assessing the impact of fiscal deficit on economic growth in the Indian context, Bhoir and Dayre (2015) used annual time series data covering the period from 1991 to 2014. The study used the OLS Multiple regression technique to carry out the analysis. The study found that there was no significant relationship between fiscal deficit and economic growth in the Indian economy for the period of this study. It thus suggested that the Indian government should focus on human development indicators such as health, education and infrastructural development so that it will enhance the productivity of human and physical capital, which will in the long-run increase the per capita income of the Indian people.

The empirical review revealed that most of the empirical literatures particularly the Nigerian specific studies assessed primary deficit, which only dwells on the difference between current government spending on goods and services and total current revenue from all types of taxes net of transfer payments. This study however assesses total deficit which comprisesthe primary deficit in addition to interest payments on the debt. Although the works of Edame and Okoi (2015), Oyeleke and Ajilore (2014), and Maji and Achegbulu (2012), were Nigeria fiscal deficit based studies, their empirical analysis ended in 2009 with the exception of Edame and Okoi (2015) that extended its analysis to 2013 but it however used the multiple OLS regression analysis. This study unlike other reviewed Nigeria fiscal deficit based studies that used the multiple OLS technique extended its analysis to 2017 and employed the ARDL technique which incorporates both long-run and the short-run dynamics to fully capture the impact of fiscal deficit on economic growth.

Theoretical Framework

This study used the Keynesian theory as theoretical framework. The Keynesian theory first allows for the possibility that some economic resources are unemployed. Second, it presupposes the existence of a large number of myopic liquidity constrained individuals. This second assumption guarantees that aggregate consumption is very sensitive to changes in disposable income. The Keynesian economists propose a positive relationship between budget deficits and macroeconomic variables. It holds that if desired spending exceeds revenue, the government finances the difference by borrowing. They argue that usually budget deficits result in an increase in domestic production, increases aggregate demand, increases savings and private investment at any given level of interest rate.

Assuming underemployment of resources, the Keynesians argue that fiscal deficit result in an increase in domestic production, which makes private investors more optimistic about the future course of the economy resulting in them investing more; 'crowding in' effect (Bernhein, 1989). According to Saleh (2003), higher public spending may raise the marginal productivity of private capital thereby 'crowding in' private investment. He accorded that public capital expenditure such as infrastructure capital like highways, airports, water systems and sewers are likely to bear a complementary relationship with private capital. To this, he concluded that if public capital is complementary to private capital, then investment in public capital will crowd in private

investment by raising the return thereof, this will stimulate economic growth. To model the effect of fiscal deficit on economic growth in Nigeria, this study makes use of the Cobb-Douglas (C-D) production function widely used to represent the technological relationship between the amounts of two or more inputs and the amount of output that can be produced by those inputs. In its most standard form for production of a single good with two factors, the function is given as Equation [1];

[1] $Y = AL^{\beta} K^{\alpha}$

where, Y represents output, K and L stand for capital and labor, A is the efficiency parameter while α and β are the output elasticities of capital and labor, respectively. Following Durlauf and Blume (2016), in its generalized form, the C-D function models more than two goods. As such, the C-D function may be written as Equation [2];

[2] $Y = A \prod_{i=1}^{L} x_i^{\lambda_i}, \qquad x = (x_1, \cdots\cdots, x_L).$

where, A is an efficiency parameter, L is the total number of inputs, $x_1 \cdots\cdots x_L$ are the (non-negative) quantities of inputs used in production and λ_i is an elasticity parameter of input *i.* In its various representations of the production function, the C-D function can be estimated as a linear relationship using Equation [3];

[3] $In(Y) = a_0 + \sum_i a_i In(x_i)$

Where, Y is output, x_i are the inputs, a_0 is the intercept and a_i are the model coefficients. To determine the impact of fiscal deficit on economic growth, this study following the works of Oladipo and Ajisafe (2015) and Edame and Okoi (2015), modifies Equation [3] to model output(Y) as a function of fiscal deficit (*FD*), government expenditure (*GEX*), gross capital formation (*GCF*), and interest rate (*INT*)

RESEARCH METHODOLOGY

Type and Source of Data

Secondary data was employed for the study. It used annual time series data covering the period of 1981 to 2018. The base year from 1981 was chosen because the period marked an upward rise in government fiscal deficit, and also, the economic crises of the period which necessitated the structural adjustment process of the mid 1980's saw an expansion of government's expenditure and also deficit levels. The terminal year of 2018 was chosen as the period is recent enough to capture the relationship. The data on economic growth (proxied by gross domestic product (GDP)), fiscal deficit, government expenditure and interest rate were all gotten from the annual CBN statistical bulletin.

