An Examination of Fiscal Deficit - Economic Growth Nexus for Nigeria using the Bound Test Approach

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Abstract
This study examined the impact of fiscal deficits on economic growth in Nigeria from 1981 to 2021 and the causality between them. The Autoregressive Distributed Lag (ARDL) model was employed to examine the nature of short-run and long-run relationships and the Granger causality test was conducted to ascertain the existence of a causal relationship between fiscal deficit (FD) and economic growth (RGDP) in Nigeria. The result showed that fiscal deficit (FD) has a positive impact on economic growth both in the short-run and the long run, in tandem with the Keynesian proposition. As for other variables included in the model, gross capital formation (GCF) and trade openness (TOP) had a positive and significant effect on economic growth (RGDP) both in the long-run and short-run. Unemployment rate (UNR), interest rate (INT) and inflation rate (INF) had a negative impact on economic growth both in the long-run and short-run. The exchange rate (EXR) exerted a positive impact, though insignificant on economic growth in the long run but in the short run, it had a negative effect. The Granger causality test result showed a unidirectional causality between real gross domestic product (RGDP) and fiscal deficit (FD); the causality flows from real GDP to fiscal deficit (FD). The study recommended that deficit spending should be properly managed and prudently utilized in the provision of critical economic and social overhead capital that would expand the productive capacity of the economy to enhance private investment and other productive activities. To minimize adverse consequences of fiscal deficit, none of the sources of deficit financing should be exploited excessively. There should be deliberate action on the part of the government to promote productivity in the country to curtail inflationary pressure.

Keywords*:* Fiscal Deficit, Economic Growth, Nigeria

Introduction

There has been a steady increase in government expenditure in many countries of the world. Hall (2010) acknowledged the steady rise in government expenditure and stressed that the increase in government spending has reached a historic high level of 40% of gross domestic product (GDP) in OECD countries and has been rising in developing countries. The increase in government expenditure is attributed to an increase in government activities and functions in the economy as postulated in Wagner's law of public expenditure. In many countries, though government revenue has grown, it has not kept pace with government expenditure. In most cases, government expenditure had outstripped revenue resulting in a fiscal deficit.

Fiscal deficit, though a powerful demand management instrument employed by policymakers to stimulate economic activity, is not without consequences. However, the adverse consequences depend on the source of financing the fiscal deficit. Generally, the fiscal deficit can be financed by withdrawing from the country's foreign reserves, through the proceeds from sales of public assets (privatization), domestic borrowing, external borrowing and printing of money (seigniorage) (Ekpo & Adaowo, 2011; Rapu et al., 2012). A notable outcome of fiscal deficit financing is the creation of public debt through domestic and external borrowing and consequently, debt service payment which divert resources from vital items of government expenditures. Darlon & Trebeschi (2006) argued that issuing more debt to finance fiscal deficits including interest payment on principal arrears can endanger the government's liquidity and solvency through debt accumulation. Excessive domestic borrowing by the government reduces loanable funds available to the private sector, raises interest rates, crowds out private investment and slows economic growth. The effects of external borrowing include current account deficit, appreciation in exchange rates and debt overhang. Fiscal deficit financed by money creation tends to hike inflationary pressure, especially when the increase in the volume of money out-matches the increase in the production of goods and services in the country.

Economists are vastly divided on the desirability and impacts of fiscal deficit on the economy. There are three schools of thought regarding the need and economic effects of budget deficits: the Keynesian, Ricardian and the Neoclassical perspectives. The Keynesian revolution, the 'unbalanced budget philosophy', initiated the relevance of budget deficit in macroeconomic management. It advocates the positive effects of fiscal deficit on the economy (Keynes, 1936). The Ricardian Equivalence Proposition (REP), in response to the Keynesian approach, assesses whether the financing of budget deficit affects real economic variables, economic growth inclusive and posits that fiscal deficit does not have a real effect on the macro-economy (Barro, 1989). The Neoclassical paradigm asserts that persistent fiscal deficits "crowd out" private capital accumulation and investment and consequently, retards economic growth (Saeed & Khan, 2012).

Despite the divergent views of economists, available statistics have shown that fiscal deficit policy has been widely adopted by many industrialized and developing countries. The OECD countries like the United States of America (USA), Japan and the United Kingdom (UK) had practised fiscal deficit policy. Similarly, there have been deficits in government fiscal operations in developing countries like India, Ghana, South Africa, Guinea-Bissau and Nigeria (Kumar & Soumya, 2010; Egwaikhide et al., 2012). In Nigeria, except for the years 1995 and 1996 when there was a surplus budget, fiscal deficits had been practised for about four decades beginning from 1980 till date and have been growing. For instance, fiscal deficit was ₦3,902.1billion in 1981, ₦22,116.1billion in 1990, and ₦133,389.3billion in 1998. In 2002, fiscal deficit was ₦301,401.6billion, ₦161,406.3billion in 2005 and ₦810.0billion in 2009. Also, in 2015, 2017 and 2019, fiscal deficits were ₦1,109.0billion, ₦2,273.9billion and ₦4,620.0billion respectively (CBN, 2019). The growth rate of fiscal deficits was 97.6% in 1981, 171.54% in 1986 and 3,104.94% in 1996. It was 2,567.78% in 1998 and 109.42% in 2017. In 2018 and 2019, the fiscal deficit growth rate was 33.53% and 25.95% respectively.

The persistence and growth of fiscal deficits in developed and developing economies and their consequences on economic activities have rekindled interest in fiscal deficits – economic growth nexus among policymakers, economists and researchers in recent times. The interests arise from the fact that in many developing countries, Nigeria inclusive, fiscal deficits seem not to produce desirable macroeconomic outcomes. Originally, deficit fiscal policy as postulated by Keynes (1936) was to be adopted by countries to fight a fall in output, boost aggregate demand and tackle unemployment during periods of depression, by drawing back idle resources into use to restore full employment equilibrium (Onoh, 2013). Arguably, economies of many developing countries including Nigeria, where fiscal deficit policy have been adopted seem not to fare better. In Nigeria, despite the adoption of the fiscal deficit policy for about 40 years, the Nigerian economy has been characterized by a high unemployment rate, high poverty incidence, high inflation rate, increased public debt, persistent exchange rate

depreciation, high-interest rate and low level of investment, unfavourable balance of payments and consequently, low growth rate.

