IAA Journal Arts and Humanities 6(1):35-47, 2020. ISSN: 2636-7297

Fiscal Adjustment for Growth and Poverty Reduction: Evidence from Nigeria.

[1]Emmanuel Oijagbe and [2]Attamah Nicholas

[1]Nigeria Security Printing and Minting Plc, 160,Samuel Ladoke Akintola Beulovard, Garki 2, Abuja.
[2]Dept. of Economics, Faculty of Social Sciences, Enugu State University of Science and Technology [ESUT] PMB 01660, Enugu Nigeria.

ABSTRACT

Fiscal reforms were introduced to enhance and foster fiscal adjustment. However, despite all these fiscal reforms, Nigeria continues to record fiscal imbalance with respect to poverty reduction and economic growth. The objective of this paper is to examine the effects of fiscal adjustment on economic growth and poverty reduction in Nigeria from the period 1981 to 2019. The data for this paper were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and the African Development Bank Database. Underpinned by the expansionary effect of fiscal consolidation, a prima for adjustment, the dynamic autoregressive distributed lag approach(ARDL) were utilized and the variables of poverty ratio, GDP growth rate as dependent variables, debt-to-GDP ratio (%), private investment (% of GDP), public investment (% of GD), population growth rate (%), inflation rate (%) and fiscal balance to-GDP were regressed. The results show that fiscal adjustment explanatory variables of debt-to-GDP ratio and fiscal balance to GDP have positive effects on GDP (economic growth) while it has negative effects on poverty reduction. The policy implications of these findings on economic policy were discussed. The paper therefore, recommended among others; the need for government and policy makers to sustain and strengthen the fiscal reforms in order to promote economic growth and then deepen the reforms for pro-poor and poverty reduction in the medium to the long-run.
Keywords: Fiscal adjustment, economic growth, poverty reduce, ARDL, Nigeria.

INTRODUCTION

Three prima facia definitions have emerged on this phenomenon: (i) a reduction of at least 3 percentage points in the ratio of gross public debt to GDP by the second year after the end of the two year fiscal tightening. (ii) the same as (i) except that GDP is replaced by potential GDP, and (iii) a reduction of at least 5 percentage points in the debt ratio by the third year after the end of the two-year fiscal tightening [1,2,3,4,5]. Fiscal adjustment, hence forth referred to fiscal consolidation reflects the increased emphasis on situations that warrant fiscal expansion. The term fiscal adjustment originates from the International Monetary Fund (IMF's) 1995 pamphlet-Guidelines for Fiscal Adjustment [6,7,8]. Fiscal adjustment may be necessary to achieve longer-term goals, such as growth promotion and poverty reduction, while heading-off vulnerabilities[9,10,11].Fiscal adjustment can also mobilize domestic savings, increase the efficiency of resources allocation and help meet development goals and aspirations [12,13,14]. In Nigeria, government have introduced various economic reforms in order to manipulate the desired changes in poverty rate or economic growth and to direct public sector revenue generation or management [15]. For example, austerity measure were introduced in the early 1980's, structural adjustment programme in 1986), privitalization and commercialization of government parastatals, passage of debt management act in 2007, passage of the fiscal responsibility act 2007 and public procurement act 2007 [16]. All these reforms were introduced to enhance fiscal adjustment. Despite all those reforms, Nigeria continues to record fiscal imbalances, with respect to poverty reduction and economic growth. As public debt rises, poverty rate also rises and economic growth declines [17]. As public debt rises, economic growth declines while Federal Government debt servicing expensesincrease to all high

45.2% of its revenue, as of September 2019, an aberration in countries with extremely high debt-to-GDP ratio [18,19,20,21,22]. The proportion of Nigerians living in poverty increases every year in relation to government fiscal measures to grow the economy.From theseexpositions, some salient research questions emerge:How does fiscal adjustment affect poverty reduction and economic growth in Nigeria? What is the trend evidence to show the relation between poverty, economic growth and fiscal adjustment correlates? What does empirical investigation show about the relationship between fiscal adjustment and poverty reduction and economic growth in Nigeria? What are the policy options for positively improving the relationship between fiscal adjustment and poverty reduction and economic growth in Nigeria? The main aim of the paper is to examine the effect of fiscal adjustment on poverty reduction and economic growth in Nigeria. Specifically, the objective of the paper among others is to investigate the effects of debt-to-GDP ratio (%) and fiscal balance-to-GDP ratio (%) (both measures of fiscal adjustment on) poverty reduction and economic growth. In order to achieve the aim and objective(s) of the paper, section 2 reviews the key literature. Section 3 examine and identify the appropriate methodological approach for the paper through careful consideration of the research literature, while section 4 presents and discusses the results and key findings. Finally, section 5 concludes the paper in line with the initial aim and objectives and discusses the contributions that the research has made to: theory, method and policy purposes. The conclusion also highlights the limitations that surfaced during the research.

The Model and Data

The Model and estimation Technique

Based on the above literature review and following the frameworks posited by Jeong (undated), McDermott &Wescott (1996) and Agnello& Sousa (2012).

(Equation 1) $= git = \sum_{i}^{2} = 1 \propto jgi, t - i + s2 = o\beta sABFCit - s + \gamma i + \mu t + Vit$

Where git is the percentage change in real GDP, $ABFC_iT$ is equal to the estimated size of the action-based fiscal consideration as a percentage of GDPin periods of fiscal adjustment, and zero otherwise, Yi is a vector of country-fixed effects to capture differences among countries normal growth rates, u_t is a vector of year-fixed effects to take account of global stock such as shifts in oil prices or the global business cycle, and Vit is a mean-zero error term. Subscript j indexes countries and subscript t indexes years.