Method of Analysis

To carry out the objective of this study the Autoregressive Distributed Lag (ARDL) model and its Bound test were used respectively. The ARDL model proposed by Pesaran, Shin and Smith (2001) is autoregressive in the sense that the dependent variable $\{Y_t\}$ is explained by its own lagged $\{Y_{t-1}\}$ and also having a distributive lag component in the form of successive lag $\{x_t\}$ independent variable (Giles, 2013). The model enjoys several advantages over conventional cointegration techniques. First, ARDL is superior to conventional cointegration techniques when it is used on a small sample size. Second, it allows both short-run and long-run relation to be tested simultaneously. Third, the approach provides unbiased estimates for long-run and valid *t* test when some regressors are endogenous. And fourth, the variables are tested irrespective of whether a variable is difference of order zero or order one (Srinivasan & Kalaivani, 2012).
The Granger causality test was also employed to determine the causal relationship between fiscal deficit and economic growth. Causality in the sense defined by Granger (1969) is inferred when lagged values of a variable, say X_t, have explanatory power in a regression of a variable Y_t.

Model Specification

To carry out the analysis, the study following the works of Oladipo and Ajisafe (2015) and Edame and Okoi (2015) models economic growth (*GDP*) as a function of fiscal deficit (*FD*), government expenditure (*GEX*), and interest rate (*INT*). The functional form of the model is given in Equation[4]:
[4] GDP=f(FD,GEX,INT)
The econometrics form of the model is given as:
[5] $LnGDP = \alpha_0 + \alpha_1 LnFD + \alpha_2 LnGEX + \alpha_3 LnINT + \varepsilon_t$

Apriori Expectation: *LnFD* & *LnGEX* >*0,* while *LnINT* < *0*
where, α_0 is the intercept; α_1, α_2 and α_3 are the coefficients of the variables; ε_t represents the error term, *LnGDP* represents the natural log of gross domestic product, *LnFD* is the natural log of fiscal, *LnGEX* represents the natural log of government expenditure, while *LnINT* strands for the natural log of interest rate.

Estimation Procedure
Unit Root Test

The study used the Phillips-Perron (PP) unit root test as a pre-estimation test to ascertain the unit root properties of the time series data employed in the study. The PP test builds on the Dickey-Fuller test, that is, the null of unit root exists: $H_0 = \alpha = 0$ but it proposes a nonparametric

approach. Therefore, it is applicable on wider categories of time series, including ARMA models and moving average models (Phillips & Perron, 1988).

[6] $\Delta Y_t = \alpha Y_{t-1} + u_t$

Where, Y_t is a time series and u_t is a sequence of innovations. While the ADF test addresses the problem of a higher order of autocorrelation by adding lagged difference terms of the dependent variable, ΔY_{t-1} as regressors in the test equation, the PP test modifies the test statistic of the α parameter, so serial correlation does not affect the asymptotic distribution of the test statistic (Waheed, Alam & Ghauri, 2006).

The ARDL Approach to Co-integration

The ARDL method involves four steps. The first step after stationarity test is to examine the presence of cointegration using the bounds testing procedure (Pesaran and Pesaran, 1997; Pesaran, Shin and Smith, 2001). The second step is to estimate the coefficient of the long-run relationships identified in the next step. Having found long-run relationships among the variables, in the next step the long-run relationship is estimated using an appropriate lag selection criterion based on either Akaike Information Criterion (AIC), Schwarz Information Criterion (SBC) or the log-likelihood ratio test (LR) for the ARDL model as only an appropriate lag selection criterion will be able to identify the true dynamics of the model.