The objective of this study is to examine empirically the impact of fiscal deficits on economic growth in Nigeria for the period (1981 - 2021) using the Autoregressive Distributed Lag (ARDL) model as well as verify the causality between the variables. The remaining part of this paper is organized thus: Section 2 reviews relevant literature on the effect of fiscal deficits on economic growth. The methodological approaches adopted in the study are presented in section 3, while section 4 elaborates on empirical results. Finally, section 5 provides the summary, recommendations and conclusion.

2 Literature Review

2.1 Conceptual Discourse

A fiscal deficit is an excess of the government's total expenditure over its total revenue in an accounting year. The World Bank (2005) described fiscal deficit as an excess of the public sector spending over its revenue. A fiscal deficit arises when government outlays exceed its revenue. While government revenue comprises tax and non-tax revenue, government outlays are made up of recurrent and capital expenditures. Recurrent expenditure is expenditure on wage payments, purchase of goods and services, interest payment on loans, transfer payments, etc. Capital expenditures, on the other hand, are expenditures on capital projects such as buildings of infrastructural facilities and some projects which are deemed beneficial and self-liquidating in the long run and will lead to expansion of the productive capacity of the economy (Ekpo et al., 2022). Fiscal deficit can be classified into both current negative and primary negative fiscal balances (Rapu et al., 2012). The current negative fiscal balance occurs when current expenditure is greater than current revenue whereas, the primary negative fiscal balance is the total balance less transfer payments. The primary fiscal balance is a non-debt deficit.

Fiscal deficit is caused and enhanced by factors such as a shortfall in revenue from taxes, large public sector, non-diversification of the revenue base of the economy, the rising cost of government activities due to rising inflation rate, corruption and mismanagement of available public funds, demographic changes and decline in terms of trade. Population growth is positively associated with an increase in government spending on health, education and social security. Similarly, waste and corrupt practices make the cost of public projects in some developing countries, Nigeria inclusive, higher than those of similar projects in other countries. In addition, increased government expenditure could be a result of the need to combat security crises and exogenous circumstances such as higher interest charges on foreign debts and increased dependence on non-concessional loans.

Government deficit spending is believed to have stimulating effects on the economy during times of recession by raising aggregate demand, hoisting private investment, creating employment, and increasing output and income. Public expenditure in the provision of public goods like physical infrastructure (good road network and stable power supply), defence, maintenance of law and order, rule of law and protection of property rights, merit goods such as education and health services, and target intervention (such as export subsidies) boosts economic activity and enhances economic growth (Ekpo, 2021). Economic growth, in real terms, means a sustained increase in per capita national output or net national product over a long time (Dwivedi, 2009). In principle, it is the quest to achieve economic growth that has motivated the governments of many countries, especially developing countries to purposefully resort to fiscal deficit spending.

2.2 Theoretical Framework

The relationship between fiscal deficit and economic growth is explained by three main theories: the Keynesian theory, the neoclassical theory and the Ricardian Equivalence Hypothesis (REH). The Keynesian's prescription for dealing with unemployment, economic instability, economic stagnation and depression is a purposeful unbalanced budget. Keynesian theory, which focuses on the short-term effect of fiscal deficit, posits that budget deficit is a compensatory fiscal policy measure to manage the economy during periods of low economic activity (Rapu et al., 2012). During a recession, deliberate

government fiscal deficits could act as an impulse to economic growth through the stimulation of aggregate demand. The Keynesian proposition is premised on the assumption that a substantial proportion of the population is believed to be either short-sighted, improvident or liquidity-constrained. Second, the propensity to consume out of current disposable income of these individuals is assumed to be very high. Third, a momentary tax cut is expected to have an instantaneous and quantitatively meaningful impact on aggregate demand. Fourth, if the resources of the economy are unutilized/underutilized at the onset, there is potential for an increase in national income which generates second-round effects and the famous Keynesian multiplier. Therefore, so long as fiscal deficits can stimulate both consumption and national income, saving and capital accumulation will not be negatively affected. Thus, a properly planned and timed fiscal deficit is believed to have favourable consequences on economic growth (Fischer & Easterly, 1990; Rapu et al., 2012). In support of Keynesian position, Fischer & Easterly (1990) argued that when the government uses debt to finance its expenditures, consumer's income will increase as some money is injected into the economy. In the short run, given that resources are not fully utilized, crowding out of private investments by high-interest rates would not occur. Similarly, Chakraboty (2006) averred that budget deficit has a positive effect on macroeconomic activities by stimulating aggregate demand thereby raising both private and public consumption which further encourages savings and investment even at high interest rates.

Ricardian Equivalence Hypothesis (REH) propounded by David Ricardo and later expanded by Barro (1989), posits that fiscal deficit does not have any effect on the total level of demand and interest rate and consequently, economic growth; hence, fiscal deficit neither stimulate nor inhibit economic growth. The major source of government revenue is taxation and fiscal deficit implies the government is spending beyond its tax revenue. Deficit financing involves borrowing to spend and the loan obtained must eventually be repaid. In an attempt to repay the loan, tax which was not raised in the previous years will eventually be raised higher than what was supposed to have been paid earlier. REH argued that taxpayers/consumers respond to tax relief by saving the additional disposable income rather than increasing consumption expenditure (Saeed & Khan, 2012). Therefore, if private savings and fiscal deficit grow by the same proportion, the net national saving will remain unaffected and consequently, the interest rate will remain unaltered. Similarly, based on the same argument, the current budget deficit financed through borrowing rather than taxation will have no effect on the current account balance since the resultant increase in private savings will provide sufficient loanable funds in the economy to avoid external borrowing. REH maintains that a government attempt to influence aggregate demand using fiscal policy (increase in government spending and cuts in taxes) will prove fruitless because the overall demand in the economy would remain unchanged as a cut in today's taxes will be matched by an increase in future taxes, leaving real interest rates, and thus, private investment and the current account balance, exchange rate and domestic production unchanged (Barro, 1989; Saeed & Khan, 2012). Therefore, fiscal deficits neither 'crowd in' nor 'crowd out' private investment and consequently, have no effect on economic growth.

