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Effect of Fiscal Policy on Poverty in Nigeria

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ABSTRACT: The study investigated the effect of fiscal policy on poverty in Nigeria. The study covered 35-year period, spanning from 1986 to 2020 being a liberalized era in Nigerian economy. Fiscal policy being the explanatory variables, was disaggregated into federal government retained revenue (FRR), government capital expenditure (GCE), government recurrent expenditure (GRE),non-oil revenue (NOR), and public debt (PD). Poverty index as a dependent variable, being the unit measure for change in the poverty rate was used as proxy for poverty. Diagnostics test employed were, descriptive statistics to measure the mean, standard deviation, kurtosis and skewness as well as the Jarque-Bera statistics of the variables, while Augmented Dickey-Fuller unit root test was used to test for the stationarity of the data and Autoregressive distributive lag co-integration was employed to test for long-run relationship existing among the variables. Autoregressive distributive lag (ARDL) was used for the analysis since there was a long run relationship existing among the variables and Granger causality test was also employed to measure the directional relationship of the variables under study. The unit root test result showed that all the variables studied were stationary at first difference except NOR and FRR which were stationary at level, and co-integration result showed that fiscal policy has a significant long run relationship with poverty in Nigeria. The ARDL result showed that non-oil revenue showed initial negative government retained revenue but started effect of -3.298345 Lag 3, and then consistent positive effects 6.062662 Lag 4 through the short run periods. The federal government retained revenue showed initial negative effect of -3.739652 Lag 2followed by positive effect of 0.390469 Lag 3 and a return on positive effect of 6.249618 Lag 4 within the short run period. The government capital expenditure had similar trend as the federal retained revenue with a negative effect of -6.786381 in the initial period and first lag and then swung between positive and negative effects within the short run period, while the government recurrent expenditure started out with three year lagged period positive effects of 3.069591, 5.9766088, & 4.406814 but ended with negative effect of -7.978000. It was only the public debt profile that out rightly showed negative effect. Public debt has initial negative effect of -1.323569 and positive effect of 3.415523 Lag 3on the short run. Granger causality showed that non-oil revenue and public debt had causal effects on poverty reduction while federal government retained revenue, capital expenditure and recurrent expenditure do not have causal relationship with poverty reduction in Nigeria. The study concludes that fiscal policy with adjusted R^2 of 0.993059 (99%) and p. value of 0.006425 has a significant effect on poverty in Nigeria. It was recommended that revenue and expenditure be increased while public debt be minimized in order to reduce poverty in Nigeria.

KEYWORDS: Capital Expenditure, Poverty Index, Non-Oil Revenue and Expenditure.

I. INTRODUCTION

Fiscal policy is the means by which a government adjusts its level of spending to monitor and influence a nation's economy. It is used alongside with the monetary policy, which the central bank uses to influence money supply in a nation. These two policies are used to achieve macroeconomic goals in a nation. These goals include price stability, full employment, reduction of poverty levels, high and sustainable economic growth, favorable balance of payment, and reduction in a nation's debt. The intent of fiscal policy is essentially to stimulate economic and social development by pursuing a policy stance that ensures a sense of balance between taxation, expenditure and borrowing that is consistent with sustainable growth and gear towards poverty reduction (Agu, Okwo, Ugwunta, & Idike, 2015). The Nigerian economy is associated with a large populace of rural dwellers whose main occupation depend on agriculture and a small urban sector, which has profited most from the utilization of the nation's resources and the provision of services from successive governments. The presence of this economic division or the actual sector dualism has added to the continuation of high poverty levels in the nation. Poverty is a worldwide phenomenon, which impinges on global and various national economies in varying degrees. It affects persons in different depths, different phases and at various times. There is no country that is entirely free from poverty. Poverty trends vary from one nation to another (Odior, 2014). Some researchers view fiscal policy as the utilization of government expenditure, borrowing and taxation to impact the design of economic activities and growth including the level of total demand, productivity and employment.

Fiscal policy means government's organization of the economy via mobilization of its revenue and spending ability to attain certain required macroeconomic goals among which is the growth of the economy (Medee & Nenbee, 2011). Olawunmi & Tajudun (2007) stated that fiscal policy relates to the use of public outlay and taxation to impact on the level of economic activities. Also, according to Anyanwu (2012), the goal of fiscal policy is to elevate economic conditions beneficial to business expansion while making sure that any of such government actions are tailored to economic growth and poverty reduction. Fiscal policy is one of the most vital tools available to governments of poor countries in combating poverty (Obi, 2007 and Obadan, 2001). The concern of this research on fiscal policy, amongst other macroeconomic policies, derives mainly from the fact that it can play a part in poverty reduction as indirect interference apart from being one of the significant direct interferences targeting particular groups or pro-poor subdivisions, which are susceptible to natural or economic shocks (Damuri & Perdana, 2003). Sanusi (2018) postulates that the Nigerian economic challenges has constantly been resource mishandling and misplacement of priorities. Funds that ought to be spent on power, education, and setting up of new industries so as to create employment, are recklessly and mismanaged

Statement of the Problem

Scholars stated that there are two clear reasons currently why fiscal policy has been unsuccessful for eradicating poverty level in Nigeria. The first comprises factors related with policy itself (in aspect of poor timing, poor strategy mix, poor execution, etc.). The second obvious reason has to do with non-budget strategy factors (like institutional factors). These reasons are objective. Instead, they complement each other. One can then ask, what is role of fiscal policy in prompting growth, reallocating income and alleviating poverty in Nigeria? Also, can fiscal policy be planned so to guarantee growth and reduce the poverty while upholding macroeconomic stability? These are vital questions given the transformed interest of the democratic institution in Nigeria aimed at the mitigation of poverty and given that fiscal policy has a critical role to play in poverty reduction in Nigeria. Poverty mitigation and economic growth have variously studied by various scholars in Nigeria. Aigbokhan, (1985) and Ogwumike (2000);