The third step is to estimate the short-run dynamic coefficients. The fourth stage involves testing for the stability of the model, by using the CUSUM and CUSUMSQ tests. From the second stage, not only are estimates of long-run elasticities ($\delta_1 - \delta_4$) obtained, but also the CUSUM and CUSUMSQ tests are applied to the residuals of Equation [4] to test for stability of long-run elasticities by taking into account the short-run dynamics. The ARDL model is written as:

[7] $Y_t = \alpha_0 + \phi_t Y_{t-1} + \beta_t X_{t-1} + \varepsilon_t$

where, Y_{t-1} and X_{t-1} are time series variables, ε_t is the vector of the stochastic error term. Generally, the model can also be defined as ARDL (p, q) the p and q are lag of the parameter which forms the Equation [8];

[8] $y_t = \alpha_0 + \sum_{i=0}^{p} \phi_i y_{t-1} + \sum_{j=0}^{q} \beta_j x_{t-1} + \varepsilon_t$

In view of the above explanation, the ARDL model used in this study is presented in the Equation [9]:

[9] $\Delta LnGDP_t = \alpha_0 + \sum_{t=0}^{p} \phi_1 \Delta LnGDP_{t-1} + \sum_{t=0}^{p} \phi_2 \Delta LnFD_{t-1} + \sum_{t=0}^{p} \phi_3 \Delta LnGEX_{t-1} + \sum_{t=0}^{p} \phi_4 \Delta INT_{t-1}$
$+ \alpha_1 LnGDP_{t-1} + \alpha_2 LnFD_{t-1} + \alpha_3 LnGEX_{t-1} + \alpha_4 LnINT_{t-1} + \varepsilon_t$

Where, α_0 is intercept, *t* is the time dimension while Δ is difference operator and ε_t is the error term. The long-run co-integration is estimated using Equation [10]:

$$[10]\quad \Delta LnGDP_t = \alpha_0 + \sum_{t=0}^{p} \phi_1 \Delta LnGDP_{t-1} + \sum_{t=0}^{p} \phi_2 \Delta LnFD_{t-1} + \sum_{t=0}^{p} \phi_3 \Delta LnGEX_{t-1} + \sum_{t=0}^{p} \phi_4 \Delta LnINT_{t-1} + \varepsilon_t$$

The selection of ARDL maximum lag (p q) is based on the examination of all the selection criteria. The study derived the short-run dynamic parameter from Error Correction Model (ECM) estimation, associated with the long-run estimate.

$$[11]\quad \Delta LnGDP_t = \alpha_0 + \sum_{t=0}^{p} \phi_1 \Delta LnGDP_{t-1} + \sum_{t=0}^{p} \phi_2 \Delta LnFD_{t-1} + \sum_{t=0}^{p} \phi_3 \Delta LnGEX_{t-1} + \sum_{t=0}^{p} \phi_4 \Delta LnINT_{t-1} + \delta ECM_{t-1} + \varepsilon_t$$

In the Equation [8] ϕ_1, ϕ_2, ϕ_3 and ϕ_4 are short-run dynamic coefficients converging to long-run equilibrium while ECT_{t-1} is the speed of adjustment parameter and error correction model originated from the estimated equilibrium relationship of Equation [11].

Bound Test- The Bound test normally models the ARDL equation by the use of least square procedure, in order to investigate the existence of long-run relationship among the variables, the *F*-statistics test is conducted for the joint significance of the coefficient of lagged variables, $H_0: \phi_1 = \phi_2 = \phi_3 = \phi_4 = 0$ against the alternative $H_0: \phi_1 \neq \phi_2 \neq \phi_3 \neq \phi_4 \neq 0$. The calculated F-statistics is compared to the critical value. If the *F*-statistics value lies above the bound of critical value, the null hypothesis is rejected. If the *F*-statistic value falls below the lower bound of critical value, the null hypotheses cannot be rejected that is, there is no long-run relationship among the variables, and however, if the *F*-statistic value lies within the bound test the result is inconclusive.

The Causality Test

The Granger causality test is employed here. Causality in the sense defined by Granger (1969) is inferred when lagged values of a variable, say X_t, have explanatory power in a regression of a variable Y_t. The basic empirical question in this study is whether fiscal deficit causes growth in Nigeria. Theoretically, if the current or lagged terms of a variable, for example X_t, determine another variable, for example Y_t, then there exists a granger causality relationship between X_t and Y_t, in which Y_t is granger caused by X_t.