The modified relationships that we want to estimate can be written as:

(Equation 2) $=GDPGR = f(FBGDP, PBINV, PRINV, LABOF, INFLR, DBGDP)$

Equation 2 *can be stated in more explicit form s follows*:

$GDPR = f(\beta_0 + \beta_1 FBGDP + \beta_0 PBINV + \beta_3 PRINV + \beta_4 LABoF + \beta_5 INFLR + DBGDP + \mu_1$

Where GDPGR=GDP growth rate; FBGBP = Fiscal balance-to-GDP ratio; PBINV = Public sector investment (% of GDP); PRINN = Private sector investment (% of GDP); LABoF=proxy for population growth rate (annual %), INFLR = inflation rate and DBGDP = Debt-to-GDP ratio (%).

(Equation 3) $= POVTR = f(FBGDP, DBGDP, PBINV, PoPGR, INFLR)$

Equation 3 *can be stated in more explicit form s follows*:

$POVTR = f(\propto_0 + \propto_1 FBGDP + \propto_2 DBGDP + \propto_3 PBINV + \propto_4 PoPGR + \propto_5 INFLR + \mu_2$

The variables are previously defined and
PoPGR = LABof in equation 2.

Table 1: Variables included and expected theoretical coefficient

Dependent	Independent variables	Expected relationship based on the theories
	Fiscal balance-to-GDP (FBGDP)	+
GDP Growth Rate (GDPGR)	Public sector investment (PBINV)	+
	Private sector Investment (PBINV)	+
	Population growth rate (LABOF)	+/-
	Inflation rate (INFLR)	-
	Debt-to-GDP ratio (DBGDP)	+/-

Table 2: Variable included and expected theoretical outcomes

Dependent	Independent variables	Expected relationship based on the theories
	Fiscal balance-to-GDP (FBGDP)	+
Poverty Rate (POVTR)	Debt-to-GDP ratio (DBGDP)	+/-
	Public sector investment (PBINV)	+
	Private sector Investment (PBINV)	+
	Population growth rate (LABOF)	+/-
	Inflation rate (INFLR)	-

Estimation Techniques

Unit Root Test

Economic variables are generally known with their random walk nature, which can be mitigated when converting into its first difference. Datta and Kumar (2011) note that regressing a non-stationary series on another would generate spurious result. In an attempt to guide against spurious results, Augmented Dickey-Fuller (ADF)) technique developed by [12] was employed. This test becomes necessary as it guides the research on the selection of appropriate estimation technique required for the analysis. The trend and intercept of the unit root are represented in equations (4) and (5), respectively

Equation 4 $= \Delta\gamma_t = \beta_0 + \Delta\gamma_{t-1} + \beta_1 + \Delta\gamma_{t-1} + \mu_t \; for \; intercept$

Equation 5$= \Delta\gamma_t = \beta_0 + \Delta\gamma_{t-1} + \beta it + \beta i\Delta\gamma_{t-1} + \mu_{t1} \; for \; trend$

Where γ_t the tested variable for unit root is, Δ is he first difference, μit denotes error term at period I, Y_{t-1} represents the one period of lag of the tested variables for unit root.

Autoregressive Distributed Lag(ARDL)

ARDL is a dynamic stochastic process and procedure. The lag periods defined the autoregression. Following the unit root test, the paper proceeds to examine short and long-run relationship among the variables. This is done using the autoregressive distributed lag, known variously as the bound test approach to co-integration. ARDL model was developed by Pesaran, Shin and Smith (1996) and ;later popularised by Pesaran, Shin and Smith (2001)is more advantageous to other co-integration procedure as it can be used when the variables under consideration are integrated of order zero I(0) and order I(1) is found. With this, bound test eliminates the variability in the order of integration against co-integration approach. Also, it produces better result because the error correlation mechanism can be obtained via simple linear transformation, which integrates short-run adjustments with long-run equilibrium without losing any information in the long-run. Also, for a

sample size of 37 observation (1981-2019).

Two sets of adjusted critical value put forward by Pesaran, Shin and Smith (2001) are the lower and the upper bounds. The former assumes that all variables are I(O), while the latter indicates that they are all I(1). The decision is that the null hypothesis of no co-integration is rejected if the F-Statistics falls above the critical upper bound test, while the null hypothesis cannot be rejected if it falls below the lower bound. Finally, the result would be rejected as inconclusive if it falls between the lower and upper bound. In line with [2], the unrestricted error correlation mechanism for testing the co-integration among the variables used in the paper is stated thus (see Appendix1).

The ARDL long-run mode is estimated if co-integration is found while the shot-run model is estimated if otherwise (see Appendix 2). The $\beta 0$-$\beta 7$ are the short run elasticities,$\propto 0$-$\propto 6$ arelong-run elasticities, ECM_{t-1} is one lag of error correlation term, $\Delta$is first difference, μ_{t-2} is the white noise, β_0 is the constant terms.

Stability/Diagnostic Test

In line with the assumptions of the Ordinary Least Square (OLS), the workhouse of econometric analysis, the reliability (diagnostic) and stability tests (the LM) test,the normality test (Breusch-Pagan) the linearity (Ramsey-Rest) test. For the stability tests, the cumulative sum (CUSUM) and the cumulative sum square (CUSUM 8q).