But, none of these researches have tried to evaluate policy responses aimed at poverty reduction in Nigeria. Similarly, previous researches on Nigeria have relied on partial outlines. The effects of fiscal policy on different industrial sectors and various revenue groups are neither studied nor evaluated. Majority of these researches have engrossed themselves with recommending poor policy measures for containing poverty in Nigeria. A few of them have tried to study the influence of economic growth on inequality. However, it is obvious from the available literature that poverty, growth, and inequality can impact, and are in turn impacted by, fiscal policy. This is a vital area ignored by previous studies. Therefore, this research intends to encapsulate other parameters by trying to determine and assess the influence of these fiscal policy measures like Government spending, public-debt, Government revenue, as strategies towards poverty reduction in Nigeria. This research work is targeted at ascertaining the effects of Government fiscal policy on Poverty rate in Nigeria. Some specific objectives are to: determine the effect of federal retained revenue on poverty index in Nigeria. ascertain the effect of government recurrent expenditure on poverty index in Nigeria, examine the effect government capital expenditure on poverty index in Nigeria, determine the effect of non-oil revenue on the poverty index in Nigeria and ascertain the effect of public debt on poverty index in Nigeria. The hypotheses are formulated in line with the specific objectives of the study.

II. LITERATURE REVIEW

Conceptual Review

Concept of Fiscal Policy

Fiscal policy is the use of government spending and taxation to influence the economy. When the government decides on the goods and services it purchases, the transfer payments it distributes, or the taxes it collects, represents fiscal policy. The primary economic impact of any change in the government budget is felt by particular groups - a tax cut for families with children, for example, raises their disposable income. Fiscal policy, however, generally focuses on the effect of changes in the government budget on the overall economy. Although changes in taxes or public sector spending that are "revenue neutral" they may be construed as fiscal policy - and may affect the aggregate level of output by changing the incentives that firms or individuals face. The term "fiscal policy" is usually used to describe the effect on the aggregate economy of the overall levels of spending and taxation, and more particularly, the gap between them (Weil, 2019).

Fiscal policy is an important tool for managing the economy because of its ability to affect the total amount of output produced - that is, gross domestic product. The first impact of a fiscal expansion is to raise the demand for goods and services. This greater demand leads to increases in both output and prices. The degree to which higher demand increases output and prices depend, in turn, on the state of the business cycle. If the economy is in recession, with unused productive capacity and unemployed workers, then increases in demand will lead mostly to more output without changing the price level. In contrast if the economy is at full employment, a fiscal expansion will have more effect on prices and less impact on total output.

The Concept of Government Revenue

Government Revenue means influxes of financial cash or resources into public-sector from other economic

sectors/units (Jegedee 2014). That is, public revenues comprise of non-repayable receipts and revenue receipts and grants, and this is spilt into capital and current receipts: whilst current receipts consist of non-oil and oil receipts within specified period, capital receipts include receipts from non-monetary assets employed in production process for more than 1 year. In Nigeria, these proceeds have been used by FG and their operational equivalents to execute many tasks of government like administrative services, community and social services, transfer services, economic services, through sectoral allotment. Government revenue implies to every money obtained by government from internal and external sources like export, net refunds, taxes, and other rectifying transactions, intra-government transfers, incomes from issuance of debt, agency or private trust dealings, and investments sales (Ahmed, 2010). It means government's monetary resources that are money-related and are generated or assembled from outside or within economy (Obiechine, 2010).

However, as stated by Ihendinihu (2014) and Otuabala (2011), there exists two major forms of FG revenue present in Nigeria and they comprise non-oil and oil revenue. Oil proceeds comprise of government proceeds from deals that are oil-related and this could be from external or internal sources; whilst non-oil revenue comprises of proceeds from non-oil associated activities, which can be from external or internal sources respectively.

Concept of Poverty.

Concept of poverty doesn't incline to precise definition because of fact that its nature is multidimensional. Poverty is described by (World Bank: 2004) to be evident deprivation in welfare, and consist of several dimensions. It comprises low earnings and incapability to get basic services and goods needed for survival with self-esteem. It also includes low levels of education and health, poor access to potable water and sanitation, ineffective physical security, absence of voice, and inadequate capacity and chance to improve one's life (World Bank, 2004).

Poverty is deprivation of opportunities and choices, defilement of human self-respect. It denotes absence of basic capability to participate efficiently in society. It entails not having abundant to clothe and feed and a family; not having hospital or school to turn to; not having access to credit; not owning land on which to cultivate one's food or work to earn one's livelihood. It denotes insecurity, helplessness and omission of people, families and communities. It means vulnerability to violence, and it usually entailed living in fragile or marginal surroundings without access to potable water and sanitation (UNDP, 2009). Statistics reveal that poverty has been on rise in Nigeria since 1980.

Concept of Recurrent Expenditure

The recurrent expenditure consists of Government expenditure on cost of administration such as wages, salaries, interest on loans, Maintenances etc, whereas the capital expenditure are on projects like roads, airport, health, education, electricity generation, telecommunication, water etc. Public expenditure is therefore an important tool that brings about egalitarian society through the provision of welfare facilities (Ogba 1999). Public expenditure is functionally classified into four (4) categories in Nigeria: administration. economic services, social and community services, and transfers with capital and recurrent expenditure consumptions for each class (CBN 2011). This paper adopts CBN's definition of government expenditure as a working definition. Public expenditures are divided into capital and recurrent expenditures (Modebe, Regina, Onwumere, & Imo 2012).

Concept of Capital Expenditure.

Capital expenditures are those expenditures used in providing capital goods and services to the populace for example building of railway, dam, etc. According to (Isedu, 2002), one-way capital expenditure impacts on poverty is the creation of employment. The multi-hydra problem of unemployment in the economy is reduced to the barest minimum. Another way it causes economic growth is the re-allocation of resources to every sector of the economy. Resources are moved from the surplus areas to the deficit areas where they are needed with, thus opening up vast opportunities that will improve the citizens of the country.