The argument in REH is based on the assumption that successive generations are interrelated through voluntary impelled resource transfer. Within given conditions, an individual's consumption will be determined as a function of dynastic resources (that is, the sum of the total resources of a taxpayer and the resources of all his past generations). It also assumed that households have 'perfect foresight' through perfect information and knowledge on the effect of tax cuts. Fiscal deficits financed through debt financing (or tax cuts) mean a shift in the payment of taxes from the present generation to future generations. Therefore, present discounted values of taxes and expenditures must be equal, and by so doing it leaves dynastic resources unaffected. Following from the assumptions, it means that if taxes are non-distortionary, then the mix of tax cuts without a subsequent cut in expenditure and debt financing is irrelevant in the sense that there is no impact on the equilibrium sequence of key real macroeconomic variables, consumption inclusive and in turn, no effect on economic growth (Rapu, et al., 2012; Onwioduokit, 2012; Eusepi et al., 2011).

The Neoclassical paradigm championed by A. Marshall, A. C. Pigou, Leon Walras and Milton Friedman (Anyanwu & Oaikhenan, 1995) upholds a balanced budget philosophy. This theory focuses on the long-term effect of fiscal deficit and stresses that fiscal deficit is a major source of economic instability and retardation of economic growth as it hikes interest rates, crowds-out private investment and places an undue tax burden on future generations. Their arguments hang on "resource displacement" and "financing cost". They posit that deficit spending transfers resources from the productive sector of the economy to the unproductive sector. According to them, the private sector is the productive sector while the government is the unproductive sector which misallocates and uses the resources inefficiently. They also stressed that the cost of servicing public debt puts additional burden and constraint on the private sector as additional taxes required to repay the debt may impair the ability of the private sector to accumulate savings for investment purposes.

In the standard neoclassical model, other things being equal, fiscal deficits reduce national savings and increase aggregate demand (Rapu et al., 2012). The neoclassical model is based on the assumption that every individual is focused and plans their lifecycle consumption and there is full utilization of resources (Adegboyo et al., 2020). The three main features of this theory include the fact that an individual's consumption is determined as a solution to the inter-temporal optimization problem, where both borrowing and lending are permitted at the interest rate in the market rate. Also, consumers have a finite life span, which implies that each consumer belongs to a specific generation and successive generations overlap. Third, there is market clearing in all periods. The neoclassical argues that by shifting taxes to future generations, persistent fiscal deficit raises total lifetime consumption and that an increase in current consumption inevitably means a reduction in savings. To raise savings, interest rates must increase, thereby bringing the capital market into equilibrium. High interest rate dampens private investment; hence fiscal deficit can 'crowd out' private investment. Consequently, the private sector being an engine of economic growth, fiscal deficits will impact negatively on economic growth.

Deducing from the above discourse, fiscal deficit can enhance, retard or be neutral to economic growth. There are two diverse views on the effects of budget deficit on private investment: the conventional view of "crowding-out" of private investment and the non-conventional view of "crowding-in" of private investment. The results of empirical studies on the impact of fiscal deficits on economic growth support this assertion as there have been mixed findings across countries and studies.

2.3 Empirical Review

The impact of fiscal deficit on economic growth has been a subject of controversy and inconclusive debate among economists over the years. The findings of many cross-country and country-specific empirical studies on the relationship between fiscal deficits and economic growth are mixed and have remained inconclusive. While many studies report a positive relationship between fiscal deficit and economic growth (Kelly, 1997; Bahmani, 1999; Aghion & Marinescu, 2007; Kumar & Soumya, 2010; Onwioduokit, 2012; Onwioduokit & Ekong, 2016, Hussain & Haque, 2017, Sharma & Mittal, 2019), the results found in some other studies have shown negative relationship (Barro, 1991; Ghali, 1998; Goher et al., 2011; Iqbal et al., 2017; Tung, 2018; Aero & Ogundipe, 2018; Sharma & Mittal, 2019, Adegboyo et al., 2020). In some other studies, no relationship is found between fiscal deficit and economic growth (Ghali & Al-Shamsi, 1997).

Adam & Bevan (2005) employed a simple overlapping generations (OLG) model to study the relationship between fiscal deficit and economic growth for a panel of 45 developing countries from 1970 to 1999. The findings revealed that the impact of fiscal deficits depended on the financing mix and the outstanding debt stock; deficit spending is growth-enhancing if financed by limited seigniorage, growth-inhibiting if financed by domestic debt and has opposite flow and stock effects if financed by external loans at market rates of interest.

Using Fully Modified Ordinary Least Square (FMOLS) and Dynamic Ordinary Least Squares (DOLS) methods, Goitsemodimo et al., (2018) employed a panel dataset to study the effect of budget deficit on the economic growth of the BRICS nations. The results from the two models showed that

fiscal deficit had a positive impact on economic growth in BRICS nations. Similarly, Ravinthirakumaran & Kasavarajah (2016) examined the effect of fiscal deficit on the economic growth of selected South Asian countries (Bangladesh, India, Nepal, Pakistan and Sri Lanka) using the Vector Autoregressive (VAR) technique of analysis. The findings indicated that fiscal deficit had a positive impact on the economic growth of Nepal but a negative effect on the economic growth of Bangladesh, India, Pakistan and Sri Lanka.