The Data

The data used for the study is presented in Table 3

Table 3: Description and Sources of Variables

Variables	Description and measurement	Source(s)
Debt-to-GDP ratio	Proxy for fiscal adjustment. Measured in ratio.(Explanatory variables)	African Development Bank Database, 2020 (AfDB)
Private investment	Control variable. Measured in % of GDP	Central Bank of Nigeria statistical bulletin, 2019
Public investment	Control variable. Measured in % of GDP	Central Bank of Nigeria statistical bulletin, 2019
Population Growth	Control variables. Measured by Labour Force Annual rowth	African Developent Bank Database, 2020
GDP Growth Rate	One of the dependent variable for economic growth rate in percent.	AfDB (2020)
Inflation rate	Control variable. Measured on Year-on-year rate (YOY).	CBN Statistical Bulletin, (2020)
Fiscal balance to GDP	Proxy for fiscal adjustment. Measured in percentage rate.	AfDB (2020)
Poverty rate	Other dependent variables. Measured in percentage rate.	AfDB (2020), CBN Statistical Bulletin, 2020.

Results and Discussion

Results

This section begins with the descriptive statistics of the variables (Dependent and Independent). This is followed by analysing the trends of GDP Growth Rate (annual %), debt-to-GDP ratio (%) and fiscalbalance-to-GDP ratio (%), and poverty rate (%of population). Table 4 reports the descriptive value of fiscal adjustment poverty economicvariables employed. The table shows that the mean value of poverty rate, fiscal balance-to-GDP, debt to-GDP, private sector investment, public sector investment, population growth, and inflation rate is 10.28, 2.68, 3.46, 16.44, -1.22. The series that measures the level

of discrepancy as shown in the standard deviation result is population growth, while public sector investment shows the lowest level. Skewness indicates the rate of asymmetry or discrepancy of the variables. Accordingly, INFLR, DOPGR, FBINN, DBGDP, and FBGDP have long off tail. This is because thevariables exhibit negative values, while poverty rate and private sector investment have long right tail. Kurtosis measures the pawedness and flatness of the series. The result shows that only DBGP is leptokurtic relative to its normal distribution because its value is greater than 3, while other variables have their kurtosis value lesser than3, this shows that the peak of their distribution are less than normal (Platy Kurtis).Jarque-Bera statistical test indicates the variables that are normally distributed as its measures the differences in the skewness and Kurtosis. The result shows that Jarque-Berastatistic rejects the null hypothesis of no normal distribution for all the variables. Thus, it is concluded that they are all normally distributed.

Table 4: Descriptive Statistics

Statistic	GDPGR	POVTR	FBGDP	DBGDP	PBINV	PoPGR	INFLR
Mean	10.28	2.68	3.46	16.44	-1.22	6.24	-3.5
Median	10.07	2.48	2.72	4.46	-1.13	6.43	6.11
Maximum	11.82	4.62	3.21	5.74	-0.68	10.13	8.54
Minimum	9.72	1.28	2.00	-0.64	-2.24	2.16	1.56
Std. Dev	0.56	0.69	0.31	2.07	0.40	2.62	2.43
Skewness	0.29	0.73	-0.87	-0.86	-0.66	-0.08	-0.31
Kurtosis	1.85	2.60	3.67	2.24	2.74	1.59	1.68
Jarque-Bera	3.78	3.73	5.71	5.77	2.97	3.29	3.44
Probability	0.13	0.24	0.01	0.06	0.32	0.15	0.18
Sum	401.04	184.63	107.48	134.28	-46.52	250.00	211.78
Sum-Sq-dev	11.94	18.32	3.66	163.28	6.42	250.07	224.03
Observation	38	38	38	38	38	38	38

Source: Researchers Computation using E-View 10:0
Note: E-View (econometric view 10.0)

Table 5: Unit Root of Philip Perrro (PP) and Augmented Dickey Fuller ADF

Variables	Critical values (%)	PP t-statistic/ADF t-Statistic				Prob.	Order of Interaction
		Level	Difference	Level	Difference		
GDPGR	-2.94	-2.14	-14.15	-1.95	-7.93	0.072	I(1)
POVTR	-2.94	0.91	-6.19	-1.90	-6.32	0.33	I(1)
FBGDP	-2.94	6.57	-4.00	3.17	-5.07	1.000	I(0)
DBGDP	-2.94	1.39	-3.36	-0.34	-3.586	0.97	I(1)
PBINV	-2.94	-1.27	-7.66	2.46	-7.59	0.4262	I(1)
POPGR	-2.94	0.66	-4.45	-4.94	-3.36	0.1513	I(0)
PRIINV	-2.94	-043	-10.54	1.945	-10.12	0.0716	I(1)
INFLR	-2.94	-1.80	-9.92	-2.91	-2.84	0.0713	I(1)

Source: Researchers Computation using E-view 10:0

Table 5 reveals that the result of the unit root test variables are mixed with levels and first difference. Example, the variables FBGDP and POPGR are stationary at its levels, i.e. I(0), while the rest of the variables are integrate at its first difference. The results therefore provide the basis for the paper to adopt the autoregressive distributed lag for both short-and long-run estimation of the model.Table 6 shows the lag selection criterion suggested by LR, FPE, AIC, S, HQ. The results show that the optimum number of lag for the paper is 1. The suggestion is taken into account when analysing ARDL.

Table 6: Lag Length Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-90.12	NA	5.20	5.40	5.61	5.40
1	150.85	270.55*	1.08	-5.17*	-2.78	-4.21
2	226.83	87.25	3.74	-6.25	-2.51	-5.06
3	318.54	72.03	8.46*	-7.28	-2.36	-6.43*

Source: Researchers Computation using E-vie 10.0 Note:* Indicates the selected lag order by criterion, Likelihood ratio test (LR), Final Prediction Error Criteria (FPE), Akaike Information Criteria (AIC), Schwarz Information Criteria (SC) and Hanna-Quinn Information Criteria HQ.