Theoretical Review

The Income and Income Allocation Theory of Poverty

Conferring to Solomon (1980) evaluates Marx's economic concepts amongst which are theory of income and income allocation. As stated by this theory, beginning point of Marx's study was labor concept of value. Particularly, income allocation and theory of income and concentrates attention on labor-market and causes of labor's income centered on supply and demand factors, which likewise rely on levels of education, motivation, age and regional location amongst others.

Therefore, theory by Eyong forecasts positive connection between poverty and unemployment rate. The theory likewise forecasts that rise in employment without equivalent increase in productivity of services and goods can result in "disguised unemployment "and high rise in poverty, such condition will lead to inflation which will incline to profit debtors at detriment of creditors. Eyong thus, concluded elucidation of income allocation theory with its strategy proposal that: policy to eliminate poverty must be those that will decrease inflation rate and likewise deal with unemployment problem.

The Savers-Spenders Theory of Fiscal Policy

Savers-Spender's theory of fiscal policy was developed by Mankiw (2000) and used by Matsen, Sveen and Torvik (2008). This theory was developed because of the inconsistency observed by Barro-Ramsey (1974) in his theory of infinitely-lived families and Diamond-Samuelson (1965) in the theory of overlapping generation respectively. Savers-Spender's theory is the new theory developed to explain the

behaviour of fiscal policy in the economy. The first proposition is on temporary tax changes having large effects on the demand for goods and services. This proposition states that the higher take-home pay that spenders received will be offset by higher tax payments, or by lower tax refunds. The implication is that consumers should realize that their lifetime resources were unchanged and therefore, should save the extra take-home pay to meet the upward tax liability.

Theoretical Foundation

The theory backing this research is the Endogenous growth theory founded by Romer (1994). The theory opines that growth of the economy rely on investment in human capital, knowledge management and innovation (Romer, 1994). Government outlay on education development and research (RD), infrastructures, capacity building and power and is extremely crucial; it promotes growth of the economy and lessens poverty in country. It aids to access mutual pool of knowledge stemming from international technological spillovers. Technology is a non-rival concept and infectious because it is employed by one nation does not stop other nations from profiting from it. This type of government spending ensures alleviation of poverty in nation since there will be skilled and productive labor force and availability of novel technologies to rise output and technical expertise.

The Theory of Public Outlay

Wagner (1962) proposed this theory "Law of increasing scale of public outlay". The public sector plays major role in running of economy at every level of development. This part is typically through its spending and revenue policy. Theory of public spending development postulates that role of public spending progresses in course of advancement since budgetary function ought to acclimate to altering requirements of economy. The changing requirements of economy connects to both allocation and distribution viewpoints of public outlay. The allocation viewpoint deals with increasing share of public sector in economy.

Empirical Review

Mehmood & Sadiq (2010) used error correction model to study the correlation between government spending and poverty decrease in Pakistan from 1976-2010. The outcome of the study established the presence of negative correlation between government spending and level of poverty in Pakistan. Asghar (2012) similarly reviewed the influence of government expenses on poverty decrease in Pakistan employing yearly time-series data from 1972-2008. The research found proof that government expenses on education, to preserve order and law added significantly to lessen poverty while spending on budget deficit, economic services and community were discovered to be accountable for poverty in Pakistan. That is, they had undesirable impact to poverty decrease in Pakistan.

Omari and Muturi (2016) examined the influence of government sectoral outlay on level of poverty in Kenya employing time series data involving period from 1964-2010. The discoveries from regression results showed that spending on agriculture and health put forth significant positive influence on level of poverty. The influence of education expenses was not significant however; outlay on substructure had significant undesirable influence on level of poverty**.** Sasmal & Sasmal (2016) examined influence of public outlay on growth of economic and poverty mitigation in India employing both random and fixed effects models. Results revealed that public spending on infrastructures like road, power, communication, irrigation, and transport was high and per capita revenue and so influence on poverty diminution was positive and significant.

Fosu (2017) provided relative international evidence on improvement of economic growth via poverty reduction in emerging countries with stress on role of revenue inequality. The research found that high preliminary levels of inequity impede efficiency of growth in lessening poverty whilst growth inequality rises poverty directly at specified level of growth. Anderson & Okoro(2018).The use of regression statistical tool to examine connection between government outlay and poverty level of middle and low-income nations. The research generally determined that higher government expenses did not play any substantial role in poverty reduction of middle and low income nations under study.

Asadullah & Sevoia (2018) evaluated the international adoption of MDGs and state of capability employing cross-section and panel data of 89 emerging economies between 1990-2013. The research discovered that poverty decreased faster in nations that originally had higher earnings poverty. This findings show that the MDGs targets realization is contributory to poverty mitigation in developing nations. Maros & Will (2018), scrutinized the impact of output growth in agriculture, service and industry for international poverty decline. The research found that rises in agricultural output were more effectual in easing poverty in poor nations than upsurge in services and industry.

Sasana & Kusema (2018), made use of numerous fixed-effects model (FEM) to examine the influence of government spending on poverty reduction in Indonesia from 2008-2013. The research included 33 Provinces in Indonesia and the factors that affect poverty level were split into government outcome and economic factors. Generally, the research discovered that economic factors showed positive influence on poverty lessening in Indonesia whilst government outcome that comprises government expenses had significant negative influence on level of poverty.

Gaps in Literature

Many foreign and local studies have been reviewed in this study. However other related works on fiscal policy and poverty reduction had been studied internationally but empirical work in the Nigeria context are limited in scope irrespective of the challenges of poverty faced by Nigerians. However, this study provides an empirical evidence on the

effect of government spending in reducing poverty through concentration on the key sectors of the economy that facilitate the provision of critical infrastructures which will not only reduce poverty but also impact positively on the quality of human life, life expectancy and better living standard amid the Covid 19 ravaging the global economy.

