PUBLIC EXPENDITURE AND POVERTY NEXUS IN NIGERIA: FURTHER EVIDENCE

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ABSTRACT

The objective of the paper is to investigate the nexus between public expenditure and poverty in Nigeria. The ARDL approach to error correction mechanism is employed for analysis of data spanning 1981–2019 periods. The study used per capita consumption as a proxy for poverty while government expenditure was disaggregated into capital and recurrent for the purpose of robustness. The empirical evidence indicates that recurrent government expenditure affects poverty in the short-run while weak evidence was found in the long-run. Government capital expenditure and FDI were observed to be weak determinants of poverty as revealed by the short and long-run estimates. The study further found that real-GDP affects poverty significantly in the short-run while weak evidence was established in the long-run. Stability and reliability of the ECM model was tested using CUSUM and CUSUM-Squares plots. Based on the findings, the study recommends for policy consideration, the need for government to focus more expenditure not only on recurrent expenditure but also on public expenditure on infrastructure, sound education, quality healthcare, good transportation system and conducive environment capable of stimulating growth and thereby translating to poverty reduction.

Keywords: Government expenditure, Poverty, Unit root tests, ARDL model, Stability test

JEL Code: C22, C32, H52, H76, P3.

1. INTRODUCTION

Public expenditure stands for the annual spending by thegovernment (at all levels) to achieve some macroeconomic objectives which include poverty reduction, increase in national productivity and macroeconomic stability. Nigeria is a country

endowed with a resourceful population and a wealth of natural resources which offers tremendous potential for economic growth. Despite her rich human and material resources, the countryhas overtaken Indian as the poverty capital in the world,as 86.9 million Nigerians now living in extreme poverty representing nearly 50 per cent of its estimated over 160 million population (World Poverty Clock, 2018). HDR (2019) in its analysis on the multidimensional poverty index in Nigeria reported that 51.4percent of the population (98,175 thousand people) are multi-dimensionally poor while an additional 16.8% are groupedas susceptible to multi-dimentional poverty (32,091 thousand people). The breadth of deprivation in Nigeria, which is the average deprivation score experienced by people in multi-dimensional poverty, is 56.6 percent. The share of the population that is multi-dimensionally poor, adjusted by the intensity of deprivations is 0.291, as shown by Multi-dimensional Poverty Index (MPI).

Records submit that Nigerian government has spent hundreds of millions of dollars in funding National Programmes for Eradication of Poverty, yet poverty remains persistentin spite of huge amount of public expenditure. Despite the austerity measures that was introduced in the 80s to mitigate the high levels of unemployment and other social dislocations which are concomitant to privation, poverty levels has remained unabated.Research have also shown that despite huge annual budgetary allocations by government both at the national and sub-national levels, countless number of households still find it thornytoafford the basic necessities of life for their homes and this has strained their ability to cope with adverse economic conditions. Key socio-economic indicators such as life expectancy, income inequality, maternal and infant mortalities,indicate poor outcomes. From the foregoing, it is apparent that as public expenditure rises yearly; both social and economic indicators have continued to wane. It is therefore imperative to question the impact and effectiveness of public expenditure, especially those allocations made to target redistribution of income and poverty alleviation.This informed the focus of the study.

It was also observed that empirical literature on the impact of government expenditure on poverty is still evolving in Nigeria, because of the compositions of government expenditure and the measure of poverty applied. Also, the debate on the impact of government expenditure on poverty reduction remains inclusive. Several studies have showed that mixed findings exist between government expenditure and poverty. For instance, studies on significant positive association between government expenditure and poverty are found in the following studies (Sasana & Kusuma, 2018; Oriavwote & Ukawe, 2018; Omari

& Muturi, 2016; Sasmal & Sasmal, 2016 and Dahmardeh & Tabor, 2013). On the other hand, studies on negative evidence are found in Asimiyu and Saidi (2015); Adelowokan and Osoba (2015); Nwosa, 2014; Asghar *et al.* (2012) and Mehmood and Sadiq (2010). While evidence of weak or no association between poverty and government expenditure are found in Anderson *et al.* (2018), Owuru and Farayibi (2016), Kazungu and Cheyo (2014), Sunkanmi and Abayomi (2014). Therefore further studies are required to clarify the debate on the mixed findings between government expenditure and poverty.