Table 7: ARDL Bound Test Result (GDPGR)

Model	F-Statistic	No of repressors (K)
F(FBGDP, DBGDP, PBINN, PRINN, LABOF, INFLR)	7.017691	6
	Bounds Test Result	
Significance	1(0) Bound	1(1)Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Source: Researchers Computation using E-10.0.

The bounds test result for GDPGR in table 7 shows that the F-statistic (7.017) approximately is beyond all the significance level. It therefore, indicates that there is a long-run Relationship between the dependent variables GDPGR and the independent/ explanatory/control variables.

Table 7b: ARDL Bound Result (POVTR)

Model	F-statistics	6
F(FBGDP, PBINV,PRINO, POPGR, INFLR	15.52788	6
	Bounds Test Result	
Significance	T90) Bound	I(1) Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

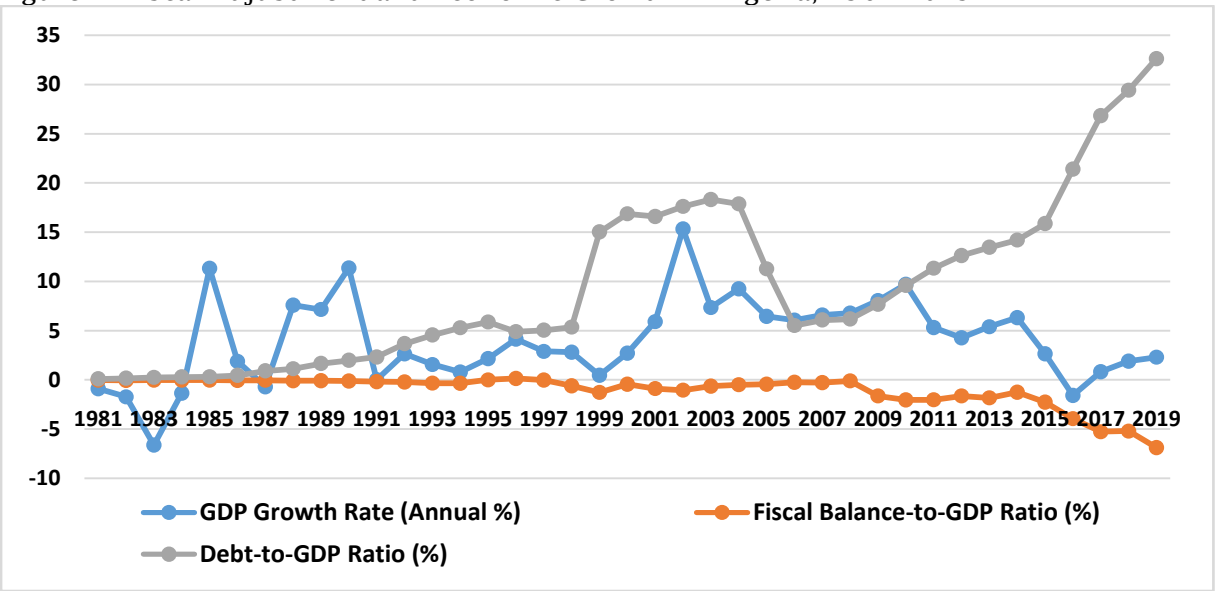
Source: Researchers Computation using E-View 10.0

The bounds test result in table 7b for Poverty (POVIR) shows that the F-statistics (15.53) approximately is beyond all the significance levels. The panel B results also indicate that there is a long-run relationship between poverty and the associated variables.

Trend Analysis

Figure 1 and 2 shows the trends of fiscal adjustment and economic growth and between fiscal adjustment and poverty rate. In Nigeria between the period 1981 to 2019 (the review periods). Three key relationships emerged from the analysis of data on the trend of GDP growth rate (annual %), fiscal balance-to-GDP ratio (%) and debt-to-GDP ratio (%). First, changes in GDP growth rate (annual%) and fiscal balance-to-GDP ratio (%) move in the same direction, suggesting that as fiscal balance-to-GDP ratio is maintained, GDP growth rate (%) accelerates. Second, debt-to-GDP ratio and GDP growth rate (annual %) move in opposite directions, implying that as growth improves, debt to GDP reduces; and third, fiscal balance-to-GDP ratio (%) and debt-to-GDP ratio (%) is not correlated suggesting there should be no trade-off between fiscal balance-to-GDP ratio (%) and debt-to-GDP ratio (%)

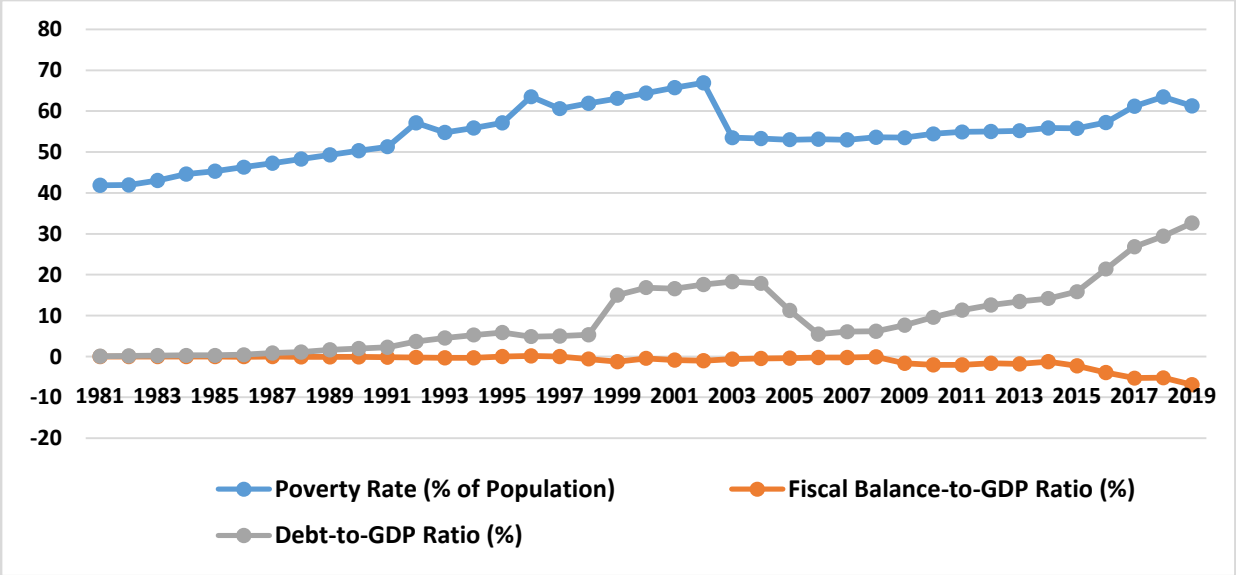
Figure 1: Fiscal Adjustment and Economic Growth in Nigeria, 1961-2019.