Residual Diagnostic Tests

In order to validate the results of ARDL model the Breusch-Godfrey serial correlation LM test tests for serial correlation; Jarque-Bera normality test is used to determine the distribution of the residuals in the model; while the Cumulative sum of recursive residuals (CUSUM) and

Cumulative sum of squares of recursive residuals (CUSUM Square) is employed to test for stability in the model.

PRESENTATION AND ANALYSIS OF RESULT

Unit Root Test

The unit root test was first carried out to analyze the time series properties of the data employed in the study. Using the Philips-Perron (PP) method, the test revealed that the time series data of GDP, GEX and INT were all stationary at 1st difference, with the exception of FD that was stationary at levels.

Table 1: *PP Unit Root Tests Results*

Variable	Order	PP Calculated	PP Critical Value	Conclusion
GDP	At levels	-2.564644	-3.536601	1(1)
	1st difference	-3.862502	-3.540328	
FD	At levels	-4.913062	-3.548490	1(0)
GEX	At levels	-1.005171	-3.536601	1(1)
	1st difference	-7.626632	-3.540328	
INT	At levels	-2.845315	-3.536601	1(1)
	1st difference	-7.998295	-3.540328	

Conducted at the 5% PP Critical level

ARDL Optimal Model

The ARDL optimal model is presented on Table 2. As a lag selection criterion, the study depended on the automatic lag length selection test built into the E-Views 10 package.

Table 2: *Optimal ARDL Result*

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNGDP(-1)	0.749038	0.035973	20.82197	0.0000
LNFD	-0.002993	0.008065	-0.371104	0.7176
LNFD(-1)	-0.005295	0.007484	-0.707483	0.4940
LNFD(-2)	-1.85E-05	0.007359	-0.002512	0.9980
LNFD(-3)	0.005415	0.007753	0.698539	0.4993
LNFD(-4)	0.020572	0.007403	2.778784	0.0179
LNGEX	0.020329	0.031427	0.646848	0.5310
LNGEX(-1)	0.010603	0.029577	0.358476	0.7268
LNGEX(-2)	0.050027	0.035743	1.399639	0.1892
LNGEX(-3)	0.039611	0.030594	1.294707	0.2219
LNGEX(-4)	-0.054087	0.035354	-1.529855	0.1543
LNINT	-0.015779	0.037899	-0.416352	0.6852
LNINT(-1)	0.082705	0.030525	2.709405	0.0203
LNINT(-2)	-0.042011	0.029819	-1.408872	0.1865
LNINT(-3)	-0.029063	0.034878	-0.833282	0.4224
LNINT(-4)	-0.176660	0.034869	-5.066425	0.0004
C	2.687875	0.409847	6.558231	0.0000

The ARDL optimal model provides the basis through which the impact of fiscal deficit on economic growth is carried out. The optimal model also provides the basis by which the post-estimation tests are carried out for the ARDL analysis. The ARDL optimal model of (1,4,4,4) was adopted as given by the Eviews 10 statistical package. On the basis of the optimal model of (1,4,4,4), the Bound test, long and short-run tests, and the diagnostic tests of this study are carried out below.

The ARDL Bound Test

The result of the ARDL bound test which establishes the existence of co-integration in the ARDL model is presented on Table 3. The calculated F-statistics is compared to the critical value. If the *F*-statistics value lies above the bound of critical value, the null hypothesis is rejected. If the *F*-statistic value falls below the lower bound of critical value, the null hypotheses cannot be rejected that is, there is no long-run relationship among the variables, however, if the *F*-statistic value lies within the bound test the result is inconclusive.

Table 3: ARDL Bound Test Result

F-Bounds Test	**Null Hypothesis: No levels relationship**			
Test Statistic	**Value**	**Signif.**	**I(0)**	**I(1)**
F-statistic	26.60374	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

The Bounds test result showed that the F-statistics value is 26.60. This value is greater than the upper bound critical values of I(1) at all the levels of significance. This result therefore showed the existence of long-run relationship in the model, and as such the study proceeded to conduct the short-run and long-run forms of the ARDL model.

