FISCAL CONSOLIDATION, GROWTH AND POVERTY REDUCTION: EVIDENCE FROM NIGERIA.

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Abstract
This work empirically examined the impact of fiscal consolidation on economic growth and poverty reduction in Nigeria. The specific objectives are to investigate the impact of fiscal deficit and non – fiscal control variables on economic growth and poverty reduction in Nigeria for the period 1981 to 2018 using autoregressive distributed lag (ARDL) bounds test technique and also to assess whether significant causal relationship exists between fiscal deficit and economic growth, and between fiscal deficit and poverty reduction in Nigeria over the period, using Granger causality approach. Fiscal deficit has positive relationship with and statistically significant impact on economic growth in Nigeria in the long run; trade openness and foreign direct investment have no significant impact on economic growth in Nigeria over the period studied. Total government expenditure has negative relationship with and insignificant impact on real gross domestic product both in the long run and short run. Government total revenue, on the other hand, showed positive relationship with but insignificant impact on real gross domestic product both in the long run and short run. Government recurrent and capital expenditures impact significantly on economic growth in Nigeria in the long run. The result also showed that in the short run, capital expenditure of government significantly impacts economic growth while recurrent expenditure does not. Direct tax related negatively with economic growth in the short and long run, and that its impact on growth is statistically significant in short run and insignificant in long run. On the other hand, the result further indicated that indirect tax impacts significantly on growth in the long run and that it positively relates with economic growth in Nigeria. Fiscal deficit lag one was found to have statistically significant impact on poverty. Government expenditure, government revenue, foreign direct investment, and trade openness showed statistically significant impact on poverty reduction in Nigeria in the short run. The result further revealed that fiscal deficit (FISCD), government expenditure (LOG(GOVEXP)), government revenue (LOG(GOVREV)), foreign direct investment (LOG(FDI)), and trade openness (TOP) have statistically significant impact on poverty reduction in Nigeria in the long run. The coefficient of error correction mechanism (ECM) of the poverty model V is negative and statistically significant; indicating that approximately 26.5% of any movement into disequilibrium is corrected back to the long run equilibrium within a year. The result of Granger causality test indicated that there is no significant causality relationship between (i) real gross domestic product (proxy for economic growth) and fiscal deficit in Nigeria and (ii) per capita income (proxy for poverty) and fiscal deficit in Nigeria over the studied period. The study recommends that government should reduce the size of her deficits through fiscal consolidation so as to attain the desired level of sustainable economic growth; complement fiscal consolidation by comprehensive debt reduction strategies and structurally reform the economy to boost competitiveness and redistribute income through subsidizing government services. The future economic growth has to be pro-poor.

1.0 Introduction

Most economies, developed and developing, in recent times, advocated fiscal consolidation (revenue and/or expenditure based) as a veritable strategy for minimizing deficits and curtailing accumulation of additional debts in order to enthrone fiscal soundness necessary for achieving high and sustainable economic growth and subsequent reduction in level of poverty. Over the years, the desire to grow Nigerian economy, address rising unemployment problem and subsequently reduce poverty scourge in Nigeria prompted Nigerian Government to, not only give prominence to fiscal policy measures in her macroeconomic management, but engage in fiscal consolidation. In spite of these fiscal efforts, impressive levels of economic growth and reduction in poverty are yet to be achieved in Nigeria. It is, therefore, not clear enough whether fiscal consolidation impacts significantly on growth and poverty in Nigeria. Therefore the objective of this paper is to ascertain the impact of fiscal consolidation on economic growth and poverty reduction in Nigeria. The study also wants to determine the causality relationships between fiscal consolidation, economic growth and poverty in Nigeria for the period 1981 – 2018.

2. Literature Review

Existing literature indicates various theoretical views on the impact of fiscal deficit on economic growth. Prominent among these perspectives are the Keynesian, the Ricardian Equivalence Hypothesis (REH), neoclassical, the supply side perspective and the modern synthesis. The Keynesian theory is that increase in government expenditure would have positive effect on the level of output in an economy, and that government should adopt active fiscal policy and conduct fiscal deficit in order to stimulate aggregate demand.

The Ricardian Equivalence Hypothesis (REH) is of the view that individuals expect that increasing government spending through borrowing in the current period would, in future, result in higher taxes, and added that the individuals would respond to such situation by reducing demand with the result that the net impact of fiscal expansion might be neutral. Similar responses to the fiscal policy had also been suggested by the rational expectation models.

The Neoclassical perspective is of the view that fiscal deficits are bad for the economy. According to this perspective, increase in government expenditure leads to borrowing, which puts pressure on interest rate, giving rise to crowding out private investment through public borrowing. The Neoclassical also believed that the effectiveness of fiscal policy depends on time and as such, the lagged response would make it hard for the fiscal policy to be effective.

The supply side view is that deficit leads to higher taxes which are always distortionary and change the incentives that affect the supply. The policies that are fully anticipated, according to the proponents of this view, have no effect on the output level; unanticipated policies, however, affect the level of output through the supply side.

The modern synthesis perspective posits that fiscal deficit is a natural phenomenon during recessions and that fiscal surplus can occur during the expansion phase of the economy. The

economy, thus, automatically moves towards full employment equilibrium and what this implies is that the discretionary fiscal policy is not potent and easy to carry out.

Empirical Review

Santiago, Alberto, Sanchez-Fernandez, and Bermudez (2019) empirically investigated whether fiscal consolidation hurts economic growth in Spanish regions. Their aim was to bring empirical evidence on the effect of fiscal consolidation in decentralized countries with focus on Spain. They showed, through the use of both time series econometrics and the Synthetic Control Method approach (SCM), that compliance with fiscal targets at the regional level had not involved lower GDP growth rates in the short-run. Openness and economic integration of regional economies revealed that fiscal multipliers tend to fade. They noted that while a fiscal stimulus would not work on that scale, the opposite was also true: the potentially negative demand effects of a stronger regional fiscal consolidation strategy would be exported to other regions.

Antonio and Summers (2018) empirically explored the connections between fiscal consolidations and growth rates in advanced economies by extending to longer horizons the methodology of Blanchard and Leigh (2013) regarding fiscal policy multipliers. Their results supported the presence of strong hysteresis effects of fiscal policy. They added that the large size of the effects pointed in the direction of self-defeating fiscal consolidations that was suggested by DeLong and Summers (2012) and noted that attempts to reduce debt through fiscal consolidations had often resulted in a higher debt to GDP ratio through their long-term negative impact on output.

Ali, Omer, and Ahmed (2017), using nonlinear specification, examined fiscal consolidation and economic growth in Pakistan to find out whether or not fiscal consolidation had positive impact on economic growth of the country, whether nonlinear relationship did exist between fiscal deficit and economic growth in Pakistan and also to compute optimal level of fiscal deficit that would enhance growth, using data from 1976 to 2015. They found out that, fiscal deficit, at the current level, had positive association with economic growth while fiscal deficit at a very high level had damaging effect for growth.

Idris and Bakar (2017) evaluated the effects of fiscal operations on macroeconomic growth in Nigeria using descriptive method and utilizing both charts and table to show the trend of fiscal elements to determine the relationship between the variables. They concluded that fiscal operation was ineffective in providing the needed macroeconomic environment for sustainable growth and noted that government should reduce the size of its deficits, broaden the revenue base through an increase in contribution from non-oil sources, and synchronize monetary and fiscal policies so as to attain the desired level of sustainable growth.

Owuru and Adesoji (2016) examined fiscal policy-poverty reduction nexus in Nigeria from 1980 to 2011 to explore the potency of fiscal policy in addressing the endemic poverty scourge in Nigeria, using multiple regression analysis in the autoregressive distributed lag framework with ECM. They included three major components of fiscal policy variables (Government capital expenditure, Government recurrent expenditure and Government Budget Deficit) as regressors and poverty rate as the dependent variable. They found out that the level of government capital

expenditures did not reduce the level of poverty in Nigeria over the period covered by the study. The researchers also observed that although the ECM result that showed the speed of adjustment of the model from the short run to the long run equilibrium was on the average, the economy did not show any sign of much potency in using the selected fiscal policy variables to tackle the menace of poverty in Nigeria. The recommendation was that government should intensify action in implementing effective fiscal policies to ameliorate the level of poverty conditions in Nigeria.

Ahmed, Kemal and Siddique (2015) analyzed the impact of fiscal consolidation on growth in Pakistan using annual data from 1976–2014. Their objective was to check the association of components of fiscal policy with growth. They concluded that budget deficit had non-linear association with growth and that interest payments had negative correlation with growth. They went further to note that it was extremely important to curtail both the interest payments and primary deficit. They also observed that the current tax structure was not growth enhancing and recommended that tax structure should be reformed to help the growth process and to maintain equity. They were also of the view that development expenditures should be increased with a curtailment in current expenditures so as to boost economic growth.

Agu, Okwo, Okelue and Idike (2015) examined fiscal policy and economic growth in Nigeria: Emphasis on various components of public expenditure to determine the impact of various components of fiscal policy on the Nigerian economy, using (i) descriptive statistics to show the contribution of government fiscal policy to economic growth, and to ascertain and explain growth rates and (ii) ordinary least square (OLS) in a multiple form to ascertain the relationship between economic growth and government expenditure components after ensuring data stationarity. Their findings revealed that total government expenditures had tended to increase with government revenue, with expenditures peaking faster than revenue. They observed that investment expenditures were much lower than recurrent expenditures evidencing the poor growth in the country's economy and noted that there was some evidence of positive correlation between government expenditure on economic services and economic growth. They also added that in public spending, it should be noted that the effectiveness of the private sector depends on the stability and predictability of the public incentive framework, that promotes or crowds out private investment.