This study will therefore represent a contribution to the extant literature, especially in the area of recent data and the methodology applied. The study employs the ARDL approach to error correction analysis developed by Pesaran, Shin and Smith (2001). The choice of this method was informed by the reasoning that it could be used when data series having mixed order of integration and also, it is relatively more efficient in the case of small and finite data sizes, and it produces unbiased estimate of the long run model with a valid t-statistic in spite of regressor endogeneity (Harris & Sollis, 2003).

The study is divided into five parts. After the introductory section, highlights of literature review is presented in section 2. Section 3 reports methodology, featuring model specification, estimation procedures and sources of data, while section 4 presents and discusses empirical results. Section 5 concludes and provides policy recommendations for the study.

2. LITERATURE REVIEW

2.1. Foreign Studies

Sasana and Kusuma (2018) employed multiple fixed-effects model (FEM) to analyse the effect of government expenditure on poverty reduction in Indonesia from 2008 to 2013. The study found that economic factors had positive impact on poverty reduction in Indonesia while government outcome which includes government spending had a significant negative effect on poverty level. In another study, Anderson *et al.* (2018) made use of meta-regression to analyse the relationship between government spending and income poverty rate of the low and middle income countries. The study largely established that higher government spending did not play any significant role in income poverty reduction of the low and middle income countries under review.

Omari and Muturi (2016) examined the effect of government sectoral expenditure on poverty level in Kenya using time series data covering a period

from 1964 to 2010. The findings revealed that expenditures on agriculture and health exerted a significant positive impact on levels of poverty. Though the effect of education expenditure was not significant but expenditure on infrastructure had significant negative effect on poverty level. Sasmal and Sasmal (2016) using both fixed and random effects models, investigated the impact of public expenditure on economic growth and poverty alleviation in India. The findings revealed that public expenditure on infrastructures such as road, power, irrigation, transport and communication was high as well as the per capita income and so the effect on poverty reduction was positive and significant.

Kazungu and Cheyo (2014) assessed the effect of government spending on boom techniques and poverty decrease in Tanzania and observed that authorities expenditure on social services reduced income poverty ramblingly, even though the work opined that the outcomes will be found out in the long run. Dahmardeh and Tabor (2013) used Autoregressive Distributed Lag (ARDL) approach to observe the outcomes of government expenditure on poverty reduction in Sistan and Baluchestan Province of Iran from 1978 to 2008. The end result showed that government optimistic spending had a positive effect on poverty reduction. Sennoga and Matovu (2013) examined the impact of public spending on financial boom and poverty discount in Uganda using a dynamic computable general equilibrium model. The study discovered proof that investments in agriculture and infrastructures contribute to higher monetary increase and boost up the rate of poverty reduction.

Asghar *et al.* (2012) also reviewed the effect of government spending on poverty discounts in Pakistan using annual time series data from 1972 to 2008. The research revealed evidence that authorities spending on training, to preserve law and order contributed extensively to reduce poverty at the same time as expenditures on finances deficit, community, and financial services were discovered to have a poor impact on poverty in Pakistan. In a comparable study, Mehmood and Sadiq (2010) employed the error correction version to observe the relationship among authorities' expenditure and poverty decrease in Pakistan from 1976 to 2010. The result set up evidence of a negative relationship between government expenditure and the poverty level in Pakistan.

2.2. Domestic Studies

Oriavwote and Ukawe (2018) studied the impact public expenditure on poverty reduction in Nigeria. The work covered the period between 1980 and 2016 and made use of ordinary least squares technique. The results confirmed that public

expenditure on training and health had sizeable and positive effect on in line with capita earnings (measure of poverty). In addition, the result also confirmed that government expenditure on building and construction similarly had a substantial and effective effect on PCI.

Owuru and Farayibi (2016) used economic coverage measures to address the issue of poverty reduction in Nigeria from 1980 to 2011. The findings revealed that the level of government capital investments in Nigeria couldn't alleviate poverty within the period covered by the study. In a further study, Asimiyu and Saidi (2015) examined the effect of public budget and aggregate expenditure on the degree of poverty in Nigeria using annual time series data examined over the period from 1980 to 2013. The studt revealed that federal government revenue and aggregate spending impacts negatively on poverty rate in Nigeria.