Rahman (2012) utilized the quarterly data for the period (2000-2011) and the ARDL method of analysis to investigate the long-run relationship between the budget deficit and economic growth of Malaysia. It was found that there was no long-run relationship between the budget deficit and economic growth of Malaysia, consistent with the Ricardian equivalence hypothesis. Epaphra (2017) studied the impact of fiscal deficit on selected macroeconomic variables in Tanzania for the period (1966 -2015) using the Vector Error Correction model (VECM). The result indicated that fiscal deficit impacted negatively on real GDP. Also, Hussian & Haque (2017) employed data from two different sources, the World Bank and the Bangladesh Bureau of Statistics (BBS) to investigate the relationship between fiscal deficit and economic growth in Bangladesh for the period (1993 - 2016) using Vector Error Correction Model (VECM) method. The finding from data obtained from BBS showed that fiscal deficit had a significant positive effect on economic growth in tandem with Keynesian theory, while findings from data sourced from the World Bank indicated that fiscal deficit had a significant negative impact on economic growth in line with neoclassical theory.

Anantha & Gayithri (2016) employed the VECM method to study the effect of fiscal deficit on economic growth in India for the period (1980 - 2013) and found that fiscal deficit had a negative impact on economic growth. Similarly, Sharma & Mittal (2019) investigated the impact of fiscal deficit on economic growth in India for the period (1981 - 2016) using ARDL estimation technique and the result revealed that fiscal deficit had a negative effect on economic growth.

Fatima et al., (2012) used the Ordinary Least Square (OLS) method to examine the effect of budget deficit on economic growth of Pakistan for the period (1978 - 2009) and found that budget deficit had a negative relationship with economic growth. Similarly, Iqbal et al., (2017) examined the impact of fiscal deficit and economic growth in Pakistan for the period (1972 - 2014) as well as the threshold of fiscal deficit using the smooth transition autoregressive (STAR) model. The result indicated that fiscal deficit had a negative effect on economic growth and a fiscal deficit threshold level of 5.57 per cent of GDP was found for Pakistan. Contrary to Fatima et al., (2012) and Iqbal et al.,'s (2017) findings, Nayab (2015) examined the impact of budget deficit on economic growth in Pakistan for the period (1976 – 2007) using the Vector Autoregressive lag model and Vector Error Correction model and found that budget deficit had a positive impact on economic growth in support of Keynesians view on deficit spending.

Van & Sudhipongpracha (2015) examined the effect of budget deficit on economic growth in Vietnam for the period (1989-2011) and found that deficit spending had no direct effect on the country's economic productivity within the period of study. This result is in line with the Ricardian equivalence hypothesis which posits that there is a neutral relationship between budget deficit and economic growth. In contrast, Tung (2018) investigated the effect of fiscal deficit on economic growth in Vietnam for the period (2003 - 2013) using the correlation matrix technique and found that fiscal deficit had a negative impact on economic growth in line with the neoclassical view.

Bahmani (1999) studied the effect of budget deficits on real investment in USA using quarterly data for the period (1947-1992) and found that budget deficits crowds-in real investment; supporting the Keynesian's position which posits that budget deficits, by raising the level of domestic economic activity, will crowd-in private investment and enhance economic growth. Similarly, Onwioduokit & Ekong (2016) employed the Ordinary Least Square (OLS) method and dataset of over 30 years to examine the impact of budget deficits and economic growth in Sierra Leone. The result of the study showed a positive relationship between budget deficits and economic growth in line with the Keynesian assertion. In contrast, utilizing quarterly data for the period (2000 - 2015) and the ARDL method to

investigate the effect of fiscal deficit on economic growth in Ghana, Nkrummah et al., (2016) found that fiscal deficit had a negative impact on economic growth in line with the neoclassical proposition.

In Nigeria, Adegboyo et al., (2020) examined the impact of fiscal deficit on economic growth for the period (1980 - 2018) using the ARDL technique and found that fiscal deficit had a negative effect on economic growth. Similarly, Aero & Ogundipe (2018) investigated the effect of fiscal deficits on economic growth for the period (1981-2014) and the fiscal deficit threshold in Nigeria using the Threshold Autoregressive model. The findings showed a significant negative relationship between fiscal deficits and economic growth and a fiscal deficit threshold level of 5% for Nigeria. In contrast, Momodu & Monogbe (2017), using the Vector Autoregressive technique to investigate the impact of fiscal deficit on economic growth in Nigeria for the period (1981-2015), found that fiscal deficit had a positive effect on economic growth. The Granger causality result showed a bi-directional relationship between fiscal deficit and economic growth.

Justification: Many empirical studies have attempted to examine the impact of fiscal deficits on economic growth. Apart from the fact that the time frame in those studies was short, most of the studies were carried out in countries different from Nigeria's context. In addition, the results are mixed and inclusive. Consequent to these shortcomings, there is a knowledge gap in the literature which warrants this study. This study improves on the previous studies by employing a broad dataset spanning (1981 – 2021), covering all the periods of economic reforms in Nigeria. Also, it employed the ARDL Bound test approach which is a relatively advanced econometric technique as well as taking care of the problem of missing variables by incorporating other variables like the domestic capital, unemployment rate, exchange rate, inflation rate, interest rate and trade openness into the model as importance variables which influence economic growth in Nigeria.

3. Methodology

The data collected were subjected to a unit root test to examine the stationarity property of the time series data, a co-integration test to ascertain the existence of a long-run relationship of the variables and an Error Correction Method (ECM) to establish the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The Autoregressive Distributive Lag (ARDL) model proposed by Pesaran et al., (2001) was employed to examine the nature of short-run and long-run relationships.