III. METHODOLOGY

Research Design

This research work on the effect of Fiscal Policy on Poverty in Nigeria employed Ex-post Facto research design which shows that the data has been in existence and not originally collected by the researcher.

Sources of Data

This study used data from secondary sources, which are obtained from Nigerian Bureau of Statistics(NBS), Central Bank of Nigeria Statistical Bulletin(CBN Bulletin 2020)and World Bank economic data base, from 1986 to 2020. Poverty-Index was sourced from World-Bank database; Government expenses, government income and public were sourced from NBS and CBN Bulletin.

Model Specification

The model for the study would be stated as follows

$PIt = \beta_0 + \beta_1 GRt + \beta_2 GCEt + \beta_3 GREt + \beta_4 NOR, + \beta_5 PD + ut$…… (ii)

Converting equation (ii) to their logarithm form, we have:

$InPIt = In\beta 0 + In\beta 1 GRt + In\beta 2 GCEt + In\beta 3 GRE + \beta_4 NOR + \beta_5 PD + \mu t$…… (iii)

Where: "$\beta_0 + \beta_1 + \beta_2 + \beta_3 + \beta_4$and $\beta_5$are Constants; PI=Poverty index; FRR=Federal Retained Revenue; GCE= Government Capital Expenditure; GRE=Government Recurrent expenditure; NOR= Non-Oil Revenue, and PD=public debt, ut=Error Term;

A priori expectation: $\beta_0>0$, $\beta_1>0$, $\beta_2>0$, $\beta_3>0$, $\beta 4>0$ and $\beta_5>0$. The explanatory variables are expected to have positive (+) signs.

Methods of Data Analyses

The models were estimated using Auto-regressive Distributive Lag (ARDL) technique of data analysis, to determine the effect of Fiscal Policy on Poverty in Nigeria. The research hypotheses and questions formed the basis on which the result of the analysis were be presented.

Unit Root Test

The results of the ARDL estimation might be spurious if the variables were non-stationary. Unit root test of stationarity for each of the variables adopting the Augmented Dickey-Fuller (ADF), Philip Peron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) specification were used to ascertain the stationarity of the data. The suitable lag length for ADF estimation starts with maximum lag but that of PP and KPSS starts with few lags.

Co-integration Test

If all the variables are not found stationary at levels (i.e. they exhibit unit roots), we proceed further to carry out a co-integration test. The co-integration relationship between the variables will be ascertained by Auto-Regressive Distributed Lag (ARDL) bound as against the conventional technique of Johansen co-integration. The choice of the Auto-Regressive Distributed Lag (ARDL) approach against the traditional Johansen co-integration framework is that ARDL is structured in such a way that it takes into consideration the different order of integration of time series data.

Granger Causality Test

The granger causality technique gives an idea of the predicting power of a variable. When Fiscal Policy components help in the prediction of Poverty, Poverty is said to be Granger caused fiscal policy. Alternatively, Poverty is said to be Granger caused by fiscal policy when the coefficients on the lagged of fiscal policy instruments are statistically significant.

ARDL Error Correction Model

This can be used when the result of a co-integration test for a particular model reveals that more than one co-integrating vectors exist among the variables of interest. An Error Correction Model is designed for use with non-stationary series that are known to be co-integrated. The ECM has co-integration relations built into the specification so that it restricts the long-run behaviour of the endogenous variables to converge to their co-integrating relationships while allowing for short-run adjustment dynamics. The use of the methodology of Co-integration and ECM add more quality, flexibility and versatility to the econometric modeling of dynamic systems and the integration of short-run dynamics with the long-run equilibrium.

Regression Results Interpretation

The Adjusted R-Squared, F-Statistic and Durbin Watson test were the statistical criteria to interpret the result of the models that will be estimated. Furthermore, the coefficient of the respective variables also explained the nature of relationship between the dependent and the independent variables.

Adjusted R-Square (R^2):

The adjusted coefficient of determination indicates how well data points fit a statistical model – sometimes simply a line or curve. It is a statistic used in the context of statistical models whose main purpose is either the prediction of future outcomes or the testing of hypotheses, on the basis of other related information. It provides a measure of how well observed outcomes are replicated by the model, as the proportion of total variation of outcomes explained by the model. An R^2 of 1 indicates that the regression line perfectly fits the data.

F* Statistic:

F-statistic tests the hypothesis that all coefficients (except the intercept) are equal to zero. This statistic has F(k–1,n–k) distribution under the null hypothesis and normality assumption, and its *p-value* indicates probability that the hypothesis is indeed true. Conventionally, *p*-values smaller than 0.05 is an evidence of rejection of hypothesis of joint significance of explanatory variables.

Durbin Watson Statistic:

The Durbin-Watson test is the conventional tool to check for autocorrelation in the model. In a situation where is the Durbin-Watson detects the presence of autocorrelation in the model, the serial correlation LM test was utilized to correct the autocorrelation issue observed.

IV. RESULTS AND DISCUSSION

Data Presentation

The data used in this study are presented in table 4.1 below. The transformation of data in natural logarithm form is shown in table 4.2. The table4.1. Presents data on poverty index (PI),Federal Retained Revenue (FRR),Government Capital Expenditure (GCE), Government Revenue Expenditure (GRE) Non-oil Revenue (NOR) and Public Debt (PB). All the data are measured in Billions of Naira, except Poverty Index, which is measured in percentages.

Descriptive Statistics of Variables

The statistics employed for descriptive analysis are the mean and standard deviation. The trend analyses was also presented using the Line graph. The results for the mean and standard deviation were shown on Table 4.3 while trend analysis is the Figure 4.1.