Adelowokan and Osoba (2015) used ordinary least squares approach and granger causality test to assess the role of oil revenue and public spending in decreasing poverty level in Nigeria from 1970 to 2013. The study discovered evidence that oil revenue and GDP exerted negative effects on poverty rate in the period being investigated. Nwosa (2014) made use of annual time series statistics masking a period from 1981 to 2011 and ordinary least squares method to study the impact public expenditure on unemployment and poverty rates in Nigeria. The study found that budgeting expenditure had a significant positive effect on unemployment level while on poverty rate, insignificant negative effect was observed.

Enyim (2013) employed ordinary least squares technique and a data masking a period from 1980 to 2009 to investigate the impact of government spending on poverty reduction in Nigeria. The regression results confirmed that government expenditure had a significant positive effect on poverty reduction in Nigeria. Olabode (2012) used Dynamic ordinary Least Squares (DOLS) technique to study the impact of defence expenditure on poverty reduction in Nigeria. The study shows evidence that defence expenditure had positive association with poverty indicator. however, military expenditure, secondary school enrolment and output per capita had negative relationship with poverty degree.

3.   METHODOLOGY

3.1. Model Specification and Sources of Data

Consistent with the objectives of the study, the paper investigated the connection between government expenditure and poverty in Nigeria. Following Nurudeen

and Usman (2010) and Osemwengie and Sede (2013) the study specifies the model to investigate the nexus between government expenditure and poverty in Nigeria, but with some modification by incorporating FDI and RGDP variables as:

$$PCC = f\,(GRE,\ GCE,\ RGDP,\ FDI) \tag{1}$$

Where: PCC = Per Capita Consumption; GRE = Government Recurrent Expenditure; GCE= Government Capital Expenditure; RGDP = Real Gross Domestic Product; FDI = Foreign Direct Investment. On the a priori, we expect; F1 > 0, F2> 0, F3 > 0, F4 > 0.

The ARDL approach to error correction analysis is employed to investigate the long run and short run effects of government expenditure as well as other control variables on poverty variable (proxy by per capita consumption).

The error correction model of equation 1 is specified econometrically as:

$$
\begin{aligned}
\Delta PCC_t = \beta_0 &+ \sum_{k=1}^{p} \beta_{1k} \Delta PCC_{t-k} \\
&+ \sum_{k=1}^{q_1} \beta_{2k}\, \Delta GRE_{t-k} + \sum_{k=1}^{q_2} \beta_{3k} \Delta GCE_{t-k} + \sum_{k=1}^{q_3} \beta_{4k} \Delta RGDP_{t-k} \\
&+ \sum_{k=1}^{q_4} \beta_{5k} \Delta FDI_{t-k} + \varphi ECM_{t-1} + \mu_{1t}
\end{aligned}
\tag{2}
$$

The associated long run model is specified as:

$$
\begin{aligned}
\Delta PCC_t = \alpha_0 &+ \sum_{k=1}^{p} \alpha_{1k} PCC_{t-k} \\
&+ \sum_{k=1}^{q_1} \alpha_{2k}\, GRE_{t-k} + \sum_{k=1}^{q_2} \alpha_{3k} GCE_{t-k} + \sum_{k=1}^{q_3} \alpha_{4k} RGDP_{t-k} \\
&+ \sum_{k=1}^{q_4} \alpha_{5k} FDI_{t-k} + V_{1t}
\end{aligned}
\tag{3}
$$

The variables are previously defined. Δ is the first order difference operator, ECT is the error correction term included in the model to reconcile the short run dynamics with the long run relationship. φ is predicted to be negatively

signed and statistically significant to function as error correction in the model. μ_{1t} and V_{1t} are the residual or error terms.

The study used Augmented Dickey-Fuller technique to unit root test to investigate the stationarity properties of the variables employed. Unit root testing in empirical studies are very important so as to eliminate the presences of biasedness and inefficiency so as to guarantee stable and reliable estimates. In addition, a two-step cointegraion test procedure proposed by Engle and Granger (1987) is adopted. This technique of cointegration requires that residual series of an estimated OLS equation to be tested for unit root in levels, and stationarity means cointegration among the variables that generated the residual series. This technique to cointegration is very appropriate for the case of single-equation system. Hence, why it is deployed in this study

The study employed secondary data obtained from the Central Bank of Nigeria's Statistical Bulletin, World Development Indicators of the World Bank, and the Annual Abstract of Statistics of the National Bureau of Statistics covering the period 1981 to 2019.