3.1 Model Specification

To capture the growth-effect of fiscal deficits in Nigeria, the modified and extended aggregate production function used for analysis in this study is modeled as follows:

RGDP = f (GCF, UNR, FD, INF, EXR, TOP, INT) --- (1)

Taking logarithm of both sides of equation (1), the stochastic model is expressed as follows:

$\ln RGDP = bo + b_1 \ln GCF + b_2 UNR + b_3 \ln FD + b_4 INF + b_5 \ln EXR + b_6 \ln TOP + b_7 INT + U_t$ --- (2)

Where RGDP = Real Gross Domestic Product (proxy for economic growth), GCF = Gross Capital Formation (proxy for domestic capital), UNR = Unemployment Rate, FD = Fiscal Deficit, INF = Inflation Rate, EXR = Exchange Rate, TOP = Trade Openness and INT = Interest Rate. U_t = Error term which captures unexplained influence on the dependent variable, b_0 = constant parameter while b_1, - - - , b_7 are the parameters of the independent variables to be estimated. A priori expectation is as follows: b_1, b_3 and $b_6 > 0$ while b_2, b_4, b_5 and $b_7 < 0$.

3.3 Data and Data Sources

The variables of interest in the study were fiscal deficit (FD) and real gross domestic product (RGDP) (proxy for economic growth). The control variables employed were exchange rate (EXR) (reflects the credibility of policies), gross fixed capital formation (GCF) (reflects domestic capital stock of the economy), unemployment rate (UNR), trade openness (TOP) (captures the openness of the economy), inflation rate (INF) (reflects macroeconomic stability) and interest rate (INT). The quantitative data on

fiscal deficit (FD), gross capital formation (GCF), inflation rate (INF) and real gross domestic product (RGDP) were obtained from the Central Bank of Nigeria Statistical Bulletin (CBN, 2021) as well as CBN database (various years) while data on exchange rate (EXR), trade openness (TOP) and unemployment rate (UNR) were obtained from the World Bank Development Indicator (World Bank, 2021).

3.2 Estimation Technique

Time series data for the period (1981 - 2021) were used in the estimation of the model. The estimation of the model was carried out in three stages. First, to ensure that the variables possess the same empirical characteristics that would guarantee convergence to equilibrium in the long run, thereby overcoming the possibility of spurious correlation of variables in the model, the stationarity property of each variable was checked using Augmented Dickey-Fuller (ADF) unit root test. The ADF test involves estimating the equation (Gujarati & Sangeetha, 2007):

$\Delta Y_t = \alpha_1 + \alpha_{2t} + \beta Y_{t-1} + \Sigma^m_{i=1}(\theta i \Delta Y_{t-1}) + \mu_t$ ---(3)

Where Y is a time series, Δ is the difference operator, t is a linear time trend, and μ is a pure noise error term, α_1 is a constant, α_2 and β are parameters to be estimated and $\Delta Y_{t-1} = Y_{t-1} - Y_{t-2}$, $\Delta Y_{t-2} = Y_{t-2} - Y_{t-3}$, etc. The null hypothesis, H_0 states that there is a unit root (that is, non-stationary, $\beta = 0$) and the alternative hypothesis, H_1 states that there is stationarity (absence of unit root in the series, $\beta < 0$). The decision rule is to reject H_0, if the ADF t-statistic is less than the reported ADF critical value at a chosen level of significance. If otherwise, accept H_0.

The second stage of the estimation process involved conducting a cointegration test to establish the existence or otherwise of a long-run equilibrium relationship among the variables. The autoregressive distributed lag (ARDL) cointegration technique was employed. The ARDL method is considered the best compared to other econometric methods in a case where the variables are stationary at I(0), I(1) or have a mix of I(0) and I(1). However, this technique will crash if an integrated order of I(2) is present. The existence of a long-run relationship of the variables was tested by computing the Bound F-statistic (Wald test) and established when the F-statistics exceeded the critical bound values.

When cointegration is established, the next step involves estimating the long-run ARDL model for RGDP. The ARDL model contains the lagged value of the dependent variable (RGDP) and the current and lagged values of regressors (GCF, UNR, FD, INF, EXR, TOP, INT) as explanatory variables. Therefore, equation (2) can be written in ARDL form as follows:

$\Delta lnRGDP_t = a_o + \Sigma a_1 \Delta lnRGDP_{t-1} + \Sigma a_2 \Delta lnGCF_{t-1} + \Sigma a_3 \Delta UNR_{t-1} + \Sigma a_4 \Delta lnFD_{t-1} + \Sigma a_5 \Delta INF_{t-1} + \Sigma a_6 \Delta lnEXR_{t-1} + \Sigma a_7 \Delta lnTOP_{t-1} + \Sigma a_8 \Delta INT_{t-1} + b_1 lnRGDP_{t-1} + b_2 lnGCF_{t-1} + b_3 UNR_{t-1} + b_4 lnFD_{t-1} + b_5 INF_{t-1} + b_6 lnEXR_{t-1} + b_7 lnTOP_{t-1} + b_8 INT_{t-1} + \varepsilon_t$ ---(4)

where a_o represents the drift component, Δ is the first-difference operator, a_i is long-run multipliers, b_i are short-run dynamic coefficients and ε_t shows the white noise.

The error correction model (ECM) was employed to assess the short-run dynamics. The ECM model takes a sufficient number of lags to capture the data generating process from general to specific modeling frameworks. The ECM general form of equation (3) is formulated as:

$\Delta lnRGDP_t = a_o + \Sigma a_1 \Delta lnRGDP_{t-1} + \Sigma a_2 \Delta lnGCF_{t-1} + \Sigma a_3 \Delta UNR_{t-1} + \Sigma a_4 \Delta lnFD_{t-1} + \Sigma a_5 \Delta INF_{t-1} + \Sigma a_6 \Delta lnEXR_{t-1} + \Sigma a_7 \Delta lnTOP_{t-1} + \Sigma a_8 \Delta INT_{t-1} + \Omega lnECM_{t-1} + \varepsilon_t$ ---(5)

where Ω is the coefficient of ECM for short-run dynamics.