The Long-Run Estimation

The ARDL long-run estimation shows the nature and the extent of the relationship among the variables in the model. The results of the ARDL estimation for the long-run coefficients are presented on Table 4.

Table 4: *ARDL Long-run Result*

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LNFD	-0.070453	0.073543	-0.957979	0.3587
LNGEX	0.264910	0.049645	5.336055	0.0002
LNINT	-0.720463	0.209319	-3.441943	0.0055
C	10.71028	0.510145	20.99458	0.0000

The long-run coefficient of fiscal deficit (*FD*) had a negative but however insignificant impact on economic growth. Its coefficient states that *FD* reduces *GDP* by 7%. This indicates that the operation of fiscal deficit in Nigeria over the study period negatively affected economic growth. This result points to the fact that fiscal deficit operation in the country has not been channeled to productive uses in the country, as such, leading to a huge debt burden and a corresponding debt overhang annually that has negatively affected growth. This result is in line with the study by Aworinde (2013). The negative results stems from the fact that Nigeria's chronic fiscal deficit led to the accumulation of public debt levels, which also leads to the widening of the current account deficits; as the current account deficit worsens, it turns into depreciation of the domestic currency which impacts the economy negatively due to the inflationary pressures and thus causes increase in interest rates which crowds out domestic investment. As a consequence, the cost of borrowing goes up for the government and this exerts pressure on the government budget due to high debt service and thus the spiral of high deficit levels continues.

The coefficient of government expenditure (*GEX*) representing a fiscal policy variable in the model had a positive and statistically significant impact on economic growth. The coefficient indicates that government's expenditure significantly affect growth in the economy by about 26%.

The interest rate (*INT*) variable in the model representing the cost of borrowing in the model was negatively signed and also statistically significant following apriori expectation. Its coefficient states that, a unit increase in the cost of borrowing in the country reduced growth by 72%. This indicates that the cost of borrowing within the economy particularly for the operation of government's fiscal deficit retarded growth.

The Short-run Estimation

The ARDL short-run model was estimated to confirm the short-run dynamics and interactions of the parameters in the model. The result of the ARDL short-run model is presented on Table 5.

Table 5: *Short-Run Coefficient Estimates*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNFD)	-0.002993	0.005288	-0.566001	0.5828
D(LNFD(-1))	-0.025969	0.005973	-4.347479	0.0012
D(LNFD(-2))	-0.025988	0.005414	-4.800386	0.0006
D(LNFD(-3))	-0.020572	0.004346	-4.734033	0.0006
D(LNGEX)	0.020329	0.018051	1.126202	0.2841
D(LNGEX(-1))	-0.035551	0.017252	-2.060655	0.0638
D(LNGEX(-2))	0.014476	0.019632	0.737381	0.4763
D(LNGEX(-3))	0.054087	0.019832	2.727266	0.0197
D(LNINT)	-0.015779	0.022749	-0.693639	0.5023
D(LNINT(-1))	0.247735	0.030887	8.020688	0.0000
D(LNINT(-2))	0.205724	0.030065	6.842595	0.0000
D(LNINT(-3))	0.176660	0.026434	6.683081	0.0000
CointEq(-1)*	-0.250962	0.018634	-13.46808	0.0000

The error correction term (CointEq(-1)*) which shows how quickly variables adjust to shock and return to equilibrium is estimated in the short-run equation. Its estimated coefficient is -0.25 and it was highly statistically significant. This indicates that the deviation from the current economic growth path was corrected by 25% annually in the model. In line with the long-run result, fiscal deficit showed a negative relationship with economic growth in all 3 period lags and was also statistically significant. The result indicates that in the short-run fiscal deficit had a negative impact on economic growth.

Causality Estimation

To determine the causal relationship between fiscal deficit and economic growth in Nigeria, the Granger causality test is carried out as presented on Table 6.