Source: AfDB(2020)

From figure 2, we can see that debt-to-GDP ratio (%) and fiscal balance-to-GDP ratio (%) moves in the same direction, suggesting that both deteriorate economic growth, while poverty rate moves in opposite direction with both fiscal balance-to-GDPratio (%) and debt-to-GDP ratio (%) implying that as debt-to-GDP and fiscal balance-to-GDP improves, economic growth improves in other way.

Figure 2: Fiscal Adjustment and Poverty Rate in Nigeria 1961-2019.



Source: AfDB(2020)

Table 8: ARDL Long-Run (a) and short-run relationships (b) for GDPGR

Variable	Coefficient	t-statistics	Prob.
Long-Run Relationship			
C	588.3003	2.796207	0.0105
GDPGR*	-1.461110	-5.417346	0.000
DBGDP	0.217592	0.867017	0.3953
FBGDP*	1.657569	1.613122	0.1210
PBINV	0.177933	1.175733	0.2523
LABOF**	-18.70090	-2.769715	0.0112
PRINV**	-0.629977	-1.909310	0.0693
INFLR**	-0.058495	-1.471229	0.1554
Short-run Relationship (ECM)			
C	588.3003	7.910337	0.0000
D(GDPGR)	0.422530	3.129828	0.0049
D(DBGDP)	0.521085	2.278039	0.0328
D(PBINV)	-0.152265	-1.110407	0.2788
CointEq(-1)*	-1.46110	-7.907038	0.0000
R-square =	0.725115	Prob F-statistics)	0.00002
Adjusted R-squared	0.656394	Mean dependent var	0.247992
S.E of Regression	2.738635	S.D. dependent var	4.672010
		DW	=2.47

Source: Researchers Computation using E-View 10.0
* P-value incompatible with t-Bounds distribution.
** Variables interpreted as Z-Z(-1)+D(Z)

Table 8b explains the short-run relationship that shows whether fiscal adjustments have effect on economic growth in Nigeria. First, the significance of error correction mechanism (ECM) result and the negative sign of the coefficient lend credence to the establishment of co-integration among the variables influencing GDPGR. However, the result of the ECM with (-1). Needs to be interpreted with much caution as the conventional is (-0.). This coefficient indicates -1.46 and suggests that about 15% of previous year disequilibrium is correlated in the current year. Hence, the Parsimonious ECM adjusts rapidly to change in the long run.

From the short-run results, the coefficient of determination is 0.72, meaning that that explanatory variables account for about 72 percentage point of the variations in GDPGR. This implies that the null hypothesis of no effect is rejected, while the hypothesis that fiscal adjustment has effect on GDPGR is accepted. The R-Bar squared at 0.65 implies that the fiscal adjustment and economic growth equation has good predictive ability while the standard of error of regression line implies that the overall goodness-of-fit at 2.74 implies that the equation has reliability prediction power.

In terms of the signs and magnitude of the coefficients, the long-run results indicates that debt-to-GDP ratio, fiscal balance-to-GDP growth rate. In line with the theoretical postulation, such that a unit increase in DBGDP will lead to 0.2 or 2 percent increase in GDPGR, 1.6% increase in GDPGR and 0.17 percent increase respectively. Similarity the population growth rate, private investment and inflation negatively influences GDP growth. That of inflation is expected. This implies that a unit increase in the labour force rate, private sector investment and inflation rate will lead to 18%, 6% and 1% decrease in GDPGR respectively.

Table 9: ARDL Long-Run (a) and short-run relationship (b) for POVTR

Variable	Coefficient	t-statistics	Prob.
Long-Run Relationship			
C	90.16724	2.075763	0.0622
POVTR*	-0.769531	-5.021133	0.0004
FBGDP	-5.652301	-5.229311	0.0003
DBGDP	-1.294356	-4.721725	0.0006
PBINV	0.483897	4.306580	0.0012
PRINV	2.442067	5.786556	0.0001
INFLR	0.088072	1.494561	0.1632
PoPGR	-24.99430	-1.664341	0.1242
Short-run Relationship (ECM)			
C	90.16724	13.02180	0.0000
D(POVTR)	0.288279	3.568449	0.0044
D(FBGDP)	-1.708147	-4.150938	0.0016
D(FBGDP)(-1)	1.417083	2.624292	0.0236
D(DBGDP)	-0.371355	-3.068902	0.0107
D(DBGDP)(-1)	0.443599	3.209668	0.0083
D(PBINV)	0.101111	1.602437	0.1374
D(PRINV)	0.013710	0.132393	0.8971
D(PRINV)(-1)	-1.251854	-6.970689	0.0000
D(PoPGR)	390.1540	6.832620	0.0000
D(PoPGR)(-1)	-365.1066	-5.348694	0.0002
D(INFLR)	-0.112072	-7.806093	0.0000
D(INFLR)(-1)	-0.036396	-2.719224	0.0200
CointEq(-1)*	-0.769531	-12.96084	0.0000
R-square =	0.951520	Mean dependent	0.504400
Adjusted R-squared	0.900189	var	2.969323
S.E of Regression	0.938094	S.D. dependent var	3.094253
F-statistics	18.53684	DwrbinWakon	
Prob. (F-statistics)	0.000000		