4. Analysis of Empirical Results

4.1 Descriptive Statistics

Table 4.1: Descriptive Analysis of the Data

	RGDP	FD	GCF	UNR	INF	INT	TOP	EXR
Mean	15.14	-4.45	6.35	17.00	17.79	7.07	3.36	3.60
Median	15.34	-4.68	7.43	17.50	12.22	7.00	3.53	4.71
Maximum	18.67	3.47	9.92	29.80	72.84	17.36	3.98	5.99
Minimum	11.14	-8.73	1.01	7.50	5.40	4.30	2.21	-0.48
Std. Dev.	2.49	2.68	2.96	4.98	15.54	2.06	0.50	2.01
Skewness	-0.11	0.53	-.098	0.07	2.16	3.02	-0.98	-0.79
Kurtosis	1.56	3.17	2.45	3.30	6.66	16.08	2.94	2.37
Jarque-Bera	3.60	2.03	7.16	0.19	53.88	35.46	6.69	4.93
Probability	0.16	0.36	0.02	0.90	0.00	0.00	0.03	0.08
Observation	41	41	41	41	41	41	41	41

Source: Author's Computation

The descriptive statistics of the variables employed in the study are presented in Table 4.1. The mean of FD was -4.45 while the mean of RGDP was 15.14. Besides, INT had the highest mean value (about 17.79) followed by UNR (17.00). The minimum and maximum values of FD were 8.73 and 3.47 respectively while the minimum and maximum values of RGDP were 11.14 and 18.67 respectively. The highest standard deviation was about 15.54, displayed by the inflation rate (INF).

4.2 Unit Root Test Results

The ADF test result is presented in Table 4.2. It reveals that gross capital formation (GCF), inflation rate (INF) and interest rate (INT) were stationary at level, 1(0) while real gross domestic product (RGDP), fiscal deficit (FD), unemployment rate (UNR), exchange rate (EXR) and trade openness (TOP) were stationary after the first difference, l(1). The result confirms the absence of I(2) series, thus indicating the suitability of the variables for the ARDL bounds test.

Table 4.2: ADF Unit Root Test Result

VARIABLES	ADF STATISTIC	MACKINNON CRITICAL VALUES			ORDER OF INTEGRATION	PREDICTION
		@ 1%	@ 5%	@ 10%		
RGDP	-5.99	-3.61	-2.21	-2.60	I(1)	Stationary
FD	-5.53	-3.61	-2.94	-2.60	I(1)	Stationary
GCF	-4.36	-3.610	-2.93	-2.60	I(0)	Stationary
INF	-4.22	-3.61	-2.93	-2.60	I(0)	Stationary
UNR	-3.02	-3.61	-2.93	-2.60	I(1)	Stationary
INT	-3.12	-3.61	-2.93	-2.60	I(0)	Stationary
TOP	-7.65	-3.61	-2.93	-2.60	I(1)	Stationary
EXR	-5.37	-3.61	-2.93	-2.60	I(1)	Stationary

Source: Author's Computation

4.3 Co-integration Test Result

Table 4.3: ARDL Bounds Test for Cointegration Result

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	4.662439	10%	2.03	3.13
k	7	5%	2.32	3.5
		2.5%	2.6	3.84
		1%	2.96	4.26

Source: Author's Computation

The ARDL Bounds test result presented in Table 4.3 shows that the F-statistic value of 4.662 is greater than the lower and the upper bound critical value at 1%, 5% and 10% level of significance. This confirms the existence of a long-run relationship between the macroeconomic variables estimated in the model.

4.4 Analysis of Estimated Results for Linear Growth Equation

Table 4.4: Long-run Autoregressive Distributed Lag Model Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDS	0.165786	0.167460	0.990007	0.3379
GCF	0.357937	0.155270	2.305256	0.0359
INT	-0.325942	0.132389	-2.461997	0.0264
UNR	-1.030083	0.363324	-2.835163	0.0125
INF	-0.001020	0.031805	-0.032083	0.9748
EXR	0.535162	0.434543	1.231551	0.2371
TOP	3.831104	1.516322	2.526577	0.0233
C	12.54065	4.989889	2.513213	0.0239

EC = RGDP - (0.1658*FDS + 0.3579*GCF -0.3259*INT -1.0301*UNR -0.0010 *INF + 0.5352*EXR + 3.8311*TOP + 12.5407)

Source: Author's Computation

ARDL long-run and short-run results for equation (4), are presented in Table 4.4 and Table 4.5 respectively. The coefficient of fiscal deficit (FD) has a positive sign of 0.166 and 0.092 in the long-run and the short-run respectively, in line with a priori expectation which suggests a positive effect of fiscal deficit on economic growth though insignificant. This implies that a 1.0 per cent increase in fiscal deficits will result in approximately 1.7 per cent and 0.92 per cent increase in economic growth in the long-run and short-run respectively. The insignificant impact of fiscal deficit suggests that deficit spending has not been efficiently financed, prudently managed and productively utilized on public investment which is capable of expanding the productive capacity of the economy to enhance output growth. The positive effect of fiscal deficits is in tandem with the Keynesian paradigm, and the findings by Al-Khedair (1996) for the seven major industrial countries (G-7), Onwioduokit (2012) for Guinea and Goitsemodimo et al., (2018) for the BRICS nations. It contradicts the neoclassical theory and the findings of Adegboyo et al., (2020) for Nigeria, Iqbal et al., (2017) for Pakistan, Epaphra (2017) for Tanzania and Tung (2018) for Vietnam.

For other variables employed in the model, the coefficient of GCF is 0.358, indicating a positive and significant effect on economic growth in the long run. Thus, a 1.0 per cent increase in GCF will result in a 3.58 per cent increase in economic growth (RGDP). In the short run, the coefficient of GCF is -0.18, showing a negative but insignificant effect on economic growth, while the coefficient of GCF with a year lag is 0.217, indicating a positive and significant impact on economic growth. The overall impact of the increase in GCF on the economic growth rate (long-run and short-run lag) is positive and is consistent with conventional theory.