Olayide (2015) studied public revenue and fiscal consolidation in Nigeria to ascertain the relationship between public revenue and expenditure and also to examine the proportion of revenue and budget deficit spent on capital projects in Nigeria using both descriptive and regression methods for the data analysis. The result showed that the regression model was well-fitted and all the explanatory variables were significant in explaining the dependent variable, government revenue. The findings also revealed that a positive relationship did exist between public revenue and expenditure in Nigeria.

Luca and Sousa (2012) in their paper on how does fiscal consolidation impact on income inequality assessed the impact of fiscal consolidation on income inequality using a panel of 18 industrialized countries from 1978 to 2009 and found out that income inequality rose significantly during periods of fiscal consolidation and that while fiscal policy driven by

spending cuts seemed to be detrimental for income distribution, tax hikes seemed to have an equalizing effect. They also showed that the size of the fiscal consolidation program (in percentage of GDP) had an impact on income inequality. They noted also that when consolidation plans represented a small share of GDP, the income gap widens, suggesting that the burden associated with the effort affected disproportionately households at the bottom of the income distribution. They also discovered that the effect on the income gap was amplified when fiscal adjustments took place after the resolution of financial turmoil, taking into consideration the linkages between banking crises and fiscal consolidation. In the same vein, fiscal consolidation programs combined with inflation, they noted, were likely to increase inequality and the effects of fiscal adjustments on inequality were amplified during periods of relatively low growth. Their results, they noted, also provided support for a non-linear relationship between inequality and income and corroborated the idea that trade could promote a more equal distribution of income.

Obi (2007) examined the potency of fiscal policy as a tool for poverty alleviation in Nigeria, using a static real-side computable general equilibrium model as the framework. He focused on three counterfactual scenarios: transfers to the poor household, targeting of government expenditure and import tariff adjustment, and observed that targeting of government expenditure seemed to be the most potent tool for effective poverty reduction, and that tariff adjustment tended to aggravate income disparity/ poverty amongst households.

Sanjeev, Benedict, Baldacci, and Carlos (2005). This paper assessed the effects of fiscal consolidation and expenditure composition on economic growth in a sample of 39 low-income countries during the 1990s and found that strong budgetary positions were generally associated with higher economic growth in short and long terms. They equally observed that the composition of public outlays is important and added that countries, where spending was concentrated on wages, tend to have lower growth, while those that allocate higher shares to capital and nonwage goods and services enjoyed faster output expansion. They concluded that initial fiscal conditions had bearing on the nexus between fiscal deficits and growth.

António, Nickel and Rother (2005) studied fiscal consolidations in the Central and Eastern European countries to ascertain what determined the probability of fiscal consolidations success in those countries. They defined consolidation events as substantive improvements in fiscal balances adjusting for the impact of cyclical effects and used Logit models for the period 1991to 2003 to assess the determinants of the success of a fiscal adjustment. Their results suggested that expenditure based consolidations had the tendency to be more successful than revenue based consolidations that tended to be less successful in those countries.

3. Methodology

Theoretical Framework
This study adopted the Keynesian theory of fiscal deficit which states that increase in government spending would positively affect the output level in an economy as the theoretical framework and followed the model employed by Gupta, et al. (2005) in examining fiscal consolidation for less-developed countries like Nigeria.

Model Specification

Economic growth is a function of components of fiscal deficit and non-fiscal control variables.

Model I

Economic Growth = f (Components of Fiscal Deficit, Non-fiscal Control Variables)

$$LOG(RGDP) = (FISCD, LOG(FDI), TOP) \tag{1}$$

$$LOG(RGDP) = b_0 + b_1 FISCD + b_2 LOG(FDI) + b_3 TOP + \mu \tag{2}$$

$$\Delta LOG(RGDP) = b_0 + b_1 FISCD_{t\text{-}1} + b_2 LOG(FDI)_{t\text{-}1} + b_3 TOP_{t\text{-}1} + \sum_{i=1}^{k} \delta_{1i} \Delta LOG(RGDP)_{t\text{-}1}$$

$$+ \sum_{i=1}^{k} \delta_{2i} \Delta FISCD_{t\text{-}1} + \sum_{i=1}^{k} \delta_{3i} \Delta TOP_{t\text{-}1} + \delta_{4i} ECM_{t\text{-}1} + \varepsilon_t \tag{3}$$

MODEL 2:

Economic Growth = f(Revenues and Expenditures, Trade openness, Foreign Direct Investment)

$$LOG(RGDP) = f(LOG(GOVEXP), LOG(GOVREV), LOG(FDI), TOP) \tag{4}$$

$$LOG(RGDP) = b_0 + b_1 LOG(GOVEXP) + b_2 LOG(GOVREV) + b_3 LOG(FDI)$$

$$+ b_4 TOP + \mu \tag{5}$$

$$\Delta LOG(RGDP) = b_0 + b_1 LOG(GOVEXP)_{t\text{-}1} + b_2 LOG(GOVREV)_{t\text{-}1} + b_3 LOG(FDI)_{t\text{-}1}$$

$$+ b_4 TOP_{t\text{-}1} + \sum_{i=1}^{k} \delta_{1i} \Delta LOG(RGDP)_{t\text{-}1} + \sum_{i=1}^{k} \delta_{2i} \Delta LOG(GOVEXP)_{t\text{-}1}$$

$$+ \sum_{i=1}^{k} \delta_{3i} \Delta LOG(GOVREV)_{t\text{-}1} + + \sum_{i=1}^{k} \delta_{4i} \Delta LOG(FDI)_{t\text{-}1}$$

$$+ \sum_{i=1}^{k} \delta_{5i} \Delta TOP_{t\text{-}1} + \delta_{6i} ECM_{t\text{-}1} + \varepsilon_t \tag{6}$$

MODEL 3:

Economic Growth = f(tax revenues and non-tax revenues; current expenditures and capital expenditures; Trade openness and Foreign direct investment)

$$LOG(RGDP) = f(LOG(GRECEX), LOG(GCAPEX), LOG(FDI), TOP) \tag{7}$$

$$LOG(RGDP) = b_0 + b_1 LOG(GRECEX) + b_2 LOG(GCAPEX) + b_3 LOG(FDI) + b_4 TOP) + \mu \tag{8}$$

$$\Delta LOG(RGDP) = b_0 + b_1 LOG(GRECEX), + b_2 LOG(GCAPEX), + b_3 LOG(FDI), + b_4 TOP$$

$$+ \sum_{i=1}^{k} \delta_{1i} \Delta LOG(RGDP)_{t\text{-}1} + \sum_{i=1}^{k} \delta_{2i} \Delta LOG(GRECEX)_{t\text{-}1}$$

$$+ \sum_{i=1}^{k} \delta_{3i} \Delta LOG(GCAPEX)_{t\text{-}1} + + \sum_{i=1}^{k} \delta_{4i} \Delta LOG(FDI)_{t\text{-}1}$$

$$+ \sum_{i=1}^{k} \delta_{5i} \Delta TOP_{t\text{-}1} + \delta_{6i} ECM_{t\text{-}1} + \varepsilon_t \tag{9}$$

MODEL 4:

Economic Growth = f(direct taxes, indirect taxes, government expenditures, trade openness and Foreign direct investment)

$$\text{LOG(RGDP)} = f(\text{LOG(DITAX)}, \text{LOG(GOVEXP)}, \text{LOG(INDTAX)}, \text{LOG(FDI)}, \text{TOP}) \quad (10)$$

$$\text{LOG(RGDP)} = b_0 + b_1\text{LOG(DITAX)} + b_2\text{LOG(GOVEXP)} + b_3\text{LOG(INDTAX)}$$

$$+ b_4\text{LOG(FDI)} + b_5\text{TOP} + \mu \quad (11)$$

$$\Delta\text{LOG(RGDP)} = b_0 + b_1\text{LOG(DITAX)} + b_2\text{LOG(GOVEXP)} + b_3\text{LOG(INDTAX)}$$

$$+ b_4\text{LOG(FDI)} + b_5\text{TOP} + \sum_{i=1}^{k} \delta_{1i}\Delta\text{LOG(RGDP)}_{t-1}$$

$$+ \sum_{i=1}^{k} \delta_{2i}\Delta\text{LOG(DITAX)}_{t-1} + \sum_{i=1}^{k} \delta_{3i}\Delta\text{LOG(GOVEXP)}_{t-1}$$

$$+ \sum_{i=1}^{k} \delta_{4i}\Delta\text{LOG(INDTAX)} + \sum_{i=1}^{k} \delta_{5i}\Delta\text{LOG(FDI)}_{t-1}$$

$$+ \sum_{i=1}^{k} \delta_{6i}\Delta\text{TOP}_{t-1} + \delta_{7i}\text{ECM}_{t-1} + \varepsilon_t \quad (12)$$

Similarly, poverty is expressed as a function of components of fiscal deficit and non-fiscal control variables.

MODEL 5

Poverty is a function of fiscal deficit components and non-fiscal control variables.