Source: Researchers computation using E-view 10.0

Note: P-value incompatible with t-bounds distribution

Table 9 explains the short-run relationship showing the relationship between fiscal adjustment and poverty. The result show that the coefficient of ECM had the appropriate negative relationship, thereby further explains the co-integration among the variable of fiscal adjustment influencing poverty. The coefficient f 0.769, suggesting that about 76 percent of previous year disequilibrium is corrected in the current year. From the short-run relationship results, the coefficient of determination is 0.95, meaning that the explanatory variable account for 95% change/variation in the independent variable (poverty). The adjusted R-square has a value of 0.900 percent; implying that the explanatory variable account for 9 percent predictive poverty. The overall goodness of fit as shown by the S.E.E, at 0.93 or 93% is good enough to explain the reliability of the models prediction power. The table also show the signs and magnitude of the coefficient, the long-run indicates a negative relationship between the fiscal adjustment variables (FBGDP, DBGDP) and poverty. This implies that fiscal adjustment affects poverty reduction, such that 1 percentage increment in fiscal adjustment would lead to 5.65 and 1.29 percent respectively. The results are negations of the heretical postulations. PBINV, PRINV and INFLR are positive related to poverty reduction. The poverty relationship between inflation an poverty may be as a result of the macroeconomic reform. The coefficient of PoPGR is negatively related to poverty such that a percentage increment in the labour force increases poverty by 2%.

Table 10a: ARDL Diagnosis Estimation (POVTR)

Statistics	Values	
	Normality test	
Tarque-Bera	0.639655	0.726274
	Serial correlation LM test	
Obs* R-Squared	0.639655	0.726274
	Heteroskedastricity test	
Obs* R-squared	2.348710	0.4829
	Ramsey RESET test	
t-statistics	0.569830	0.5814
f-statistic	0.3247.6	0.5814

Source: Researchers Computation using E-View 10.0

Table 10b: ARDL Diagnostic Estimation (GDPGR)

Statistics	Values	
	Normality test	
Tarque-Bera	5.956011	0.050894
	Serial correlation LM test	
Obs* R-Squared	6.988537	0.0304
	Heteroskedastricity test	
Obs* R-squared	7.946996	0.8470
	Ramsey RESET test	
t-statistics	1.214661	0.2380
f-statistic	1.475401	0.2380

Source: Researchers Computationusing E-View 10.0

Table 10a and 10b presents the post-estimation tests to examine the suitability of the model using the normality test, serial correlation test, heteroskedasticity test and the Ramsey Reset test for both the fiscal adjustment poverty and the fiscal adjustment-economic growth models. From both table 10a and 10b, the estimates show that the variables are normally distributed, o problem of serial correlation and noproblem of heteroskedasticity, from the Ramsety Reset estimates, the models are well filled.The stability test using the cumulative test(CUSUM)andcumulative sum of square(CUSUM SQ) shows that the models (POVTR) and (GDPGR) are wellfitted, conforming the diagnostic tests. The test decision is that, if the plotted CUSUM and CUSUM Sq statistics lie within 5% significance level, the tests (not-shown here) shows that bot the CUSU and the CUSUM square test for both models (POVTR) and (GDPGR) falls within the 5% level of significance (indicated) by the two red lines) [14].

DISCUSSION OF FINDINGS

From table (8a)-the long-run results for fiscal adjustment GDPGR results, the estimates of fiscaladjustment (DBGDP & PBGDP) were positively and significantly relate to economic growth (GDPGR) within the reviewing period. Public sector investments were also positively related to growth. The positive relationship between investment and economic growth has been established in the empirical literature [5,7,9]. The negative relationship between private sector investment and population force is not surprising as the theoretical assumption. To say the east, private sector investment in Nigeria is crowded. Out by harsh business environment, delay in business registration, high cost of production inputs, high interest rate and unmanaged exchange characterised uncontrollable exchange windows. Lack of infrastructurealso stifles private domestic investment. This is a major concern and a reiterating result for government action of Nigerian business environment. The high unemployment rate among the Nigerian graduates could be the plausible explanation for the negative relationship between population growth and economic growth. The negative relationship between inflation rate and economic growth in Nigeria within the reviewing period is expected. From the results, the estimate of fiscal adjustment has positive effect on economic, a result that is in consonance with the earlier findings of [7] who also found a

negative relationship. [9] concludes that fiscal consolidations based on reducing public investment have the largest effect on output, while fiscal consolidation based on revenue mobilization are less harmful. These findings suggest that the negative impact on growth can be mitigated through the design of fiscal adjustment.

From Table 9-the long run results of the relationship between fiscal adjustments, these exist a negative relationship between FBGDP and DBGDP-variables of fiscal adjustment and poverty rate. This is together with population growth. Meanwhile,positive and significant relationship exists between private and public sector investments and poverty rate. The negative relationship between fiscal adjustment as represented by FBGDP and DBGDP and poverty reduction may follow the findings of Owuru and Farabiyi (2016), that reported that the level of government capital expenditures in Nigeria does not reduce the level of poverty in te Nigerian economy. As such, fiscal adjustment within the reviewing period may not have contributed positively to poverty reduction.