Table 6: *Granger Causality Test Result*

Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
LNFD does not Granger Cause LNGDP	32	0.68872	0.5108
LNGDP does not Granger Cause LNFD		2.39066	0.1107

The Granger causality test was employed to determine the nature of causation between fiscal deficit and economic growth in Nigeria. The result of the Granger causality test as presented on Table 6 showed that there was no causal relationship between fiscal deficit and economic growth. This supports the ARDL conclusion that fiscal deficit does not cause growth both in the long-run and short-run.

Residual Diagnostic Tests
Serial Correlation Test Result

The Breusch-Godfrey serial correlation LM test was used to test for serial correlation as presented on Table 7. The result of the test accepted the null hypothesis of no serial correlation in the residual, because the probability of both the F-statistics and its Observed R-squared value were both greater than the 5% level. As such the ARDL model was free from the problem of serial autocorrelation.

Table 7: *Breusch-Godfrey Serial Correlation LM Test Result*

F-statistic	0.269960	Prob. F(2,21)	0.7660
Obs*R-squared	0.827177	Prob. Chi-Square(2)	0.6613

Stability Test Result

The result of the Cumulative sum of recursive residuals (CUSUM) and the Cumulative sum of squares of recursive residuals (CUSUMSQ) tests are presented on Figure 1 and Figure 2 respectively. The plots of the CUSUM and the CUSUMSQ statistic on Figures1 and 2 respectively were all within the two straight line indicating that the ARDL model was stable.

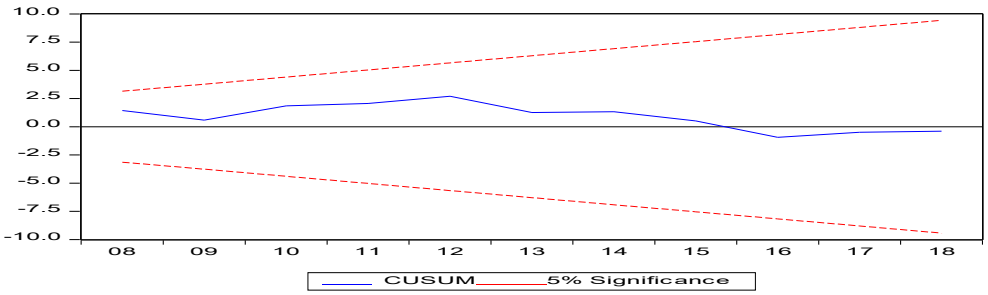

Figure 4: *CUSUM Plot*

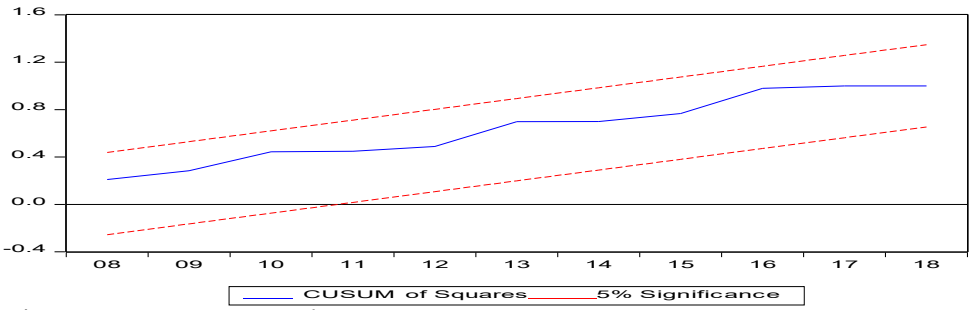

Figure 5: *CUSUMSQ Plot*

CONCLUSION AND RECOMMENDATION

Conclusion

The study concluded that fiscal deficit negatively affected the economy. The deficits of the government during the period under review were high and far from sustainable levels, resulting in huge debt burden, which was transmitted negatively to the economy. Also government's borrowing and high debt servicing over time forces the government to cut back on spending on relevant sectors of the economy.

Recommendation

To reverse the negative trend, large fiscal deficits and their financing are the major problem and source of concern for policy makers in Nigeria; as such policy measures aimed at deep budget cuts are important. Along this line there is need to trim down the size of government and carry out genuine budget monitoring to plug areas of wastages and give value for money expended. This would keep government spending at sustainable limits.
In addition, government should improve on her tax revenue generation and other sources of income in order to reduce fiscal deficit.

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