

Investment, Public Spending and Income Growth: Implication for Poverty Reduction Policy in Nigeria

ADELOWOKAN¹, Oluwaseyi A. ALIMI², Olorunfemi Y.

Department of Economics, Olabisi Onabanjo University, Ago-Iwoye, Ogun-state, Nigeria

Abstract

This study examines the precise relationship between income and poverty rate in Nigeria within the period of 1970 and 2013. It tests for unit root, cointegration, multiple regression estimation, post-estimation and causal relations among income, government spending on health and education, investment, revenue from oil proceeds and poverty rate. The results showed that government spending on education and revenue from oil proceeds plays a greater role in reducing poverty level in Nigeria. Nevertheless, income, investment, and government spending on health deteriorate the reduction in poverty level in Nigeria. This can be adduced to bad governance and high level of corruption in our public offices which has ruined the country's resources. Therefore, there is need for good governance that promotes civil and economic liberties as they are essential for the development of citizenry initiatives and opportunity creation.

Keywords: Poverty rate, income, public spending, investment, Nigeria.

1.0 INTRODUCTION

It has generally been established that growth beneficial to the poor i.e. pro-poor growth is the first-best option. Considerable debates have argue on whether (or to what extent) growth is still “pro-poor” when it is accompanied by only one of the two conditions, that is, positive income growth of the poor or pro-poor distributional change (Klasen, 2008). This however revealed the relative aspect of poverty as Duclos & Wolon (2004) and OECD (2006) argued that the debates seem to have largely boiled down to an “absolute” and “relative” camp. Bourguignon (2003) and Klasen and Misselhorn (2006) stated that absolute poverty reduction will be faster in countries where average income growth is higher, in countries where initial inequality is lower, and in countries where income growth is combined with falling inequality. These two camps focus on the income dimension of poverty. Sen (1998), Klassen (2000), World Bank (2000) etc, note that non-income dimensions of poverty (such as poor health, education, gender inequality) are fundamentally valuable as development goals.

On the other hand, the theoretical and empirical literature on the impacts of education and health on poverty reduction noted that education benefits both the individual and society and that health is central to wellbeing for reducing poverty. At the household level, an increase in an individual's productivity and the level of income are two possible outcomes that are realised with higher education levels. Similarly, at the country level, an educated workforce is considered to be the building block for a knowledge-based economy and thus a significant contributor to economic growth.

Over the past years, the productive capacity of the Nigerian economy has been traced to the oil dependency and structural constraints embedded in the economy (Akanbi & Toit, 2011). Unfortunately, her economic fortunes has not been seen to have translated into a significant reduction in poverty level as it remains a huge challenge despite the growth in the country's gross domestic product, (see Figure I, II, III and IV). Thus, there has been a sustained increase in the trend of both the GDP and poverty since 1970, indicating the presence of serious socio-economic constraints impeding a long-term pro-poor growth in the country (Akanbi & Toit, 2011).

However, there is a drought of studies examining the precise relationship among income, investment, public spending and poverty rate in Nigeria. Thus, this study examines the impact of income, investment and public spending on poverty rate in Nigeria. This spans between the period of 1970 and 2013. Other part of this paper is structured into four sections; section two presents stylized fact and literature review while section three provides the methodology for the study. Section four reveals data presentation, analysis and discussion of findings. The last section however gave the concluding part of the study as well as policy options.

2.0 LITERATURE REVIEW¹⁴¹

2.1 Stylized Facts of Macroeconomic Performance and Poverty Rate in Nigeria

The Nigerian economy has undergone some structural changes over the past four decades. Prior to the country's political independence in 1960, the economy was largely at a rudimentary stage of development. Between 1960

¹⁴¹ Adelowokan, O. A and Osoba A.M. (2015). Oil revenue, government expenditure and poverty reduction in Nigeria (unpublished article).

and 1975, agriculture was the core of economic activities in Nigeria with manufacturing and mining playing the residual role. Thus, agricultural commodities dominated the country's export trade while the imports were dominated by manufactured goods. In spite of the dominance of agriculture, the growth rate of real GDP was very impressive (see appendix page, table 2.12). The oil boom of 1973/74 changed the economic environment dramatically. The windfall from oil boom in 1973/74 and 1979/80 had a pervasive effect on the Nigerian economy. The unexpected oil revenue flows provided the basis for large increases in public spending designed to expand socio-economic infrastructure, non-oil productive capacity (e.g., manufacturing) and human capital, among others.

Consequently, the growth rate of money supply rose from 21.8 per cent in 1973 to 52.5 and 67.9 per cent in 1974 and 1975 respectively. In addition, the oil shock also led to the general wage increase of the period. The rising wages, coupled with the appreciating domestic currency that accompanied the boom, squeezed the profitability of non-oil exports while cheap import competed with domestic food production. The oil boom did not only create a Dutch Disease effect to the agricultural sector but also made Nigeria one of the largest importers of food items with its usual negative effects on the balance of payments (BOP). This led to serious overvaluation of the Naira. Consequent upon this, the BOP position, which had been positive consecutively during 1970 - 1973 and 1978 - 1980 turned negative between 1981 and 1983. In short, revenue from oil became the mainstay of the economy with the three tiers of government depending heavily on it for growth and development.