CONCLUSION

The paper has attempted to examine the relationship between fiscal adjustment and economic growth and poverty between the reviewing period, 1981 to 2019. The data sources include the African Development Bank Database and central Bank of Nigeria (CBN) Statistical Bulletin. Theoretically, the paper is anchored on the expansionary effect of fiscal consolidation via the demand and supply sides. The framework (models) is build adapting the empirical models of [13]. The dependent variables of the model are poverty (POVTR) and economic growth (GDPGR). The explanatory variables are fiscal adjustment (FBGDP) and (DBGDPP while the control variables are private sector investment, public sector investment population growth rate and inflationrate. The ARDL is the preferredanalytical approachbased on its merits. The pre-post and stability test were carried out to ensure that the model is free from any estimation error.The summary of the key findings and implications of the findings are summarized as follows:

- There exists positive effect of public investment on economic growth, while negative relationship existsbetween private investment and economic growth.
- Labour force participation is negatively related to economic growth.
- The estimates of fiscal adjustment have positive effect on economic growth.
- There exist negative relationship between fiscal adjustment and poverty reduction.
- Positive relationship between private and public sector investment on poverty reduction

From the above results and implications thereof, the following are recommended:

- The Nigerian Government/policy-maker need to sustain public sector investment and possibly enabling the Nigerian domestic business environment. The ongoing strategies on e-registration of business need to be pursued.
- The Government needs to seriously tackle unemployment in Nigeria and provide more policy incentives to job creation and job sustainability.
- The current interest rate administration via the CBN needs to revisited in a bid to promote domestic investment
- The fiscal reforms needs to be sustained and strengthened in order to promote economic and reduce in medium to the long-term.

The research was constrained by data collection by data collection and the reliability and measurement of these variables. There are variations to what fiscal adjustment is, however, fiscal consolidation was used to represent fiscal adjustment. The variables used FBGDP and DBGDPP are subject to criticism. As an agenda further research attempt; the research suggests extending the study topic to the ECOWAS/Sub-Saharan Africa.

This paper extends and contributes to the literature on the effects fiscal adjustment on economic growth and poverty in five ways: first, we show why

policymakers needs to put high and increased focus on fiscal adjustment and fiscal consolidation as it matters for economic growth and poverty reduction. Second, unlike previous studies, the focussed on economic growth and poverty reduction using the most comprehensive data set on debt-to-GDP ratio, and fiscal balance to GDP and economic growth and poverty. Third, the paper shows some interesting stylized facts on fiscal adjustment and economic growth and poverty in Nigeria. Four, the paper empirically determine the effect of fiscaladjustment on economic growth and poverty reduction in Nigeria. Five, we offer policy suggestions in light of the evidence that would help Nigerian government and policymakers, to effectively tackle the problem of low economic growth and persistentpoverty.

REFERENCES

1. Afonso, A. &Jalles, J.T. (2012). Measuring the Success of Fiscal Consolidation, *Applied Financial Economic 22 (13):1053-1061.*
2. Alesi, A &Ardaguna, S. (2010). Large changes in Fiscal policy: Taxes versus spending in J.R. Brown (ed), Tax policy and the Economy, Volume 24, National Bureau of Economic Research.
3. Alesina, A &Rugy, V. de (2013). Austerity: the relative effects of tax increases versus spending cuts, Mercatus Research.
4. Alesina, A. &Perotti, R. (1995). Fiscal expansions and adjustments in OECD countries, *Economic Policy 10:205-248.*
5. Alesina, A; Perotti, R. & Tavares, J. (198). The political economy of fiscal adjustments, the Brookings Paper n Economic Activity, Spring: 197-266
6. Arizala, F. Jesus, G. Charalambos, G. T & Mustafa, Y. (2020). The Impact of fiscal consolidations on growth in sub-Saharan Africa. *Empirical Economics.* http://doi.org/10.1007//500181-020.01863-x
7. Aynello, L. & Sousa, R.M. (2012). How Does Fiscal Consolidation Impact on Income Inequality? Banque De France Document De Travial No 382.
8. Beranke, B. (1983). Irreversibility, Uncertainty and Cyclical Investment, *Quarterly Journal of Economics, 98(1):85-106.*
9. BudgIT (2020). 2020 Budget: Analysis and Opportunities.
10. Data, K., & Kumar, C. (2011), Relationship between inflation and economic growth in Malaysia. *International Conference on Economic and Finance Research 42(2):415-431.* Retrieved from http://www.ipedr.com/vol4/82-F10100.pf.
11. Deyal, Z., Alvarez, L.G., &Waithe, K. (2019). Economic growth, Debt, and Fiscal Adjustment: barbados' tripartia Challenge. Inter-American Development Bank Policy Brief No IDB-PB-310.
12. Dickey, D.A. & Fuller, W.A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of American Statistical Association, 74(366): 427-431.* http://doi.org/10.2307/2286348.
13. Durbin, J., Brown, R., & Evans, J. (1975). Techniques for testing the constancy of regression relationships over time. Journal of the Royal statistical society: series B, 37(2): 149-192. Retrieved from http://pdsg.eg/00s.com/pds/200807/01/78/CUSUM_TEST.PDF.
14. Hagen, V., Hughes, J.A. &Strauch, R. (2002). Budgetary consolidation in Europe: quality, economic conditions and persistence, *Journal of the Japanese and International Economic 16 (4):512-532.*
15. Hagen, V., Hughes, J.A.H &Strauch, R. (2001). Budgetary consolidation in EMU-European Commission Economic Paper 148.
16. Kleis, M. &Moessinger, M-D. (2016). The long-run Effect of fiscal consolidation on economic growth: Evidence from Quatitative Case Studies, spintan Working Paper Series No. 6.
17. McDermott, J. &Wescott, R. (1996). An empirical analysis of