Table 4.1: Descriptive Statistics of the Dependent Variables for the Study

	PI	NOR	FRR	GCE	GRE	PD
Mean	3.9677	5.8757	6.3491	5.1014	5.7977	9.0286
Median	4.0200	6.3400	6.6800	5.6000	6.3600	9.5000
Maximum	4.4300	9.0900	8.6100	6.9400	7.81000	11.530
Minimum	3.3000	1.5000	2.0800	1.8500	2.0400	5.3100
Std. Dev.	0.3100	2.1942	1.9447	1.3928	1.5732	2.0332
Skewness	-0.5642	-0.4927	-0.7536	-1.0090	-0.8544	-0.4649
Kurtosis	2.1667	2.0288	2.2869	2.9610	2.5332	1.8047
Jarque-Bera	2.8695	2.7914	4.0543	5.9411	4.5757	3.3445
Probability	0.2381	0.2477	0.1317	0.0513	0.1015	0.1878
Observations	35	35	35	35	35	35

The result on Table 4.1 is the disruptive statistics of the variables of the study. It comprised the mean, standard deviation, minimum, maximum, skewness and Kurtosis as well as the Jarque-Bera statistics. The mean is the average value of the variables while the standard deviation depicts the dispersion, which can be used to decipher normality of the distribution. However, the Jarque-bera explains the normality of each of the variables employed in the study.

From the results above, the mean for poverty index (PI) is 3.97 with a standard deviation of 0.3100; the NOR has mean of 5.88 and standard deviation of 2.19. Other variables are FRR, CE, RE and PD with mean of 6.351, 5.10, 5.80 and 9.03; and corresponding standard deviations of 1.94, 1.39, 1.57 and 2.03, respectively. The outcome showed the mean are larger than their respectively standard deviations. This suggests that the variables are well distributed.

On the other hand, Jarque-Bera statistics for the variables are: PI (JB = 2.8695, p 0.2381), NOR (JB = 2.7914, p. 0.2477), FRR (JB = 4.0543, p. 0.1317), CE (JB = 5.9411, p. 0.0513), RE (JB = 4.5757, p. 0.1015), and PD (JB = 3.3445, p. 0.1878). The null hypothesis for normality is that: there is normal distribution. The decision is the reject the Ho when the p. value is less than 0.05 level of significance. From the results, the p. values ($p > 0.05$) are greater than 0.05 and thus, the null hypotheses are not rejected. This explains that all the variables maintain normal distribution.

Unit Root Test Analysis

Table 4.2: Augmented Dickey Fuller unit root test

Variables	**At Level**		**1st Difference**		
	Statistics	**P-Value**	Statistics	**P-Value**	**Remarks**
PI	-1.780219	0.3836	-5.710419	0.0000	1(1)
NOR	-3.347064	0.0218	-	-	1(0)

FRR	-3.005862	0.0450	-	-	1(0)
GCE	-1.786280	0.3807	-6.852344	0.0000	1(1)
GRE	-2.549606	0.1132	-5.379053	0.0001	1(1)
PD	-1.663241	0.4400	-8.884701	0.0000	1(1)

*significant at 1%; **significant at 5%.

Source: *Authors computation from E views 9.0,*

The general assumption is that tie series data have unit roots. This implies that they are usually not stationary over time and this distorts time periods for which regression analysis can be performed for the data. The test of stationary was done to determine the stochastic behaviour of the variables for the study. The Augmented Dicker Fuller (ADF) test for unit root was employed. The outcome was used to determine the suitable tool of regression analysis for the study.

The results are shown on Table 4.2. The results are based on computed ADF t-statistics and the corresponding probability value (p.value). The decision rule is to reject the null hypothesis that: there is a unit root (not stationary) when the p.value is less than 0.05 level of significance; and to accept on the otherwise. When the null hypothesis is rejected, it can then be concluded that the variable is stationary and therefore reliable for performing time series analyses. From the results on Table 4.2, the variables for Non-Oil Revenue (NOR) and Federal Retained Revenue (FRR) are stationary at level [1(0)]. The variables for Poverty Index (PI), Capital Expenditure (CE), Recurrent Expenditure (RE) and Public Debt (PD) were not stationary at level but became stationary in their first differences {1(1)}. The model for the study therefore had variables for 1(0) and 1(1) stationary status. Thus, the ARDL is the most suitable tool of regression analysis for the study.

Determination of Lag Length

Table 4.3: Results of Lag Length Selection Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-123.8712	NA	0.000175	8.378790	8.656336	8.469263
1	-26.62958	150.5677	3.54e-06	4.427715	6.370536	5.061026
2	10.40072	43.00294	4.39e-06	4.361244	7.969340	5.537393
3	73.98336	49.22527	1.78e-06	2.581719	7.855091	4.300706
4	246.9368	66.94970*	3.21e-09*	-6.253984*	0.684663*	-3.992158*

The necessity to include vector autoregression of the dependent variable, demands to determination of the lag length of the regression model (Liew, 2004). Inclusion of the lagged values of the dependent variable as part of the independent variables will assist in determining the time period it takes for it the influence itself. As Liew (2004) posited, Akaike information criterion (AIC) and Final prediction error (FPI) are the most suitable for determining lag length when the sample is less than 60. The Akaike information criterion (AIC) was used to determine the lag length for analyses of co integration. The results shown on Table 4.5revealed that AIC is acceptable at 4th period. Thus, the Model has a lag order of 4 years.

Model Estimation

Analysis of the Long run relationship between fiscal policy on poverty.

Table 4.4: Result of the Bound test of long run relationship between fiscal policy and poverty in Nigeria.

Test Statistic	Value	K
F-statistic	25.21286	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79

2.5%	2.96	4.18
1%	3.41	4.68

Source: E-views 9 output

The ARDL bound test technique was used for the analysis of the long run relationship in the m model. The results are shown in Table 4.4. The result compared the F-statistics with the critical bound values. The F-statistics is 25.21286. The results showed that the F-statistic is greater than the lower and upper bounds of the critical values at 0.05 level of significance. This means that there is a co integration or long run relationship between fiscal policies and poverty reduction in Nigeria.