4.   DISCUSSION OF EMPIRICAL RESULTS

4.1. Unit Root Tests Results

This section presents unit root tests results using Augmented Dickey-Fuller (ADF) approach to unit root test. The results outputare presented in Table 1.

Table 1: ADF Unit Root Tests Results

Variables	*Level*			*1st Difference*			
	ADF Statistics	*Prob.*	*Inference*	*ADF Statistics*	*Prob.*	*Inference*	*Integration Order*
PCC	-2.9451	-3.5628	NS	-9.7312	-3.5577	S	I(1)
RGDP	0.0973	-2.9511	NS	-3.2293	-2.9511	S	I(1)
GCE	-1.6792	-3.5806	NS	-5.7427	-3.5806	S	I(1)
FDI	-3.4331	-3.5529	NS	-7.8699	-3.5577	S	I(1)
GRE	1.0057	-3.5366	NS	-4.6514	-3.5628	S	I(1)

Note: NS = Non stationary; S = Stationary
Source: Authors' estimation using EVIEWS 9

From the ADF unit root tests results presented in Table 1, all the series (PCC, RGDP, GCE, FDI and GRE) are integrated of order 1, that is, they are

difference stationary judging by their ADF probability at 5 per cent level which is lesse than their ADF critical statistics. We therefore conclude that all the variables are unit roots free after first differencing. In what followed, we proceeded to ascertain whether a long run relationships exist between the variables in the ECM model.

4.2. Co-integration Test Result

The study adopted the Engle-Granger single equation approach to co-integration. This approach uses the residual unit root test in levels as proposed by Engle and Granger (1987).

The result is presented below.

Table 2: Co-integration Test Result
(Based on Residual Unit Root Test)

Variable	ADF Statistics @ Levels	Probability @ 5%	Inference	Integration Order
RESIDUAL	-4.1161	-3.5529	S	I(0)

Note: NS = Non stationary. Source: Authors' output using EVIEWS 9

From the result in Table 2, the ADF statistic value of -4.1161 is greater than the critical value of -3.5529 at 5 per cent level of significance. This suggests that the residual is stationary in levels. We therefore conclude that cointegrating relationships or equilibriumexist between the variables in the long run. Thus, the presence of cointegrating relationships between the variables justifies the use of ECM technique in the study. We therefore represent the short run (dynamic) relationship with an error correction model (ECM).

4.3. Estimated ARDL Error Correction and Long-Run Poverty Model

This technique became necessary when we established a cointegrating long run relationshipsbetween the variables in the model. This procedure attempts to reconcile the short run (dynamic) relationship with the long run equilibrium due to the loss of some vital information in the process of integrating. The test required the cointegrating coefficient to be negative, significant as well as lies between zero and one. The results are reported in Table 3 below.

Table 3. ARDL Cointegrating and Long-Run Estimates

Dependent Variable: PCC
Selected Model: ARDL(2, 0, 2, 2, 1)
Sample: 1981 2019
Included observations: 32

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PC(-1))	-0.313029	0.147787	-2.118107	0.0469
D(FDI)	0.993913	25.912402	0.038357	0.9698
D(GRE)	-1.064001	0.434132	-2.450870	0.0236
D(GRE(-1))	-0.393067	0.341230	-1.151913	0.2629
D(GCE)	0.119898	0.421590	0.284394	0.7790
D(GCE(-1))	-1.959129	0.698263	-2.805717	0.0109
D(RDGP)	0.178758	0.057562	3.105484	0.0056
CointEq(-1)	-0.327680	0.141672	-2.312948	0.0315

R-squared = 0.9090; R-bar-squared = 0.8590; F-stat.= 18.1771; Prob (F-stat.) = 0.0000; DW-stat = 2.2496

Long Run Coefficients

FDI	3.033181	79.562274	0.038123	0.9700
GRE	-1.569532	1.537920	-1.020555	0.3197
GCE	3.607370	3.012368	1.197520	0.2451
RDGP	0.071623	0.092356	0.775517	0.4471
C	257.825967	1618.522951	0.159297	0.8750

Source: Authors' Estimate using Eviews 9.0

The diagnostic statistics from the results presented in Table 4.3 reveals that the model has a high goodness of fit as indicated by the adjusted coefficient of determination which shows that about 86 per cent of the systematic variations in the dependent variable is explained by the variations in the regressors altogether. The F-statistic value of 18.1771 with p-value of 0.0000 passes the test of statistical significance at 1% level of significance, thus indicating that the explanatory variables are jointly significant in the determination of the dependent variable. The Durbin-Watson (DW) statistic of 2.2496 reveals absence of first order negative serial correlation in the model.