Poverty = f(fiscal deficit and non-fiscal control variables)

$$\text{LOG(PCI)} = f(\text{FISCD}, \text{LOG(GOVEXP)}, \text{LOG(GOVREV)}, \text{LOG(FDI)}, \text{TOP}) \quad (13)$$

$$\text{LOG(PCI)} = b_0 + b_1\text{FISCD} + b_2\text{LOG(GOVEXP)} + b_3\text{LOG(GOVREV)}$$

$$+ b_4\text{LOG(FDI)} + b_5\text{TOP} + \mu \quad (14)$$

$$\Delta\text{LOG(PCI)} = b_0 + b_1\text{FISCD} + b_2\text{LOG(GOVEXP)} + b_3\text{LOG(GOVREV)}$$

$$+ b_4\text{LOG(FDI)} + b_5\text{TOP} + \sum_{i=1}^{k} \delta_{1i}\Delta\text{LOG(PCI)}_{t-1}$$

$$+ \sum_{i=1}^{k} \delta_{2i}\Delta\text{FISCD}_{t-1} + \sum_{i=1}^{k} \delta_{3i}\Delta\text{LOG(GOVEXP)}_{t-1}$$

$$+ \sum_{i=1}^{k} \delta_{4i}\Delta\text{LOG(GOVREV)} + \sum_{i=1}^{k} \delta_{5i}\Delta\text{LOG(FDI)}_{t-1}$$

$$+ \sum_{i=1}^{k} \delta_{6i}\Delta\text{TOP}_{t-1} + \delta_{7i}\text{ECM}_{t-1} + \varepsilon_t \quad (15)$$

Where
RGDP = real gross domestic product
CPI = per capita income (proxy for poverty)

FISCD = fiscal deficit
FDI = foreign direct investment
TOP = trade openness
GOVEXP = government expenditure
GOVREV = government revenue
GRECEX = government current expenditure
GCAPEX = government capital expenditure
DITAX = direct taxes
INDTAX indirect taxes

$b_0 =$ the drift; b_1- b_5 = Long run multipliers or parameters to be estimated, ε_t = Error Term; and δ_1 to δ_6 are the short run dynamic multipliers while δ_{4i}, δ_{6i}, and δ_{7i} are the speed of adjustment to equilibrium.
A priori expectation: $b_1 > 0$, $b_2 > 0$, $b_3 > 0$, $b_4 > 0$ and $b_5 > 0$.

Method of Evaluation
The study adopted econometric methodology that includes the theoretical criteria or a priori test, statistical or first-order and econometric or second order tests in the data analysis. Unit root test, cointegration test were used to carry out the pre-estimation tests of the time series data. Autoregressive distributed lag (ARDL) bounds test technique and Granger causality approaches were engaged in analyzing the work.

Unit Root Test for Stationarity
The variables in the model were tested and corrected for stationarity using Augmented Dickey-Fuller (ADF) unit root test. The essence is to ascertain the unit root properties of the single series, that is, the order of integration of the variables in the model and to ensure that the variables in the model are void of seasonal variation and also to avoid spurious regression result. The unit root procedure requires estimating the following ADF equation:

$$\Delta Y_t = \alpha_0 + \eta Y_{t-1} + \sum_{t=1}^{k} B_i \Delta Y_{t-i} + U_t.$$

Where
$\Delta Y_t = Y_t - Y_{t-1}$ is the difference of series
$Y_t . \Delta Y_{t-1} = Y_{t-1} - Y_{t-2}$ is the first difference of Y_{t-1}.
α_0, η, and B_i are parameters to be estimated and U_t is stochastic error term.
The null hypothesis of non stationarity (presence of unit root) is accepted if $\eta = 0$ while the null hypothesis of non stationarity is rejected if $\eta < 0$.

Co-integration Test
The model was tested for co-integration using ARDL bounds test to determine whether long run relationship exist between the dependent and independent variables in the models, that is, whether the variables move together over time. If evidence of co-integration is established in the models, error correction mechanism (ECM) would be introduced in the model(s) as one of the independent variables.

Granger Causality Test

Granger causality test was employed to check the direction of causality relationship between the dependent and the explanatory variables in the model. In Engle and Granger (1987) if two variables are cointegrated, the possibility of causality between the two exists, at least in one direction. Granger causality test for the series could be expressed in general form as follows:

$$Y_t = \sum_{i=1}^{k} \delta_{11i}Y_{t-1} + \sum_{i=1}^{k} \delta_{12i}Y_{t-1} + U_{1t}$$

$$X_t = \sum_{i=1}^{k} \delta_{21i}Y_{t-1} + \sum_{i=1}^{k} \delta_{22i}Y_{t-1} + U_{2t}$$

Where Y = dependent variable, X = independent variables in the model, t = the current period of the variables and t-i = the lagged period of the variables, δ_{11} to δ_{22} = the coefficients of the lagged variables and U_1 and U_2 = mutually uncorrelated white noise error terms. The Granger causality analysis decision rule follows F-distribution. Therefore, rejected null hypothesis if the p(F-statistic) < 0.05; otherwise accept.

Data Sources

Annual time series secondary data on real gross domestic product, per capita income (proxy for poverty), fiscal deficit, foreign direct investment, trade openness, government expenditure, government revenue, government current expenditure, government capital expenditure, direct and indirect taxes sourced from CBN statistical bulletin 2018 and the World Bank Development Indicator (WDI) were used in this work. The study covered the period 1981 to 2018. Eviews 9 econometric software was employed in estimating the specified models.

4. RESULTS AND DISCUSSION

Unit Root Test

The result of the Augmented Dickey-Fuller unit root test conducted on all the variables in the models is presented in Table 4.1 below.

Table 4.1: Result of ADF Unit Root Test

Variables	ADF Statistics	Critical Value (5%)	Probability	Order of Integration
LOG(RGDP)	-3.502856	-2.945842	0.0136	I (1)
FISCD	-2.988310	-2.943427	0.0453	I (0)
LOG(FDI)	-3.003624	-2.948404	0.0443	I (0)
TOP	-4.595434	-2.943427	0.0007	I (0)
LOG(GOVEXP)	-4.063858	-2.948404	0.0033	I (0)
LOG(GOVREV)	-3.165443	-2.948404	0.0308	I(0)
LOG(GRECEX)	-3.135972	-2.945842	0.0327	I(0)
LOG(GCAPEX)	-4.846608	-2.948404	0.0004	I (1)
LOG(DITAX)	-5.793635	-2.945842	0.0000	I (1)
LOG(INDTAX)	-5.645867	-2.945842	0.0000	I (1)
LOG(CPI)	-4.417122	-2.945842	0.0012	I (1)

Source: Researcher's computation using E-views 9

The result showed that fiscal deficit (FISCD), foreign direct investment LOG(FDI), trade openness (TOP), government expenditure (LOG(GOVEXP)), government revenue (LOG(GOVREV)), and government current expenditure (LOG(GRECEX)) are integrated of order zero, I(0), while real gross domestic product (LOG(RGDP)), government capital expenditure LOG(GCAPEX), direct taxes (LOG(DITAX)), indirect taxes (LOG(INDTAX)), and per capital income (LOG(CPI)) are stationary at first difference, I(1). None of the variables is of I (2).

Cointegration Test Result
Table 4. 2 below shows the results of ARDL Bounds Test for co-integration of models I – IV.

Table 4.2: ARDL Bounds Tests Results

Model	F-statistic	K	Critical Value Bounds			Outcome
			Significant Level	I0 Bound	I1 Bound	
Model I	1.796487	3	5%	3.23	4.35	No co-integration
Model II	1.622624	4	5%	2.86	4.01	No co-integration
Model III	4.056367	4	5%	2.86	4.01	Co-integration
Model IV	6.636446	5	5%	2.62	3.79	Co-integration
Model V	2.718050	5	5%	2.62	3.79	Inconclusive

Source: Author's computation from E-view 9

The bounds test result of model I showed computed F-Statistic value of 1.741982 which lies below the lower bounds critical value of 3.23 at 5% level of significance. In view of this, the null hypothesis of no co-integration is not rejected. This implies that the variables in the model are not co-integrated. In other words, there is no long run relationship among the variables in the model. For model II, F-Statistic value is 1.622624. This is below the lower bounds critical value of 2.86 at 5% level of significance and indicates that the variables in the model are not co-integrated; there is no long run relationship among the variables. The F-Statistic values of models III and IV are 4.056367 and 6.636446 respectively. They are greater than the upper bounds values, 4.01 and 3.79, of the two models respectively and showed that co-integration or long run relationship exists among the variables in the said models. Similarly, the bounds test result of model V showed computed F-Statistic value of 2.718050 that is in-between the lower bounds critical value of 2.62 and the upper bounds critical value of 3.79 at 5% level of significance. This shows that the result is inconclusive. Thus, co-integration may or may not exist among the variables in the model.

4.2 Model Selection Method
The ARDL model selection of the five models was achieved through Akaike Information Criterion (AIC) which established the optimal lag length for the dependent and independent variables in the models, by automatic selection, the ARDL(4, 4, 4, 1), ARDL(2, 4, 0, 2, 0), ARDL(3, 3, 4, 4, 3), ARDL(4, 1, 4, 4, 4, 4) and ARDL(4, 2, 0, 0, 4, 2) for models I, II, III, IV and V respectively, after 20 models automatically generated.