Table 4.5: Short-Run Autoregressive Distributive Lag Result

Dependent Variable: RGDP
Method: ARDL
Date: 08/13/22 : 10:28
Sample (adjusted): 4 41
Included observations: 38 after adjustments
Maximum dependent lags: 3 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (3 lags, automatic): FDS INF INT EXR GCF UNR TOP
Fixed regressors: C
Number of models evaluated: 49152
Selected Model: ARDL (1, 0, 2, 2, 3, 1, 3, 3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RGDP (-1)	0.444523	0.142331	3.123161	0.0070
FDS	0.092090	0.088503	1.040529	0.3146
INF	0.021451	0.012506	1.715222	0.1069
INF (-1)	-0.002835	0.011649	-0.243358	0.8110
INF (-2)	-0.019183	0.013745	-1.395651	0.1831
INT	0.003991	0.053008	0.075296	0.9410
INT (-1)	-0.045367	0.051706	-0.877397	0.3941
INT (-2)	-0.139678	0.044075	-3.169110	0.0064
EXR	-1.425387	0.783921	-1.818279	0.0890
EXR (-1)	1.130263	0.800845	1.411338	0.1785
EXR (-2)	-0.790617	0.684536	-1.154968	0.2662
EXR(-3)	1.383011	0.590709	2.341273	0.0334
GCF	-0.018016	0.064202	-0.280611	0.7828
GCF (-1)	0.216842	0.069757	3.108537	0.0072
UNR	-0.229337	0.135899	-1.687557	0.1122
UNR (-1)	0.127017	0.203048	0.625553	0.5410
UNR (-2)	-1.038678	0.329770	-3.149705	0.0066
UNR (-3)	0.568811	0.242987	2.340906	0.0335
TOP	1.261657	0.507829	2.484414	0.0253
TOP (-1)	-0.894696	0.706594	-1.266211	0.2247
TOP (-2)	-0.332553	0.782446	-0.425017	0.6769
TOP (-3)	2.093681	0.643335	3.254417	0.0053
C	6.966041	3.868072	1.800908	0.0919

R-squared	0.973695	Mean dependent var	15.39421
Adjusted R-squared	0.935115	S.D. dependent var	2.416917
S.E. of regression	0.615650	Akaike info criterion	2.148716
Sum squared resid	5.685382	Schwarz criterion	3.139886
Log likelihood	-17.82560	Hannan-Quinn criter.	2.501367
F-statistic	25.23814	Durbin-Watson stat	2.883749
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Source: Author's Computation

INT had a negative and significant impact in the long run, with a coefficient of -0.326, but in the short run, the current year coefficient is 0.003, indicating a positive effect on economic growth. However, the coefficient of INT with one year and two years lag are approximately -0.045 and -0.140 respectively, showing a negative impact of interest rate on economic growth. Hence, the impact of INT on economic growth is negative, in line with economic theory. The coefficient of UNR in the long-run and short-run respectively are approximately -1.030 and significant, and -0.229 but insignificant; indicating a negative impact on economic growth. This result is not surprising considering manpower waste in

Nigeria as a result of the high rate of unemployment. INF had an insignificant negative effect on economic growth in the long run with a coefficient of approximately, -0.001. In the short run, though the current coefficient of INF is 0.021, which implies a positive impact of inflation on economic growth, one-year lag and two-year lag coefficients of the inflation rate are approximately -0.045 and -1.125 respectively, indicating a negative effect of inflation on economic growth. The coefficient of EXR is 0.535, indicating a positive though insignificant impact on economic growth in the long run but in the short run, the coefficient of EXR is -1.425, showing a negative impact of the exchange rate on economic growth. TOP had a positive coefficient of 0.356 and 3.831 in the long run and short-run respectively, indicating a positive effect on economic growth.

4.5 Granger Causality Test

Table 4.6: Pairwise Granger Causality Tests Result

Pairwise Granger Causality Tests
Date: 06/04/22 Time: 10:56
Sample: 1 41
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
FDS does not Granger Cause RGDP	40	0.39149	0.5354
RGDP does not Granger Cause FDS		7.31574	0.0103

Source: Author's Computation

Table 4.6 presents the Granger causality test result. The results show that fiscal deficit (FD) does not Granger cause real gross domestic product (RGDP) since a probability value of 0.5354 is greater than 0.05. However, the real gross domestic product (RGDP) granger caused fiscal deficit (FD) spending because the probability value of 0.0103 is less than 0.05. Therefore, there is unidirectional causality between real gross domestic product (RGDP) and fiscal deficit (FD).

4.6: Error Correction Mechanism (ECM) Result

The error correction mechanism (ECM), first used by Sargam (1983) and later popularized by Engle and Ganger (1987), was included in the model to correct short-run disequilibrium. The ECM result is presented in Table 4.7. The lagged error correction term (ECM) was included in the model to capture the long-run dynamics between the co-integrating series and was found to be negative and significant at a 5% level confirming the existence of a long-run relationship among variables. Its coefficient, -0.555477, shows the speed of adjustment rate of 55.55 per cent from the short-run to the path of long-run equilibrium. The coefficient of adjusted coefficient of determination is 0.843. This shows that the independent variables jointly explain 84.3% of the total variation in the dependent variable (lnRGDP). The F-statistic (25.23), which measures the overall significance of the estimated model, shows significance. This reinforced the goodness of fit.