More so, short and long run effects of FDI on per capita consumption (proxy for poverty) is positive but statistically not significant as indicated in

Table 3. Both the short and long run conform to the predictions of the per capita consumption theories. The non-statistical significance suggests that FDI growth has not being able to stimulate consumption in the Nigeria economy, as most of the foreign investments are portfolio base. This has little or no effects on the consumption level of the individuals so as to lift them above poverty level. FDI targeted at providing quality healthcare, sound education and quality infrastructure would be very germane to eradicating poverty particularly for developing and emerging economy like Nigeria.

The negative sign on the coefficient of government recurrent expenditure variable in the short and long run results do not conform to *a priori* expectation, though significant at 5 per cent level in the short run only. This implies that government recurrent expenditure can only affects per capita consumption in the short run but has a weak impact on the long-run. This finding suggests that recurrent expenditure can only support "stomach infrastructure" of the citizenry but lack the capacity to provide "sustainable infrastructure" (basic means of living, for instance, decent houses, quality healthcare, good education, etc) capable of lifting the citizenry from the sphere of poverty. The unexpected sign further implies that the returns from recurrent expenditure on per capita consumption tends to diminishes after a year. The nature of data and the proxies employed could also provide explanations for the negative sign.

Government capital expenditure is observed to be positive but not a significant determinant of per capita consumption (proxy for poverty) in both the short and long run estimates. While the coefficients (short and long run) conform to *a priori* expectation, the non-significance or performance of the variable to poverty reduction is not quite surprising in the Nigeria context, given that funds allocated to capital projects in the budget are usually very meagre compared to recurrent expenditure. Capital projects such as adequate power (electricity), effective and efficient transportation system, quality education, excellent healthcare system, decent environment, etc, are the only factors capable of stimulating economic growth and therefore assist to reduce poverty. All of these are currently lacking in Nigeria.

Real gross domestic product (RGDP) from the result in Table 3 is observed to positively and significantly relate to per capita consumption contemporaneously in the error correction model in the short run. This isin conformity with theoretical expectation. Also, it underscores the relevance of economic growth to poverty alleviation. But this significant positive relationship between per capita consumption (proxy for poverty) only exist in the short run

while in the long run, though positive, weak connection was observed. This implies that growth in the economy has not been able to sustain progress and prosperity in the country so as to lift the citizenry from poverty trap in the long run.

The error correction term (CointEq(-1)) in the error correction model is negatively signed as expected. Also, it is statistically significant and its absolute value lies between one (1) and zero (0). The coefficient which measures the speed of adjustment of PCC to its equilibrium level in the event of short-run deviation from the equilibrium indicates that 32 per cent of the short-run deviation from equilibrium is offset by short-run adjustments yearly to restore the equilibrium. The speed of adjustment to equilibrium is fairly slow.

4.4. Test of Structural Stability for the PCC Model

The stability of the model was investigated using the plots of CUSUM and CUSUM of Squares. The plots are reported in Figure I and II.

The stability of the model was proved by the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of recursive residuals square (CUSUMSQ). Figure 1 and 2 show both plots of the series lies within the critical bounds test at 5 per cent level of significancewhich confirmed that the model is stable and reliable for policy direction.