Regression Model Result

The results of the regression models are presented as follows:

ARDL Cointegrating and Long Run Form models
Model I

ARDL Cointegrating And Long Run Form				
Dependent Variable: LOG(RGDP)				
Selected Model: ARDL(4, 4, 4, 1)				
Date: 05/23/20 Time: 18:43				
Sample: 1981 2018				
Included observations: 34				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(RGDP(-1))	0.781333	0.191009	4.090557	0.0008
DLOG(RGDP(-2))	-0.287743	0.198128	-1.452312	0.1646
DLOG(RGDP(-3))	0.210272	0.167418	1.255975	0.2261
D(FISCD)	0.000949	0.000403	2.353523	0.0309
D(FISCD(-1))	-0.000815	0.000543	-1.500819	0.1517
D(FISCD(-2))	0.001000	0.000476	2.101403	0.0508
D(FISCD(-3))	-0.001224	0.000407	-3.006603	0.0079
DLOG(FDI)	-0.012672	0.011250	-1.126407	0.2756
DLOG(FDI(-1))	0.034918	0.011697	2.985095	0.0083
DLOG(FDI(-2))	-0.032448	0.012411	-2.614386	0.0181
DLOG(FDI(-3))	0.014892	0.009762	1.525440	0.1455
D(TOP)	0.000034	0.000056	0.617155	0.5453
CointEq (-1)	-0.040189	0.022561	-1.781358	0.0927
Cointeq = LOG(RGDP) - (0.0390*FISCD -0.0039*LOG(FDI) + 0.0024*TOP +				
2.4399)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FISCD	0.039013	0.018240	2.138916	0.0473
LOG(FDI)	-0.003857	0.142343	-0.027095	0.9787
TOP	0.002406	0.001851	1.299955	0.2110
C	2.439909	0.352469	6.922331	0.0000

Source: Author's computation from E-view 9

Model I is estimated to basically examine the impact of fiscal deficit and non – fiscal control variables (foreign direct investment and trade openness) on economic growth in Nigeria. The result, as in Model I above, indicated that fiscal deficit (FISCD) has positive relationship with and statistically significant impact on economic growth in Nigeria in the long run as indicated by its coefficient of 0.039013, t-statistic and probability values of 2.138916 and 0.0473 respectively. This implies that, in the long run, one percent increase in fiscal deficit would lead to about 0.039 percent increase in real gross domestic product in Nigeria. In other words, fiscal deficit significantly impacts economic growth in Nigeria. This indicates the need for fiscal consolidation to control deficit and to enhance economic growth in the country. Fiscal consolidation, if carried out through reduction in expenditures, would achieve success more than through revenue based fiscal consolidation even though increasing revenues equally reduces fiscal deficit. The results also showed that trade openness is positively related with RGDP while foreign direct investment is negatively related with RGDP and that they have no significant impact on economic growth in the Nigeria over the period studied as indicated by their t – statistic and probability values which are greater than 5%. The result also indicated that the value of coefficient of error correction term or the cointegration equation is negative -0.040189 as desired but statistically insignificant as indicated by its probability value of 0.0927 which is higher than 0.05 or 5% thus confirming that there was no long run association among the variables in the model. The coefficient value of 4.02 percent means that the system corrects the previous period disequilibrium at a speed of 4.02 percent per year.

Model II

Model II is estimated to separately examine the impact of total expenditures and total revenues on economic growth in Nigeria.

ARDL Cointegrating And Long Run Form				
Dependent Variable: LOG(RGDP)				
Selected Model: ARDL(2, 4, 0, 2, 0)				
Date: 05/23/20 Time: 19:06				
Sample: 1981 2018				
Included observations: 34				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(RGDP(-1))	0.559811	0.155550	3.598922	0.0017
DLOG(GOVEXP)	-0.034191	0.018652	-1.833139	0.0810
DLOG(GOVEXP(-1))	-0.004561	0.019735	-0.231119	0.8195
DLOG(GOVEXP(-2))	-0.053599	0.015181	-3.530527	0.0020
DLOG(GOVEXP(-3))	0.023749	0.013031	1.822552	0.0826
DLOG(GOVREV)	0.015084	0.010817	1.394480	0.1778
DLOG(FDI)	0.005600	0.010246	0.546544	0.5905
DLOG(FDI(-1))	0.032048	0.009927	3.228295	0.0040
D(TOP)	0.000010	0.000046	0.224158	0.8248
CointEq(-1)	-0.039504	0.022241	-1.776157	0.0902
Cointeq = LOG(RGDP) - (-0.2496*LOG(GOVEXP) + 0.3818*LOG(GOVREV)				
-0.2506*LOG(FDI) + 0.0003*TOP + 2.7243)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GOVEXP)	-0.249596	0.408140	-0.611546	0.5474
LOG(GOVREV)	0.381824	0.380654	1.003074	0.3272
LOG(FDI)	-0.250631	0.334270	-0.749788	0.4617
TOP	0.000262	0.001143	0.229380	0.8208
C	2.724270	0.532079	5.120048	0.0000

The result showed that total government expenditure has negative relationship with and insignificant impact on real gross domestic product both in the long run and short run. Government total revenue, on the other hand, showed positive relationship with but insignificant impact on real gross domestic product both in the long run and short run.

Model III

The impact of components of total expenditures – government recurrent and capital expenditures – on economic growth is examined in model III.

ARDL Cointegrating And Long Run Form				
Dependent Variable: LOG(RGDP)				
Selected Model: ARDL(3, 3, 4, 4, 3)				
Date: 05/23/20 Time: 19:23				
Sample: 1981 2018				
Included observations: 34				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(RGDP(-1))	0.413462	0.185629	2.227351	0.0458
DLOG(RGDP(-2))	-0.274142	0.180771	-1.516513	0.1553
DLOG(GRECEX)	0.013437	0.013528	0.993223	0.3402
DLOG(GRECEX(-1))	-0.015019	0.012572	-1.194628	0.2553
DLOG(GRECEX(-2))	-0.012275	0.008775	-1.398838	0.1872
DLOG(GCAPEX)	-0.023196	0.010278	-2.256806	0.0435
DLOG(GCAPEX(-1))	0.024278	0.008131	2.986081	0.0114
DLOG(GCAPEX(-2))	-0.028656	0.009903	-2.893625	0.0135
DLOG(GCAPEX(-3))	0.007919	0.006883	1.150645	0.2723
DLOG(FDI)	-0.030688	0.014503	-2.115968	0.0559
DLOG(FDI(-1))	0.018611	0.014376	1.294639	0.2198
DLOG(FDI(-2))	-0.015578	0.011624	-1.340170	0.2050
DLOG(FDI(-3))	0.023755	0.012431	1.910923	0.0802
D(TOP)	-0.000014	0.000042	-0.323452	0.7519
D(TOP(-1))	0.000058	0.000057	1.028171	0.3241
D(TOP(-2))	0.000121	0.000053	2.286435	0.0412
CointEq(-1)	-0.106082	0.033128	-3.202194	0.0076
Cointeq = LOG(RGDP) - (0.3929*LOG(GRECEX) - 0.2121*LOG(GCAPEX)				
-0.2380*LOG(FDI) -0.0018*TOP + 2.6091)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GRECEX)	0.392949	0.072061	5.453002	0.0001
LOG(GCAPEX)	-0.212102	0.096346	-2.201467	0.0480
LOG(FDI)	-0.238009	0.199908	-1.190596	0.2568
TOP	-0.001821	0.001624	-1.121592	0.2840
C	2.609150	0.296742	8.792654	0.0000

The result revealed that government recurrent (LOG(GRECEX)) and capital expenditures (LOG(GCAPEX)) impact significantly on economic growth in Nigeria in the long run. In the short run, capital expenditure of government has significant impact on growth while recurrent expenditure has not. The result also indicated that the coefficient of error correction mechanism (ECM) is -0.106082 and statistically significant with probability value of 0.0076 and indicates that approximately 10.6% of any movement into disequilibrium is corrected back to the long run equilibrium within one year. The speed of adjustment to equilibrium for the model is low.

Model IV

Model IV examined the impact of components of tax revenue (direct and indirect taxes) on economic growth in Nigeria.

ARDL Cointegrating And Long Run Form				
Dependent Variable: LOG(RGDP)				
Selected Model: ARDL(4, 1, 4, 4, 4, 4)				
Date: 05/23/20 Time: 19:37				
Sample: 1981 2018				
Included observations: 34				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(RGDP(-1))	0.169526	0.219394	0.772700	0.4650
DLOG(RGDP(-2))	0.273341	0.208353	1.311910	0.2309
DLOG(RGDP(-3))	0.354761	0.152001	2.333945	0.0523
DLOG(DITAX)	-0.082132	0.034014	-2.414644	0.0465
DLOG(GOVEXP)	-0.003475	0.031001	-0.112085	0.9139
DLOG(GOVEXP(-1))	0.041767	0.026682	1.565369	0.1615
DLOG(GOVEXP(-2))	-0.069194	0.013035	-5.308458	0.0011
DLOG(GOVEXP(-3))	-0.051225	0.030482	-1.680511	0.1367
DLOG(INDTAX)	-0.029139	0.022217	-1.311590	0.2310
DLOG(INDTAX(-1))	-0.092816	0.046267	-2.006095	0.0849
DLOG(INDTAX(-2))	0.155722	0.056855	2.738940	0.0290
DLOG(INDTAX(-3))	-0.156800	0.040788	-3.844281	0.0063
DLOG(FDI)	0.048597	0.020226	2.402732	0.0473
DLOG(FDI(-1))	-0.032791	0.024873	-1.318364	0.2289
DLOG(FDI(-2))	0.003300	0.011953	0.276060	0.7905
DLOG(FDI(-3))	0.043623	0.018572	2.348839	0.0512
D(TOP)	-0.000088	0.000045	-1.965239	0.0901
D(TOP(-1))	0.000094	0.000077	1.223324	0.2608
D(TOP(-2))	0.000331	0.000093	3.546854	0.0094
D(TOP(-3))	0.000187	0.000069	2.704977	0.0304
CointEq(-1)	-0.186359	0.047934	-3.887841	0.0060
Cointeq = LOG(RGDP) - (-0.2915*LOG(DITAX) + 0.0780*LOG(GOVEXP) +				