Nature of ARDL Long Run relationship and Speed of Correction to Equilibrium

The result of the bound test has established presence of long run relationship between fiscal policies and poverty reduction. The nature of the long run relationship is explained from results on Table 4.5.

Table 4.5: Model of the long run relationship between fiscal policies and poverty reduction in Nigeria

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)	-4.312817	0.592511	-7.278875	0.0184
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NOR	0.186160	0.025680	7.249105	0.0185
FRR	0.043637	0.031064	1.404756	0.2953
GCE	-0.092652	0.010113	-9.161983	0.0117
GRE	0.066996	0.023493	2.851749	0.1041
PD	-0.134614	0.032701	-4.116450	0.0543
C	4.006450	0.173236	23.127157	0.0019

The results showed that the error correction term [CointEq(-1)] is rightly signed with negative coefficient. The coefficient of the error term is -4.312817 and a probability value of 0.0184. Since the p.value is less than 0.05, the study rejects null hypothesis of no long run relationship. This indicate fiscal policies is capable of driving variations in poverty reduction trend back to normal trend over time. This implies that fiscal policies can be used to stabilise economy vis-à-vis poverty reduction in Nigeria.

The long run equation can be reported thus:

PI = 4.0064* + 0.1860NOR* + 0.0436FRR -0.0926CE* + 0.0669RE -0.1346PD*

The equation of long run relationship showed that NOR, FRR, and RE had long run positive effects on poverty index (PI) in Nigeria, wherein only NOR has p.value (0.0185) less than 0.05 indicating positive and significant long run effect on poverty index in Nigeria. on the other hand, Capital Expenditure (CE), and Public Debt depicted negative effects and both has p.values less than 0.05. Thus CE and PD has a long run significant negative effects on poverty index in Nigeria.

Estimation of Short Run Effect of Fiscal Policies and Poverty Reduction

In line with the estimation of the long run relationships, the short run effects are determined using the Error Correction Model.

Table 4.6: Error Correction Mechanism for Short run Dynamism of the relationship between fiscal policies and poverty reduction in Nigeria

Dependent Variable: PI

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
NOR	-0.710570	0.123125	-5.771142	0.0287

NOR(-1)	0.744454	0.088798	8.383701	0.0139
NOR(-2)	0.302534	0.049901	6.062662	0.0261
NOR(-4)	0.700317	0.103895	6.740641	0.0213
FRR	0.179145	0.036332	4.930734	0.0388
FRR(-1)	-0.493709	0.075144	-6.570166	0.0224
FRR(-4)	0.725896	0.116150	6.249618	0.0247
CE	-0.320028	0.050115	-6.385936	0.0237
CE(-1)	-0.234631	0.034574	-6.786381	0.0210
CE(-2)	0.512613	0.074652	6.866684	0.0206
CE(-4)	-0.380521	0.064040	-5.941883	0.0272
RE(-2)	0.587859	0.098369	5.976088	0.0269
RE(-3)	0.194426	0.044119	4.406814	0.0478
RE(-4)	-0.675417	0.084660	-7.978000	0.0154
PD(-3)	-0.631486	0.077731	-8.123962	0.0148
C	17.27909	1.942592	8.894860	0.0124

R-squared	0.999540	Mean dependent var	4.038387
Adjusted R-squared	0.993095	S.D. dependent var	0.251225
F-statistic	155.1012	Durbin-Watson stat	3.098836
Prob(F-statistic)	0.006425		

The result on Table 4.6 explains the short run dynamism in fiscal policy and poverty reduction nexus. The coefficient of determination and F-statistics explains the overall effect of the model while the coefficients of regression an the corresponding t-statistics is used to captured the effect of the individual variables at various short run periods, on poverty reduction in Nigeria.

The Cumulative Effect

The result of the coefficient of determination (R^2) is 0.9995 and the adjusted R^2 value is 0.9930. This indicates the model has 99% explanatory power. This implies that about 99% of the changes in poverty reduction in Nigeria can be explained by variations in fiscal policy variables (non-oil revenue, federal government retained revenue, capital expenditure, recurrent expenditure, and public debt). The F-statistic value of 155.10 with a probability value of 0.0065 which is less than 0.05 level of significance, is thus statistically significant. This indicates that fiscal policies have joint significant effect on poverty reduction in Nigeria.

Endogenous Effect

The coefficient of PI included as endogenous variable showed four lagged periods. The coefficients for lags 1, 3 and 4 are -3.0022, -1.0421, and -1.2459 which signifies that previous year PI has negative effects on present PI in the model. The coefficient on lag 2 is 1.9774 indicating positive effect. The t-statistics for the lagged periods -5.7336, 6.5871, -5.7182 and -6.2351 for lags 1, 2, 3 and 4 respectively. The p.values are less than 0.05 level of significance. This implies that PI is an endogenous variables in the short run model for fiscal policy and poverty reduction nexus.

Individual Short run Effects

Non-Oil Revenue (NOR): The coefficient of non-oil revenue showed negative relationships at initial period, and lag 3 with values of -0.7105 and -0.2338 respectively. The coefficients for lag 1 (0.7444) and lag 2 (0.3025) showed positive relationships between non-oil revenue and poverty reduction in Nigeria. However, p.value revealed that the initial period (NOR), lag 1 (NOR -1), lag 2 (NOR -2) and lag 4 (NOR -4) are less than 0.05 level of significance. This means that non-oil revenue has an oscillatory short run significant effects on poverty reduction in Nigeria with was negative at initial period and then positive in subsequent years.