fiscal adjustment, *IMF Staff Papers 43:725-753.*
18. Oxfam (2019). The West Africa Inequality Crisis. Cowby oxford, OX42JY, UK.
19. Peasaran, H., Shin, Y., & Smith, R>J. (1996). Testing for the existence of a long-run relationship (Cambridge Working papers in Economics 9622, Faculty of Economics University of Cambridge. Available at https://ideas.repec.org/p/cam/camdae/9622.html.
20. Pesaran, H. M., Shin. Y., & Smith, R.J. (2001). Bounds testing approaches to the analysis of longrun relationships. Journal of Applied Econometric, 16, 289-326. https://doi.org/10.17863/CAM.5093.
21. UNDP (2010). Human Development Report: Nigeria (2008-2009). Achieving Growth with Equity. Abuja: Nigeria.
22. Wise, R. Pong-A-Pin, R. &Haan, J.de (2018). Can successful fiscal adjustment only be achieved by sending cuts? *European Journal of Policies Economy 3(4): 19-34*

APPENDIX 1

Error Correction mechanism of the Variables

$$\Delta \boldsymbol{GDPGR} = \boldsymbol{\beta_0} + \sum_{i=1}^{n} \boldsymbol{\beta_1}\, \Delta \boldsymbol{GDPGR_{t-1}} + \sum_{i=1}^{n} \boldsymbol{\beta_2}\, \Delta \boldsymbol{FBGDP_{t-1}} + \sum_{i=1}^{n} \boldsymbol{\beta_3}\, \Delta \boldsymbol{PBINV_{t-1}} + \sum_{i=1}^{n} \boldsymbol{\beta_4}\, \Delta \boldsymbol{PRINV_{t-1}} + \sum_{i=1}^{n} \boldsymbol{\beta_5}\, \Delta \boldsymbol{LABoF_{t-1}} + \sum_{i=1}^{n} \boldsymbol{\beta_6}\, \Delta \boldsymbol{INFLR_{t-1}} + \sum_{i=1}^{n} \boldsymbol{\beta_7}\, \Delta \boldsymbol{DBGDP_{t-1}} + \propto_1 \boldsymbol{GDPGR_{t-1}} + \propto_2 \boldsymbol{FBGDP_{t-1}} + \propto_3 \boldsymbol{PBINV_{t-1}} + \propto_4 \boldsymbol{PRINV_{t-1}} + \propto_5 \boldsymbol{LABoF_{t-1}} + \propto_6 \boldsymbol{INFLR_{t-1}} + \propto_7 \boldsymbol{DBGD}P_{t-1} + \mu_i$$

$$\Delta PoPTR = +\vartheta_0 + \sum_{t=1}^{n} \vartheta_1\, \Delta PoPVTR_{t-1} + \sum_{i=1}^{n} \vartheta_2\, FBGDP_{t-1} + \sum_{i=1}^{n} \vartheta_3\, DBGDP_{t-1} + \sum_{i=1}^{n} \vartheta_4\, PBINV_{t-1} + \sum_{i=1}^{n} \vartheta_5\, PoPGR_{t-1} + \sum_{i=1}^{n} \propto_6 INFLR + \beta_1 POVTR_{t-1} + \beta_2 FBGDP_{t-1} + \beta_3 DBGDP_{t-1} + \beta_4 PBINV_{t-1} + \beta_5\, PoPGR_{t-1} + \beta_6 INFLR_{t-1} + \mu_2$$

APPENDIX 2

ARDL Model

$$\Delta GDPGR = \beta_0 + \beta_1 GDPGR_{t-i} + \beta_2 FBGDP_{t-i} + \beta_3 PBINV_{t-i} + \beta_4 PRINV_{t-i} + \beta_5 LABoF_{t-i} + \beta_6 INFLR_{t-i} + \beta_7 DBGDP_{t-i} + \mu$$

$$\Delta GDPGR = \propto_0 + \sum_{i=1}^{n} \propto_1 \Delta GDPGR_{t-1} + \sum_{i=1}^{n} \propto_2 FBGDP_{t-1} + \sum_{i=1}^{n} \propto_3 PBINV_{t-1} + \sum_{i=1}^{n} \propto_4 PRINV_{t-1} + \sum_{i=1}^{n} \propto_5 LABoF_{t-1} + \sum_{i=1}^{n} \propto_6 INFLR_{t-1} + \sum_{i=1}^{n} \propto_7 DBGDP_{t-1} + \sum_{i=1}^{n} ECM_{t-i} + \mu_1$$

$$\Delta POVTR = \beta_0 + \beta_1 POVTR_{t-i} + \beta_2 FBGDP_{t-i} + \beta_3 DBGDP_{t-i} + \beta_4 PBIN_{t-i} + \beta_5\, PoPGR_{t-i} + \beta_6 INFL_{t-i} + \mu_2$$

$$\Delta POVTR = \propto_0 + \sum_{i=1}^{n} \propto_1 POVTR_{t-1} + \sum_{i=1}^{n} \propto_2 FBGDP_{t-1} + \sum_{i=1}^{n} \propto_3 DGDP_{t-1} + \sum_{i=1}^{n} \propto_4 PBIN_{t-1} + \sum_{i=1}^{n} \propto_5 PoPGR_{t-1} + \sum_{i=1}^{n} \propto_6 INFL + \sum_{i=1}^{n} ECM_{t-i} + \mu_2$$