0.1732*LOG(INDTAX) + 0.2485*LOG(FDI) -0.0046*TOP + 2.0935)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(DITAX)	-0.291516	0.189144	-1.541238	0.1672
LOG(GOVEXP)	0.077982	0.123367	0.632117	0.5474
LOG(INDTAX)	0.173226	0.080385	2.154960	0.0681
LOG(FDI)	0.248455	0.210578	1.179872	0.2766
TOP	-0.004609	0.001783	-2.584943	0.0362
C	2.093546	0.467494	4.478226	0.0029

Model IV examined the impact of components of tax revenue (direct and indirect taxes) on economic growth in Nigeria. Results revealed that direct tax related negatively with economic growth in the short and long run, and that its impact on growth is statistically significant in short run and insignificant in long run. This show that, in the short run, one percent increase in direct tax would lead to about 0.082 percent decrease in real gross domestic product. The result further revealed that indirect tax impacts significantly on growth in the long run and that it positively relates with economic growth in Nigeria. The result also indicated that the coefficient of error correction mechanism (ECM) is -0.186359 and statistically significant with probability value of 0.0060, indicating that approximately 18.64% of any movement into disequilibrium is corrected back to the long run equilibrium within a year. The speed of adjustment to equilibrium for the model is low.

Model V below examined the impact of fiscal consolidation on poverty reduction in Nigeria through fiscal components and non – fiscal control variables.

Model V

ARDL Cointegrating And Long Run Form				
Dependent Variable: LOG(PCI)				
Selected Model: ARDL(4, 2, 0, 0, 4, 2)				
Date: 06/21/20 Time: 14:57				
Sample: 1981 2018				
Included observations: 34				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(PCI(-1))	-0.328897	0.100926	-3.258797	0.0049
DLOG(PCI(-2))	-0.474227	0.106964	-4.433537	0.0004
DLOG(PCI(-3))	-0.513927	0.104958	-4.896489	0.0002
D(FISCD)	-0.000896	0.002270	-0.394881	0.6981
D(FISCD(-1))	-0.014521	0.002045	-7.101768	0.0000
DLOG(GOVEXP)	-0.249678	0.090853	-2.748157	0.0143
DLOG(GOVREV)	0.476780	0.071414	6.676297	0.0000
DLOG(FDI)	-0.028979	0.006986	-4.148424	0.0008
DLOG(FDI(-1))	0.007309	0.005891	1.240585	0.2326
DLOG(FDI(-2))	0.013204	0.005644	2.339548	0.0326
DLOG(FDI(-3))	0.009102	0.006470	1.406692	0.1786
D(TOP)	0.000591	0.000218	2.713186	0.0154
D(TOP(-1))	-0.000403	0.000243	-1.661893	0.1160
CointEq(-1)	-0.265011	0.037451	-7.076113	0.0000
Cointeq = LOG(PCI) - (0.0711*FISCD -0.9421*LOG(GOVEXP) + 1.7991				
*LOG(GOVREV) -0.1664*LOG(FDI) + 0.0065*TOP + 1.9410)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FISCD	0.071055	0.009401	7.557982	0.0000
LOG(GOVEXP)	-0.942143	0.398037	-2.366975	0.0309
LOG(GOVREV)	1.799096	0.340052	5.290646	0.0001
LOG(FDI)	-0.166445	0.034159	-4.872575	0.0002
TOP	0.006497	0.001563	4.157384	0.0007
C	1.941041	0.115997	16.733489	0.0000

The results obtained showed that in the short run, the values of per capita income (proxy for poverty) in lags one, two and three have statistically significant impact on the current year per capita income as shown by their t – statistic and probability values. The result also showed that

the current period fiscal deficit has no significant impact on poverty reduction. However, the fiscal deficit lag one was found to have statistically significant impact on poverty. Government expenditure, government revenue, foreign direct investment, and trade openness were found to show statistically significant impact on poverty reduction in Nigeria in the short run as indicated by their t – statistic and probability values.

The result further revealed that fiscal deficit (FISCD), government expenditure (LOG (GOVEXP)), government revenue (LOG(GOVREV)), foreign direct investment (LOG(FDI)), and trade openness (TOP) have statistically significant impact on poverty reduction in Nigeria in the long run as indicated by their t – statistic and probability values. A percentage increase in fiscal deficit would raise poverty by 0.07 percent. One percent increase in government expenditure would lead to about 0.94 percent reduction in poverty in the long run. A percentage rise in government revenue results in approximately 1.8 percent increase in poverty level. One percent increase in foreign direct investment would cause poverty to reduce by about 0.17 percent in the long run while a similar increase in trade openness would increase poverty level by about 0.006 percentage.

The result further indicated that the coefficient of error correction mechanism (ECM) is negative (-0.265011) and statistically significant (probability value = 0.0000) as required, indicating that approximately 26.5% of any movement into disequilibrium is corrected back to the long run equilibrium within a year. The speed of adjustment to equilibrium for the model is low.

Post Estimation Analysis:

Serial Correlation Test
Serial correlation test was conducted to ascertain whether or not the residuals from models I, II, III and IV are serially correlated.

Breusch-Godfrey Serial Correlation LM Test Model
Model 1

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.359308	Prob. F(2,15)	0.2867
Obs*R-squared	5.216713	Prob. Chi-Square(2)	0.0737

Model II

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.192048	Prob. F(2,19)	0.3253
Obs*R-squared	3.790634	Prob. Chi-Square(2)	0.1503

Model III

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.934578	Prob. F(2,10)	0.4245
Obs*R-squared	5.354326	Prob. Chi-Square(2)	0.0688

Model IV

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.914592	Prob. F(2,5)	0.1449
Obs*R-squared	18.30168	Prob. Chi-Square(2)	0.0001

Model V

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.454624	Prob. F(2,14)	0.6437
Obs*R-squared	2.073507	Prob. Chi-Square(2)	0.3546

Breusch-Godfrey Serial Correlation LM Test carried out to determine if the residuals from the models are serially correlated showed Obs*R-squared p-values of 0.0737, 0.1503, 0.0688, 0.3546 greater than 0.05 significant level for models I, II, III, and V meaning that there is no serial correlation in the respective models, and 0.0001 less than 0.05 level of significance for model IV, indicating presence of serial correlation in the model.

Ramsey RESET Test
Ramsey RESET Test is conducted to check specification errors in models I, II, III, IV and V presented below.

Model 1

Ramsey RESET Test				
	Value	Df	Probability	
t-statistic	1.409110	16	0.1779	
F-statistic	1.985590	(1, 16)	0.1779	
Likelihood ratio	3.977394	1	0.0461	

Model II

Ramsey RESET Test				
	Value	df	Probability	
t-statistic	1.155890	20	0.2613	
F-statistic	1.336082	(1, 20)	0.2613	
Likelihood ratio	2.198690	1	0.1381	

Model III

Ramsey RESET Test				
	Value	Df	Probability	
t-statistic	2.337403	11	0.0394	
F-statistic	5.463451	(1, 11)	0.0394	
Likelihood ratio	13.71042	1	0.0002	

Model IV

Ramsey RESET Test				
	Value	Df	Probability	
t-statistic	1.612540	6	0.1580	
F-statistic	2.600285	(1, 6)	0.1580	
Likelihood ratio	12.24122	1	0.0005	

Model V

Ramsey RESET Test			
	Value	df	Probability
t-statistic	1.836392	15	0.0862
F-statistic	3.372335	(1, 15)	0.0862

The result indicated f – statistic probability values of 0.1779, 0.2613, 0.1580 and 0.0862 that are greater than 0.05 in each case for models I, II, IV and V respectively. This indicates that the estimated models I, II, IV and V were respectively correctly specified. The Ramsey RESET Test result, however, indicated that model III was not correctly specified as shown by the f – statistic probability values of 0.0394 which is less than 0.05.