Table 4.7: Error Correction Model Result

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXR)	-1.425387	0.337212	-4.226972	0.0007
D(EXR(-1))	-0.592394	0.317741	-1.864394	0.0820
D(EXR(-2))	-1.383011	0.337046	-4.103329	0.0009
D(GCF)	-0.018016	0.032580	-0.552962	0.5884
D(INF)	0.021451	0.006418	3.342059	0.0045
D(INF(-1))	0.019183	0.006035	3.178522	0.0062
D(INT)	0.003991	0.028709	0.139024	0.8913
D(INT(-1))	0.139678	0.028033	4.982538	0.0002
D(UNR)	-0.229337	0.061121	-3.752206	0.0019
D(UNR(-1))	0.469867	0.108916	4.314029	0.0006
D(UNR(-2))	-0.568811	0.114145	-4.983249	0.0002
D(TOP)	1.261657	0.332055	3.799539	0.0017
D(TOP(-1))	-1.761128	0.372070	-4.733330	0.0003
D(TOP(-2))	-2.093681	0.357810	-5.851372	0.0000
CointEq(-1)*	-0.555477	0.058342	-9.521107	0.0000

R-squared	0.902548	Mean dependent var	-0.008421
Adjusted R-squared	0.843229	S.D. dependent var	1.255693
S.E. of regression	0.497183	Akaike info criterion	1.727663
Sum squared resid	5.685382	Schwarz criterion	2.374079
Log likelihood	-17.82560	Hannan-Quinn criter.	1.957653
Durbin-Watson stat	2.883749		

Source: Author's Computation

4.7 Diagnostic Test

Serial Correlation Test: The Breusch-Godfrey Serial Correlation LM Test was conducted to test the presence of serial correlation and the result is presented in Table 4.8. The result reveals that the F-statistic value is 2.085943 with a probability value of 0.1611 which is greater than 0.05 given the level of significance. This indicates that there is no serial correlation in the model.

Table 4.8: Breusch-Godfrey Serial Correlation LM test result

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	2.085943	Prob. F(2,14)	0.1611
Obs*R-squared	8.724007	Prob. Chi-Square(2)	0.0128

Source: Author's computation

Heteroscedasticity Test

Table 4.9: Autoregressive Conditional Heteroscedasticity Test Result

Heteroskedasticity Test: ARCH

F-statistic	0.611834	Prob. F(1,35)	0.4394
Obs*R-squared	0.635684	Prob. Chi-Square(1)	0.4253

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/03/22 Time: 16:33
Sample (adjusted): 5 41
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.322983	0.125489	2.573799	0.0145
RESID^2(-1)	0.131623	0.168273	0.782198	0.4394

R-squared	0.017181	Mean dependent var	0.373185
Adjusted R-squared	-0.010900	S.D. dependent var	0.652386
S.E. of regression	0.655932	Akaike info criterion	2.047019
Sum squared resid	15.05863	Schwarz criterion	2.134095
Log likelihood	-35.86985	Hannan-Quinn criter.	2.077717
F-statistic	0.611834	Durbin-Watson stat	1.947361
Prob(F-statistic)	0.439358		

Source: Researcher's computation using E-view 12.

The heteroscedasticity test result presented in Table 4.9 shows that the F-statistic value (0.611834) with a probability value of 0.4394 which is greater than 0.05 given the level of significance. This indicates that there is no heteroscedasticity in the model, hence the result obtained from the estimated model is not biased.

Stability Test: The stability test result is presented in Table 4.10. The result shows that the probability value of t-statistic and f-statistic which is 0.0099 is less than 0.05 given the level of significance. Hence, the null hypothesis is accepted indicating that the variables used in the study have an abnormal stability.

Table 4.10: Stability Diagnostic Test

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: RGDP RGDP(-1) EXR EXR(-1) EXR(-2) FDS FDS(-1) FDS(-2) FDS(-3) GCF GCF(-1) INF INF(-1) LBF LBF(-1) LBF(-2) LBF(-3) MS TOP TOP(-1) TOP(-2) TOP(-3) C

	Value	df	Probability
t-statistic	2.951065	15	0.0099
F-statistic	8.708783	(1, 15)	0.0099
Likelihood ratio	17.39622	1	0.0000

Source: Author's Computation

5. Summary, Conclusion and Recommendations

This study examined the impact of fiscal deficits on economic growth in Nigeria for the period (1981 - 2021) as well as verified the nature of the causality that exists between them. The Autoregressive Distributive Lag (ARDL) model was employed to examine the nature of short-run and long-run relationship while Error Correction Method (ECM) was used to ascertain the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The result of the study showed that fiscal deficit (FD) has a positive impact on economic growth both in the long-run and the short-run, though insignificant. The positive effect of fiscal deficits is in tandem with Keynesian paradigm, and the findings of Al-Khedair (1996) for the seven major industrial countries (G-7), Onwioduokit (2012) for Guinea and Goitsemodimo et al (2018) for the BRICS nations. It contradicts the neoclassical theory and the findings of Adegboyo et al (2020) for Nigeria, Iqbal et al (2017) for Pakistan, Epaphra (2017) for Tanzania and Tung (2018) for Vietnam. The insignificant impact of fiscal deficit suggests that deficit spending had not been prudently managed and fully employed in public investment which could have expanded the productive capacity of the economy to enhance growth in output. As for other variables, GCF had a positive and significant effect on economic growth (RGDP) in the long-run and short-run while the impact of interest rate (INT) on economic growth was negative. The unemployment rate (UNR) has negative impact on economic growth in the long-run and short-run. This result is not surprising considering manpower waste in Nigeria as a result of high rate of unemployment. Inflation rate has negative effect on economic growth both in the long-run and short-run while exchange rate (EXR) has positive but insignificant impact on economic growth in the long-run but in the short-run, it has negative impact. Trade openness (TOP) had positive effect on economic growth in the long-run and short-run respectively. The granger causality tests result showed a unidirectional causality between real gross domestic product (RGDP) and fiscal deficit (FDS), flowing from real GDP to fiscal deficit (FDs).

Based on the findings of this study, the following recommendations are made.

(1) Deficit spending should be prudently managed and productively utilized on public investment which is capable of expanding the productive capacity of the economy, especially the provision of critical economic and social overhead capital that would enhance private investment and other productive activities.

(2) Deficit spending should be efficiently financed. To minimize adverse consequences of fiscal deficit, none of the sources of deficit financing should be exploited excessively.

(3) There should be deliberate action on the part of the government to promote productivity in the country in order to curtail inflation. Hence, anything that inhibits productivity in the country, including long queueing for hours at filling stations to buy fuel, inadequate electricity supply, incessant strikes by workers and insecurity in the country should be promptly handled by the government.

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