Federal Retained Revenue (FRR): The coefficient showed that FRR is positive in the initial period (0.1791), lag 3 (0.0218) and lag 4 (0.7258); and negative in periods lag 1 (-0.4937), and lag 2 (-0.2450). The coefficients are statistically significant in the initial period, lag 1 and lag 4 respectively. This means that federal government retained revenue has mixed effects of positive in initial and lag 4 and negative effect in lag 1 period on poverty reduction in Nigeria.

Government Capital Expenditure (CE): The coefficient of capital expenditure showed that there a negative relationship between capital expenditure and poverty reduction in the initial period (-0.3200), lag 1 (-0.2346), and lag 4 (-0.3805), but positive relationships in lags 2 (0.5126) and lag 3 (0.0229). The t-statistic and corresponding p.values showed that significant negative effects in most of the periods (initial, lags 1, and 4). This indicates that capital expenditure has significant effects on poverty reduction in various periods ranging from negative effects in initial period, lag 1 and lag 4, and positive effect in the lag 2 period.

Government Recurrent Expenditure (RE): The coefficient of the recurrent expenditure was only statistically significant from the lag 2 to lag 4 periods. The results showed a significant positive effects in the lag 2 and 3 periods but significant negative effect in the lag 4 period. This implies that recurrent expenditure has significant effect on poverty reduction in Nigeria.

Public Debt (PD): The coefficient of public debt (PD) showed negative values in the initial period (-0.1009), at lag 1 (-0.0523) and lag 3 (-0.6315). The t-statistics and the corresponding p.values showed that only the lag 3 periods is statistically significant.

Causality Analyses

The study had established relationships between fiscal policies and poverty reduction in Nigeria. The study further investigated the causal effects among the variables to determine if the fiscal policy variables eventually trigger poverty reduction in Nigeria. The pairwise granger causality test was used to determine the structural pattern in the relationships between fiscal policies and poverty reduction. The results shown on Tables 4.7.

Table 4.7: Pairwise Granger Causality Test between fiscal policies and poverty reduction in Nigeria

Null Hypothesis:	Obs	F-Statistic	Prob.
NOR does not Granger Cause PI	33	3.24419	0.0540
PI does not Granger Cause NOR		1.91857	0.1656
FRR does not Granger Cause PI	33	2.35810	0.1131
PI does not Granger Cause FRR		1.08837	0.3506
CE does not Granger Cause PI	33	1.60804	0.2182
PI does not Granger Cause CE		0.71809	0.4964
RE does not Granger Cause PI	33	1.70320	0.2004
PI does not Granger Cause RE		1.68824	0.2031
PD does not Granger Cause PI	33	4.19868	0.0254
PI does not Granger Cause PD		1.86759	0.1732

The interpretation are based on F-statistics and p.value at 0.05 level of significance. The p.value less than 0.05 indicates rejection that "causality does not exist". From the results, the study showed that a unidirectional causality runs from non-oil revenue and public debts to poverty index. However, there is no causality in federal government retained revenue, capital and recurrent expenditures with poverty reduction in Nigeria.

Diagnostic Test of the Models

The diagnostics are tested to determine the reliability of the model estimations and empirical findings on this study. Following diagnostics including multicolinearity, serial correlation, and normality.

Multicolinearity Test

Multicolinearity brings about disturbance in the data that causes imprecise estimation where the confidence intervals of the coefficients tend to become very wide, the statistics tend to be very small, and the hypothesis testing misguided (Ranjit, 2006). The study employed the Variance Inflation Factor (VIF) to test the presence of multicolinearity. The Decision Rule: "if any of the VIFs exceeds 10, it is an indication that the associated regression coefficients are poorly estimated because of multicolinearity" (Ranjit, 2006).

Table 4.8: Result of Variance Inflation Factors for Test of multicolinearity of the explanatory variables in the model.

Sample: 1986 2020
Included observations: 35

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
NOR	0.003115	21.9948	6.48682
FRR	0.002828	26.1308	8.88644

CE	0.002014	2.1767	1.899157
RE	0.005994	92.4941	6.20100
PD	0.002152	34.6178	5.71086

Source: computed from E-view 9, 2022

From the results of the VIF, none of the variables have a centered VIF above 10. This indicates that there is no presence of multicolinearity of the models. The results from the model will not likely overstate the coefficients of the regression and coefficient of determination. Thus, it can be said that the result of the coefficient are true to the relationship of the model.

Serial Correlation Test

Presence of autocorrelation (serial correlation) result in high significant value, inefficient estimation, exaggerated goodness of fit and false coefficient of regression sign (positive or negative). The study employed the Breusch-Godfrey Serial Correlation LM Test. The null hypothesis is no presence of serial correlation. The decision rule is to reject the null hypothesis if the p.value is less than 0.05 level of significance. The result is shown on Table 4.9.

Table 4.9: Breusch-Godfrey Serial Correlation result of the models

F-statistic	8.018984	Prob. F(2,27)	0.0618
Obs*R-squared	13.04264	Prob. Chi-Square(2)	0.0615

The results of the F-statistic is 8.0189 with probability value of 0.0618. Since the p.value is greater than 0.05, we cannot reject the null hypothesis of no serial correlation. The study thus concludes that there is no serial correlation (of time series) in the model. This confirms that the nature of the relationship (negative or positive) as found in the estimation from the ARDL are correct and true of the model characteristics. As well, the significance values are correct as estimated. This implies that the result of the test of hypothesis from the ARDL gives correct position of poverty reduction in Nigeria.

Hypotheses Testing

The hypotheses are tested separately for the long run and short-run effects. The statistics for test of hypotheses were based on Bound test, ARDL and Causality analysis.

Test of Hypothesis One

There is no significant relationship between federal government retained revenue and poverty index in Nigeria.