Normality Test
Jarque-Bera Normality Test was conducted on all the models to see if residuals of these models followed normal distribution.
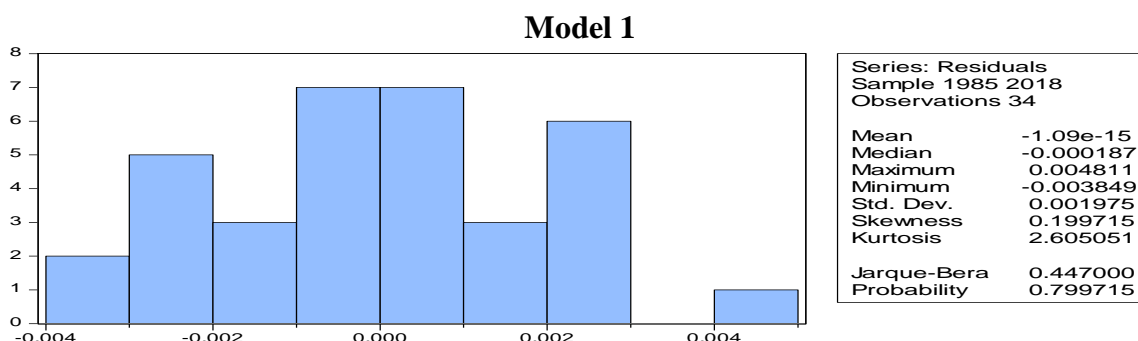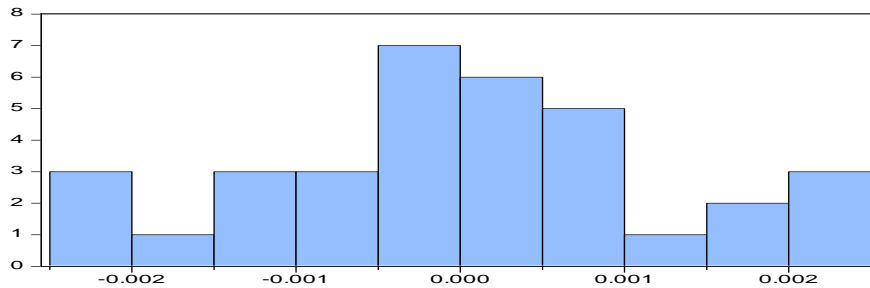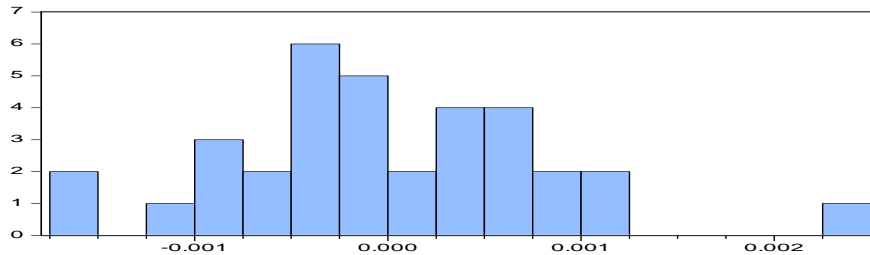
Model 1
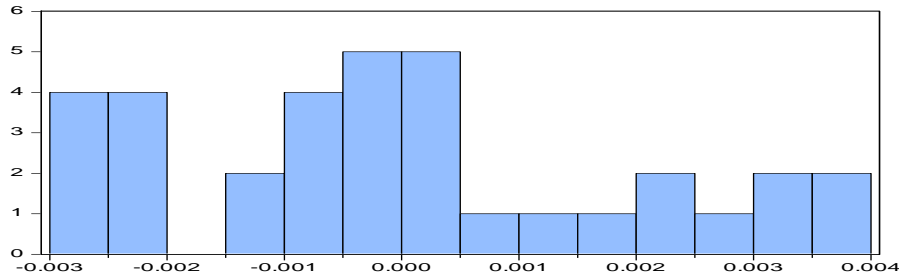
Model II

Series: Residuals	
Sample 1985 2018	
Observations 34	
Mean	-9.80e-16
Median	-0.000295
Maximum	0.003735
Minimum	-0.002975
Std. Dev.	0.001976
Skewness	0.385730
Kurtosis	2.163919
Jarque-Bera	1.833423
Probability	0.399832

Model III

Series: Residuals	
Sample 1985 2018	
Observations 34	
Mean	2.61e-16
Median	6.47e-06
Maximum	0.002274
Minimum	-0.002413
Std. Dev.	0.001217
Skewness	-0.064445
Kurtosis	2.498470
Jarque-Bera	0.379872
Probability	0.827012

Model IV

Series: Residuals	
Sample 1985 2018	
Observations 34	
Mean	2.96e-16
Median	-6.86e-05
Maximum	0.002312
Minimum	-0.001614
Std. Dev.	0.000801
Skewness	0.362996
Kurtosis	3.702750
Jarque-Bera	1.446309
Probability	0.485219

Model V
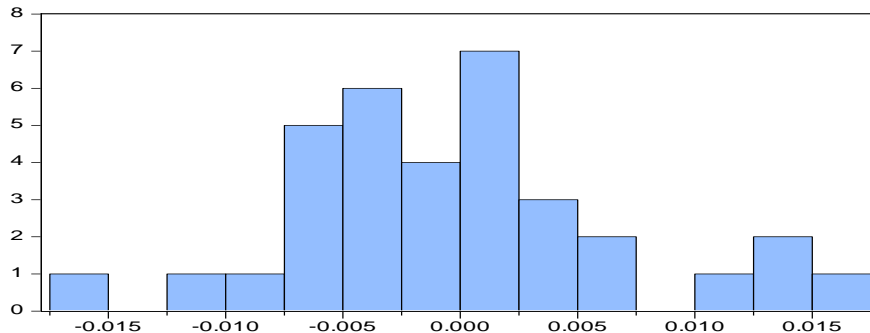
Series: Residuals	
Sample 1985 2018	
Observations 34	
Mean	-2.34e-16
Median	-0.000242
Maximum	0.015563
Minimum	-0.016050
Std. Dev.	0.007125
Skewness	0.412432
Kurtosis	3.198972
Jarque-Bera	1.019984
Probability	0.600500

Source: Eviews 9 Regression Output

The result of Jarque-Bera Test indicated Jarque – Bera probability of 0.799715, 0.39982, 0.827012, 0.485219 and 0.600500 which are respectively greater than 0.05 in each case, meaning that the residuals followed normal distribution.

Heteroskedasticity Test

Heteroskedasticity test for the models was conducted using the Breusch-Pagan-Godfrey Heteroskedasticity Tests in which the residuals follow the chi-square distribution with degree of freedom equal to the number of regressors (excluding the constant). The Hypothesis is

H_0: $B_1 = B_2 = B_3 = 0$ (Homoscedasticity). H_1: $B_1 = B_2 = B_3 \neq 0$ (Heteroscedasticity)

Table 4.7 Breusch-Pagan-Godfrey Heteroskedasticity Tests
Model I

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.598728	Prob. F(16,17)	0.1733
Obs*R-squared	20.42544	Prob. Chi-Square(16)	0.2017
Scaled explained SS	4.097982	Prob. Chi-Square(16)	0.9987

Model II

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.761714	Prob. F(12,21)	0.6807
Obs*R-squared	10.31099	Prob. Chi-Square(12)	0.5887
Scaled explained SS	2.289150	Prob. Chi-Square(12)	0.9988

Model III

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.403213	Prob. F(21,12)	0.2764
Obs*R-squared	24.16096	Prob. Chi-Square(21)	0.2853
Scaled explained SS	2.254950	Prob. Chi-Square(21)	1.0000

Model IV

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.457818	Prob. F(26,7)	0.9305
Obs*R-squared	21.40958	Prob. Chi-Square(26)	0.7205
Scaled explained SS	1.226372	Prob. Chi-Square(26)	1.0000

Model V

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.286072	Prob. F(17,16)	0.9928
Obs*R-squared	7.925418	Prob. Chi-Square(17)	0.9681
Scaled explained SS	1.929718	Prob. Chi-Square(17)	1.0000

The result of heteroskedasticity test on models I, II, III, IV and V revealed that the residuals are homoscedastic since the Prob. Chi-Square values of 0.2017, 0.5887, 0.2853, 0.7205 and 0.9681 of respective models are greater than 0.05 level of significance. This means that heteroscedasticity is not present in the regression results.

Summary of diagnostic tests for the models:

| Model	Test	F-statistic/Obs*R-squared	Probability
Model I	Breusch-Godfrey Serial Correlation LM Test:	5.216713	0.0737
	Ramsey RESET Test	1.985590	0.1779
	Jarque-Bera Normality	0.447000	0.799715
	Heteroskedasticity Test: Breusch-Pagan-Godfrey	20.42544	0.2017
Model II	Breusch-Godfrey Serial Correlation LM Test:	3.790634	0.1503
	Ramsey RESET Test	1.336082	0.2613
	Jarque-Bera Normality	1.83342	0.39982
	Heteroskedasticity Test: Breusch-Pagan-Godfrey	10.31099	0.5887
Model III	Breusch-Godfrey Serial Correlation LM Test:	5.354326	0.0688
	Ramsey RESET Test	5.463451	0.0394
	Jarque-Bera Normality	0.79872	0.827012
	Heteroskedasticity Test: Breusch-Pagan-Godfrey	24.16096	0.2853
Model IV	Breusch-Godfrey Serial Correlation LM Test:	18.30168	0.0001
	Ramsey RESET Test	2.600285	0.1580
	Jarque-Bera Normality	1.446309	0.485219
	Heteroskedasticity Test: Breusch-Pagan-Godfrey	21.40958	0.7205
Model V	Breusch-Godfrey Serial Correlation LM Test:	2.073507	0.3546
	Ramsey RESET Test	3.372335	0.0862
	Jarque-Bera Normality	1.019984	0.600500
	Heteroskedasticity Test: Breusch-Pagan-Godfrey	7.925418	0.9681