Figure 1: Plot of CUSUM for the PCC Model

Figure 2: Plot of CUSUM of Squares for the PCC Model
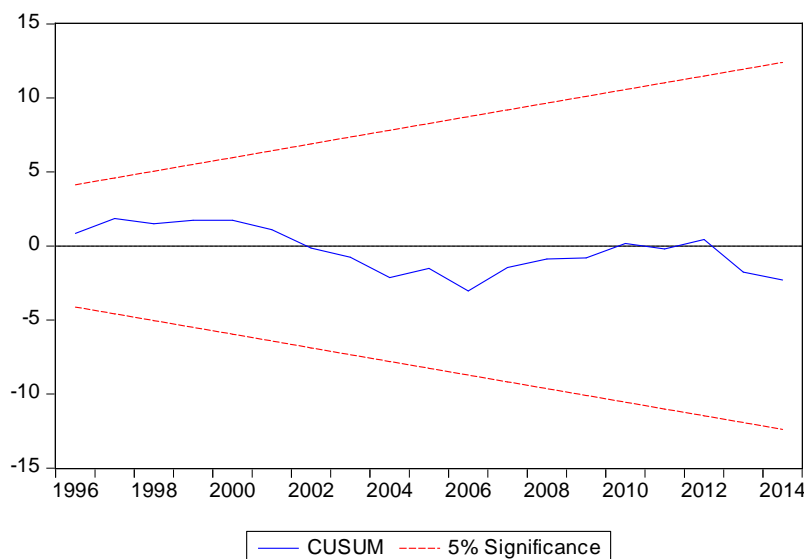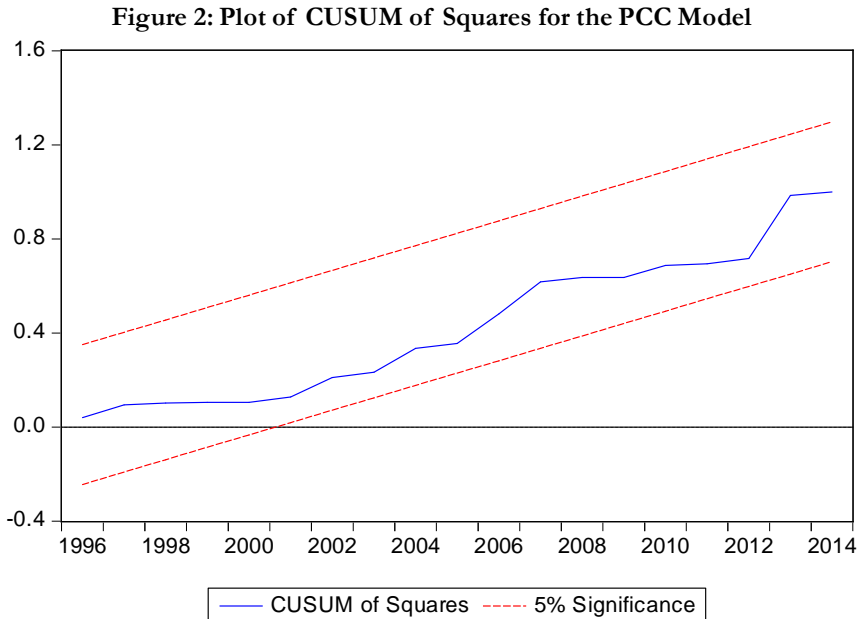
5. CONCLUSION AND RECOMMENDATIONS

The paper has investigated the nexus between government expenditure and poverty in Nigeria using data that spans the period from 1981 to 2019. The ARDL approach to cointegration and error correction were utilized for the investigation. The study finds that government recurrent expenditure had a significant impact on per capita consumption (proxy for poverty) in Nigeria in the short run while in the long run, a weak relationship was observed. For capital government expenditure, a weak relationship was observed, as the variable under performed in both the short and long run periods. This strongly underscored the fact that capital expenditure of government is not a significant determinant of per capital consumption in Nigeria. Similar finding, was observed by FDI. FDI proved to be a weak determinant of per capita consumption in both the short and long run periods. Finally, RGDP proved to impact significantly on per capita consumption on the short run period. However, the long run results showed that economic growth proxy by RGDP could not support poverty alleviation in the long run as it has a modest impact on per capita consumption.

In view of the finding that recurrent expenditure affects poverty in the country, policies aimed at reducing (or narrow) income inequality gap (poverty) should be formulated and implemented. Based on the empirical evidence from the estimated PCC model, we recommend that economic growth should be

stimulated so as to translate to growth in consumption and thereby reduce poverty incidence. Also, sustainable FDI inflows for capital projects on healthcare, education, transportation sector and energy should be attracted to facilitate economic growth which will eventually assist to reduce poverty level in the country. Government expenditure on capital projects tailored towards infrastructural development should be encouraged and propagated. In conclusion, the study finds evidence of a short run relationships between government expenditure (recurrent) and poverty in Nigeria.

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