The t-statistics from ARDL showed p.values that are less than 0.05 level of significance at the initial period, lag 1 and lag 4 respectively. The causality test has F-statistics with p.values greater than 0.05 level of significance. The study thus rejected the null hypothesis and concluded that federal government retained revenue has significant effect but no causal relationship on poverty reduction in Nigeria.

Test of Hypothesis Two

There is no significant relationship between recurrent expenditure and poverty index in Nigeria.

The t-statistics from ARDL showed p.values that are less than 0.05 level of significance at period of lags 2, 3 and 4, respectively. The causality test has F-statistics with p.values greater than 0.05 level of significance. The study thus rejected the null hypothesis and concluded that recurrent expenditure has significant effect but no causal relationship on poverty reduction in Nigeria.

Test of Hypothesis Three

There is no significant relationship between government capture expenditure and poverty index in Nigeria.

The t-statistics from ARDL showed p.values that are less than 0.05 level of significance at the initial, lags 1, 2 and 4 initial period, respectively. The causality test has F-statistics with p.values greater than 0.05 level of significance. The study thus rejected the null hypothesis and concluded that capital expenditure has significant effect but no causal relationship on poverty reduction in Nigeria.

Test of Hypothesis Four

There is no relationship between non oil revenue and poverty index in Nigeria.

The t-statistics from ARDL has p.values that are less that 0.05 level in the initial period (NOR), lag 1 (NOR -1), lag 2 (NOR -2) and lag 4 (NOR -4). The causal analysis showed that p.value for NOR to PI is less equally to (≤) 0.05, and p.value for PI to NOR is greater than (>) 0.05. The study thus posited that non-oil revenue has a significant effect and unidirectional causality from non-oil revenue to poverty reduction in Nigeria.

Test of Hypothesis Five

There is no relationship between public debt and poverty index in Nigeria.

The ARDL t-statistics and the corresponding p.values showed that only the lag 3 period is statistically significant. The causal analysis showed that p.value for PD to PI is less equally to (≤) 0.05, and p.value for PI to PD is greater than (>) 0.05. The study thus posited that public debt has a significant effect and unidirectional causality from public debt to poverty reduction in Nigeria.

Discussion of Results

The findings from the study have shown long run relationship between fiscal policies and poverty in Nigeria. This implies that poverty can be alleviated through the instruments of fiscal policy. The government control of her public debt profile, non-oil revenue diversification and spending is expected to achieve low poverty index over the years. This follows the postulations of the Keynesian crowing in theory of investment and growth. This says that increased government expenditure will come from improved revenue, which entails expansionary fiscal policy. This strategy will only lead to a minimal increase in interest rate, and thus increased government spending will bring about increased economic output. Following this Keynesian view, the principle of fiscal multiplier would respond to expansionary fiscal policy and thus, a change in the government spending would generate a greater change in the output level of the economy capable of reducing poverty for the citizenry.

Based on the specific contributions of the explanatory variables, the study found a mixed direction of effects from non-oil revenue, federal government retained revenue, capital expenditure, and recurrent expenditure. Non-oil revenue showed initial negative effect of -5.771142 and then consistent positive effects of 8.383701 through the short run periods.

This result is in line with the work of Sennoga & Matovo, 2013 and Modebe& Imo, 2012. The federal government retained revenue showed initial positive effect of 4.930734 followed by negative effect of -6.570166 and a return on positive effect within the short run period. The government capital expenditure had similar trend as the federal government retained revenue but started with progressive negative effects of -6.385936 and -6.786381 in the initial period and first lag and then swung between positive and negative effects within the short run periods whereas government recurrent expenditure started out with three year lagged period positive effects of 3.069536, 5.976088 and 4.406814 but ended with negative effect -7.978000 this is in line with the work of Anderson &Okoro, 2018. It was only the public debt profile that out rightly showed negative effects of -3.760949 and -1.323569 in first and second lag but returned positive in the third lag (3.415523), this result negates the *a priori* expectation but it is in line with work of Omari & Muturi, 2016. These juxtaposing short run effects explain the unstable nature of fiscal policy stance in Nigeria and the expected short run outcomes.

V. CONCLUSION AND RECOMMENDATIONS

Conclusion

The study has shown that fiscal policies are determinants of poverty index in Nigeria. There was a long run as well as short run significant relationship between fiscal policy variables and poverty reduction. The relationships in fiscal policy and poverty index nexus gyrates between negative and positive status within a short run period. Non-oil revenue and public debt are major causes of poverty reduction in Nigeria. Policies that modify non-oil revenue and public debt profile fine-tunes the poverty index in Nigeria.

Recommendations

Based on the findings of the study, the following recommendations were made;

1. Having found that non-oil revenue granger causes poverty reduction in Nigeria; there is need for diversification of the Nigeria economy to attract more non-oil revenue that will expand the revenue base of the economy.
2. It is also recommended for increased revenue mobilization by both federal and state government to enhance government expenditure on capital project. Despite that capital expenditures do not directly cause poverty reduction in Nigeria, they have both long and short run effect in determining the outcome of poverty index in Nigeria. It is therefore expected that increased government expenditure will improve human capital and social welfare and thus enhancing poverty reduction in Nigeria.
3. It is equally recommended for improved federal government retained revenue. Federal government should stabilize major macroeconomic indicators that will improve the economy.
4. The study also recommended that emphasis be placed on labor-intensive strategy to reduce poverty by increasing employment and improving the opportunities for productive activities among the poor.
5. The result of the study that public debt has negative effect on poverty reduction suggests that government should reduce public borrowing. This means that any infrastructural development achieved by borrowing, will put the citizenry into deeper poverty in the future. This is because of the established fact that public debt has a negative effect on poverty in Nigeria especially on the long run.

Contribution to Knowledge

This study has advocated the need for economic diversification and reduced public debt. The current model employed to study fiscal policy and poverty index nexus is novel and unique to Nigeria's economy. The Nigeria economy is known to pay much attention to federal allocation, public debt and how to diversify non-oil economy.

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