Stability Tests (CUSUM and CUSUMSQ) of the Model

The plot of stability tests (CUSUM and CUSUMSQ) of the models are presented below. The CUSUM and CUSUMSQ are plotted against the critical bounds at 5% level of significance.
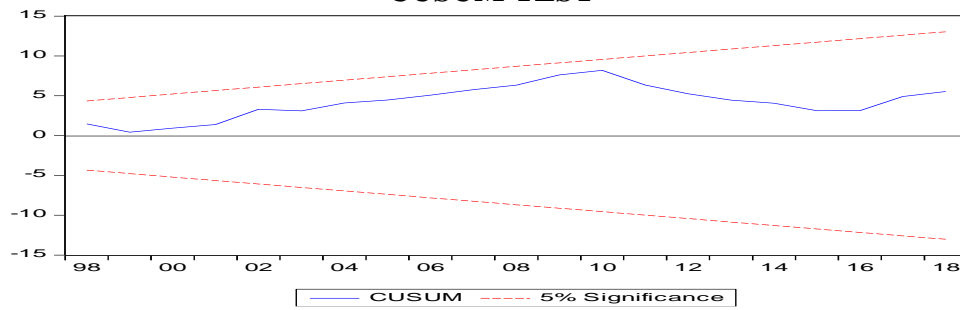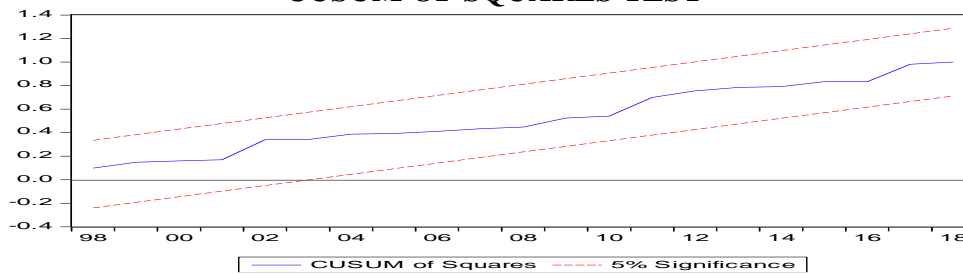
Model 1
CUSUM TEST
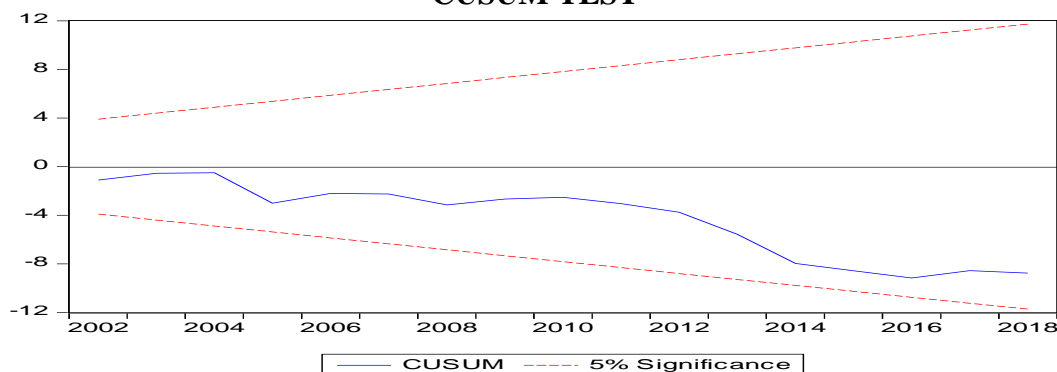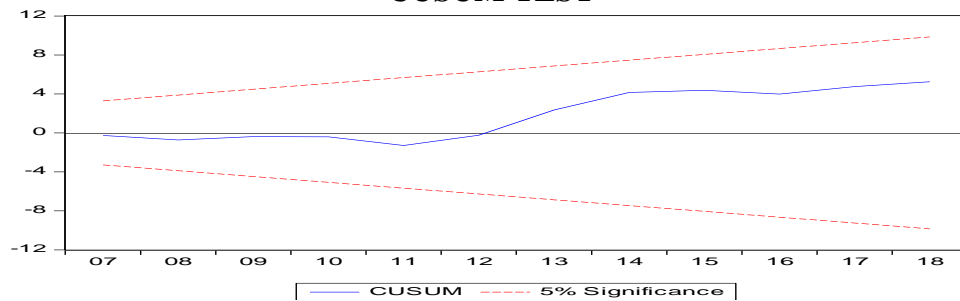
CUSUM OF SQUARES TEST
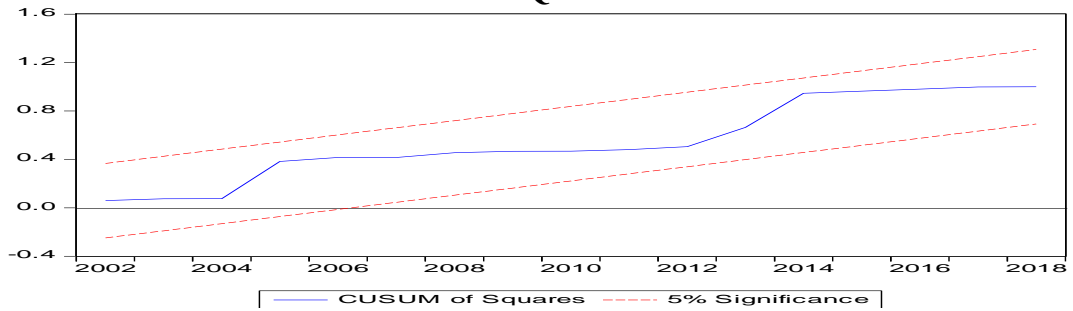
Model II
CUSUM TEST

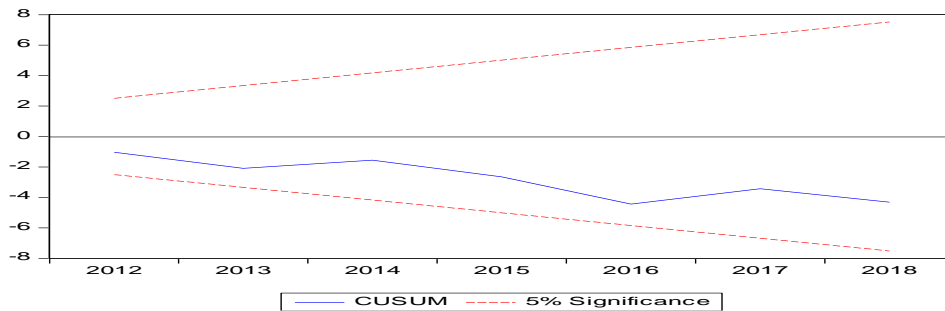
CUSUM OF SQUARES TEST

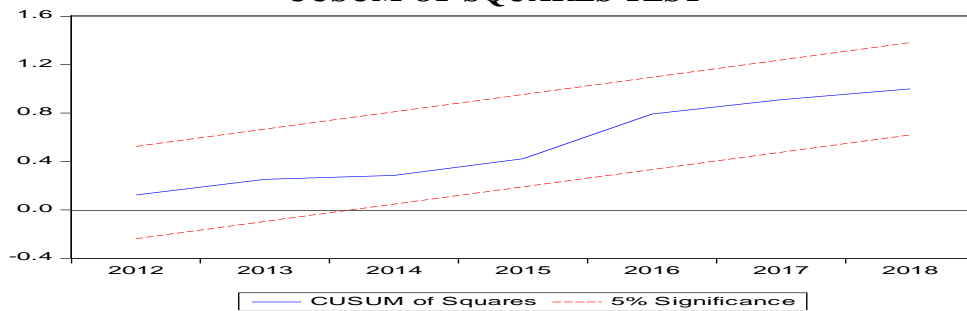### Model III

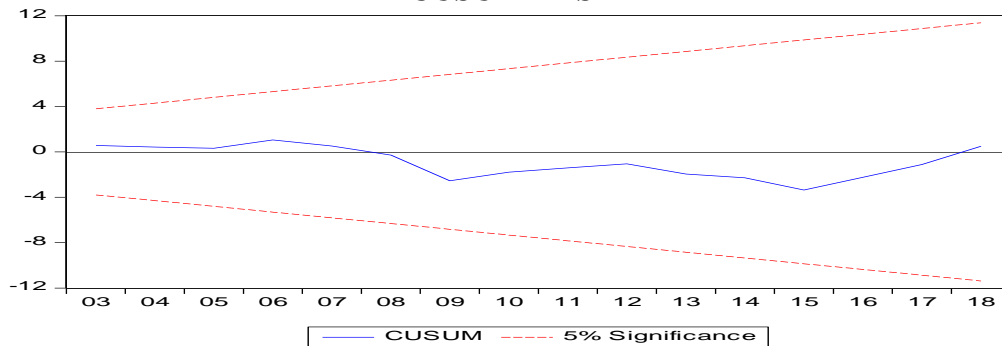## CUSUM TEST

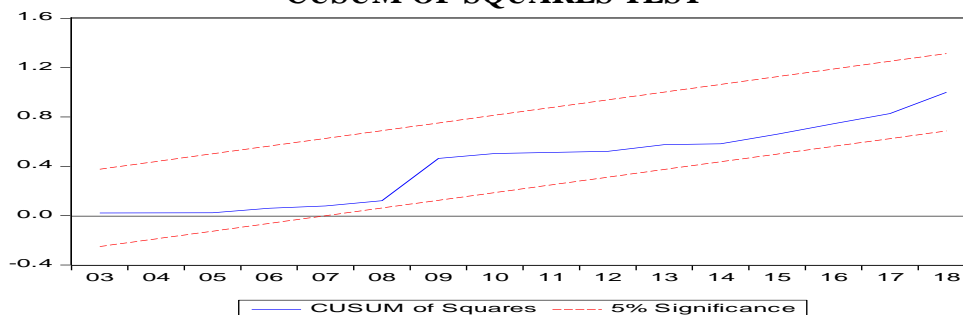## CUSUM OF SQUARES TEST
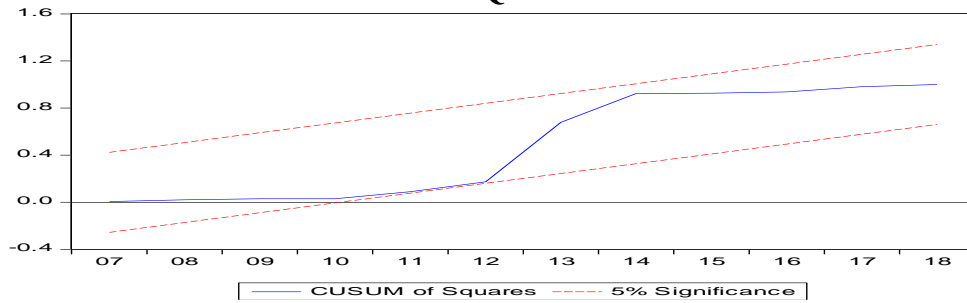
Model IV
CUSUM TEST

CUSUM OF SQUARES TEST

Model V
CUSUM TEST

CUSUM OF SQUARES TEST

The results indicated that the models are stable as the critical bounds at 5% fell in between the two 5% lines. This is further confirmed by the CUSUM OF SQUARES TEST.

Granger Causality Test

The decision rule for Granger causality analysis follows F-distribution. The result of Granger causality test conducted to determine the causality relationship between real gross domestic product (proxy for economic growth) and fiscal deficit and between poverty reduction and fiscal deficit are presented as follows:

Model I

Pairwise Granger Causality Tests			
Date: 05/23/20 Time: 18:55			
Sample: 1981 2018			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
FISCD does not Granger Cause LOG(RGDP)	36	0.94890	0.3981
LOG(RGDP) does not Granger Cause FISCD		0.97029	0.3902
LOG(FDI) does not Granger Cause LOG(RGDP)	36	2.96363	0.0664
LOG(RGDP) does not Granger Cause LOG(FDI)		0.20083	0.8191
TOP does not Granger Cause LOG(RGDP)	36	0.14780	0.8632
LOG(RGDP) does not Granger Cause TOP		6.77060	0.0036
LOG(FDI) does not Granger Cause FISCD	36	0.23935	0.7886
FISCD does not Granger Cause LOG(FDI)		0.83249	0.4445
TOP does not Granger Cause FISCD	36	0.14089	0.8691
FISCD does not Granger Cause TOP		0.16319	0.8502
TOP does not Granger Cause LOG(FDI)	36	1.68112	0.2027
LOG(FDI) does not Granger Cause TOP		2.69593	0.0833

Source: Eviews 9 Regression Output

Model V

Pair wise Granger Causality Tests			
Date: 06/21/20 Time: 15:00			
Sample: 1981 2018			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
FISCD does not Granger Cause LOG(PCI)	36	1.13894	0.3332
LOG(PCI) does not Granger Cause FISCD		0.93531	0.4033
LOG(GOVEXP) does not Granger Cause LOG(PCI)	36	6.09553	0.0059
LOG(PCI) does not Granger Cause LOG(GOVEXP)		2.05698	0.1449
LOG(GOVREV) does not Granger Cause LOG(PCI)	36	5.90085	0.0067
LOG(PCI) does not Granger Cause LOG(GOVREV)		2.69620	0.0833
LOG(FDI) does not Granger Cause LOG(PCI)	36	6.19879	0.0054
LOG(PCI) does not Granger Cause LOG(FDI)		1.34118	0.2763
TOP does not Granger Cause LOG(PCI)	36	0.55064	0.5821
LOG(PCI) does not Granger Cause TOP		1.33999	0.2766
LOG(GOVEXP) does not Granger Cause FISCD	36	1.74081	0.1921
FISCD does not Granger Cause LOG(GOVEXP)		0.56859	0.5721
LOG(GOVREV) does not Granger Cause FISCD	36	3.85641	0.0319
FISCD does not Granger Cause LOG(GOVREV)		2.90996	0.0695
LOG(FDI) does not Granger Cause FISCD	36	0.26604	0.7681
FISCD does not Granger Cause LOG(FDI)		0.92113	0.4087
TOP does not Granger Cause FISCD	36	0.14089	0.8691
FISCD does not Granger Cause TOP		0.16319	0.8502
LOG(GOVREV) does not Granger Cause LOG(GOVEXP)	36	1.14401	0.3316
LOG(GOVEXP) does not Granger Cause LOG(GOVREV)		2.19524	0.1283
LOG(FDI) does not Granger Cause LOG(GOVEXP)	36	1.37272	0.2684
LOG(GOVEXP) does not Granger Cause LOG(FDI)		0.80505	0.4562
TOP does not Granger Cause LOG(GOVEXP)	36	0.26098	0.7720
LOG(GOVEXP) does not Granger Cause TOP		3.90850	0.0306
LOG(FDI) does not Granger Cause LOG(GOVREV)	36	2.39259	0.1081
LOG(GOVREV) does not Granger Cause LOG(FDI)		1.14771	0.3305
TOP does not Granger Cause LOG(GOVREV)	36	0.48201	0.6221
LOG(GOVREV) does not Granger Cause TOP		3.60028	0.0393
TOP does not Granger Cause LOG(FDI)	36	2.95024	0.0672
LOG(FDI) does not Granger Cause TOP		3.19650	0.0547

Source: Eviews 9 Regression Output

The Pair wise granger causality test result as presented above indicated that there is no significant causality relationship between (i) real gross domestic product (proxy for economic growth) and fiscal deficit in Nigeria and (ii) poverty reduction and fiscal deficit in Nigeria

5. Conclusion and Recommendation

Conclusion

This work empirically examined whether fiscal consolidation impacts significantly on economic growth and poverty reduction in Nigeria and specifically investigated the impact of fiscal deficit and non – fiscal control variables on economic growth and poverty reduction in Nigeria for the period 1981 to 2018. It also determined whether significant causal relationship exists between fiscal deficit and economic growth, and between fiscal deficit and poverty reduction in Nigeria over the period. Autoregressive distributed lag (ARDL) bounds test technique, Error Correction Model and Granger causality approaches were employed in analyzing the work.

From the results obtained, the conclusion is as follows: Fiscal deficit has positive relationship with and statistically significant impact on economic growth in Nigeria in the long run; trade openness and foreign direct investment have no significant impact on economic growth in the Nigeria over the period studied.

Total government expenditure has negative relationship with and insignificant impact on real gross domestic product both in the long run and short run. Government total revenue, on the other hand, showed positive relationship with but insignificant impact on real gross domestic product both in the long run and short run.

Government recurrent and capital expenditures impact significantly on economic growth in Nigeria in the long run. The result also showed that in the short run, capital expenditure of government significantly impacts economic growth while recurrent expenditure does not.

Direct tax related negatively with economic growth in the short and long run, and that its impact on growth is statistically significant in short run and insignificant in long run. On the other hand, the result further indicated that indirect tax impacts significantly on growth in the long run and that it positively relates with economic growth in Nigeria.

The current period fiscal deficit has no significant impact on poverty reduction. However, the fiscal deficit lag one was found to have statistically significant impact on poverty. Government expenditure, government revenue, foreign direct investment, and trade openness showed statistically significant impact on poverty reduction in Nigeria in the short run. The result further revealed that fiscal deficit (FISCD), government expenditure (LOG(GOVEXP)), government revenue (LOG(GOVREV)), foreign direct investment (LOG(FDI)), and trade openness (TOP) have statistically significant impact on poverty reduction in Nigeria in the long run. The previous year's information on poverty level significantly impacts poverty reduction in Nigeria. The coefficient of error correction mechanism (ECM) of the poverty model V is negative and statistically significant; indicating that approximately 26.5% of any movement into disequilibrium is corrected back to the long run equilibrium within a year.

The result of Granger causality test indicated that there is no significant causality relationship between (i) real gross domestic product (proxy for economic growth) and fiscal deficit in Nigeria

and (ii) per capita income (proxy for poverty) and fiscal deficit in Nigeria over the studied period.

Recommendations

Based on the findings, the work recommends that Government should reduce the size of its deficits through fiscal consolidation so as to attain the desired level of sustainable economic growth. The Federal Government should complement fiscal consolidation by comprehensive debt reduction strategies and structurally reform the economy to boost competitiveness.

The study also recommends that government should increase investment in social sector, manufacturing and basic infrastructure to increase productivity output in Nigeria. The business of the government has to be more transparent, accountable and capable. Again, strong political leadership is needed to ensure continuity of fiscal consolidation, strengthen expenditure management and treasury operations. This should be supported with robust and complete laws that promote and protect Public-Private Partnership (PPP) initiatives with an effective oversight functions that include the communities and citizens.

It is also recommended that government broadens her revenue base through reduction in tax expenditure, increase in contributions from other sources other than direct tax. Reduction of tax expenditures eliminates distortions in the economy.

The study further recommended that capital expenditures of government should be effectively implemented as stipulated in the budget. Funds generated by the government should be geared into productive sectors of the economy. It is also recommended that government should minimize recurrent spending. Finally, government should redistribute income through subsidizing government services and that future economic growth has to be pro-poor.

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