Expectedly, when international oil prices fell sharply in the early and mid-1980s, Nigeria's economy was almost at the verge of collapse. For instance, the growth rate of real income was negative between 1981 and 1984. The country also built up large fiscal and external deficits and other macroeconomic imbalances ensued. The increase in government spending, which accompanied the oil boom, increased public sector deficit, particularly from 1975. For instance, the overall fiscal deficit rose from ₦365.8 million in 1974 to ₦4.08 billion and ₦6.21 billion in 1976 and 1978, respectively. As argued by Oyejide (1985), the deficit was financed largely by bank credits and external loans. In fact, the overall fiscal balance, as a proportion of GDP, which was positive in 1979 and 1980 suddenly turned negative and was as high as 11.8 per cent in 1982. The gap between domestic absorption (consumption + investment + imports) and national output, which narrowed down between 1975 and 1980, deteriorated substantially in 1980 and 1986 period as economic growth declined. External indebtedness also increased phenomenally. It increased from ₦1.87 billion in 1980 to ₦17.21 billion in 1985 before jumping to ₦41.45 billion in 1986. Consequently, external reserves also declined from ₦5.4 billion in 1980 to ₦2.4 billion in 1981 and by 1983 it had plunged to a mere ₦781.7 million.

To address these problems, government introduced several policy measures e.g. Stabilization Act of 1982, budget-tightening measure of 1984 and finally the Structural Adjustment Programme (SAP) introduced in late 1986. These measures, particularly SAP were aimed at building a self-reliant economy as well as diversifying the structure of the Nigerian economy through the revitalization of the manufacturing sector. Capacity utilization, a barometer of operational and productive efficiency within the manufacturing sector, which was as high as 82.4 and 75.0 per cent in 1970 and 1980, respectively declined drastically thereafter. This was as a result of the economic downturn of the early 1980s. Since the adoption of SAP in 1986, capacity utilization has been lower than what obtained in 1986. It fell from an average of 37.8 per cent in 1986 to 30 per cent in 1989. It rose to 36.9 per cent in 1990, declining systematically thereafter to 27.9 per cent in 1995, though with marginal improvement between 1996 and 1998. Most warehouses were filled with inventory of unsold finished products which resulted in retrenchment in and closure of many enterprises. Unfavourable macroeconomic and policy environments have been adduced for this dismal performance in the industrial sector.

Critical among these is the disturbing rate of inflation. The price movement which experienced all average of 3.85 per cent between 1960 and 1969 became more volatile in the 1980s, particularly after the introduction of SAP in 1986. It rose from 11.8 per cent in 1975 - 85 to 20.45 and 48.2 per cent during 1986 - 90 and 1991 - 96, respectively (see Table 2.10.) For instance, inflation rate was as high as 38.3, 57.2 and 72.8 per cent in 1988, 1993 and 1995 respectively. As shown in the table, periods of high inflation often coincided with periods of high growth rate of money supply. During this period, consumers complained bitterly about their declining purchasing power which seriously hindered effective demand in the system. This partly accounts for the piling up of inventories in many companies' warehouses. Another negative impact of the skyrocketing inflation rate is the instability that is often transferred to other macroeconomic variables, thus creating an uncondusive atmosphere for investment in the real sector of the economy. Thus, speculative and service businesses boom at the expense of productive activities. Such is the case of the past two and a half decades in Nigeria.

2.2 Empirical Review

Literature in the area has stimulated various reaction in the empirical evidence available from cross country comparisons, bearing on the relationship among oil revenue, government expenditure and poverty rate. Mitchell

(2005) evaluated the impact of government spending on economic performance in developed countries. Regardless of the methodology or model employed, he concluded that a large and growing government is not conducive to better economic performance. He further argue that reducing the size of government would lead to higher incomes and improve American's competitiveness.

More so, Chirwa (2005) examined the impact of alternative macroeconomic policies on changes in poverty level in Malawi using panel data within 1998 to 2002. The study revealed that macroeconomic policies that facilitate the redistribution of land, creation of salaried employment opportunities and accumulation of assets have the greatest potentials in reducing poverty in rural Malawi. Owoeye and Adenuga (2002) carried out a study on human capital and economic growth. They used co-integration and error correction mechanism to determine the relationship and direction of causality between growth rate and social spending. The time properties of the variables were investigated by conducting a with test using sample period starting from 1970-2000. Their results showed that all the variable were first difference stationary i.e. I(1). Their results also show that GDP co-integrated with all the explanatory variables.

Also, Ali and Thorbecke (2000), provided a detailed analysis of the state and evolution of poverty in African countries (Cote d'Ivoire, Ghana, Nigeria and Uganda), as well as the characteristics of the poor in both rural and urban areas. The study analysed the effects of growth and income distribution on spread, depth and severity of poverty for rural and urban areas. It conducts the sensitivity of poverty to changes in economic growth and income distribution, and found that growth has a bigger effect on poverty in rural than in urban areas. The study also analysed time changes in poverty for several African countries (Cote d'Ivoire, Ghana, Nigeria and Uganda), using a well known decomposition method. The study found a substantial effect of distributional policies on poverty. Specifically, the findings from the study revealed that irrespective of growth performance of countries, poverty fell in the two countries where inequality declined (that is, Ghana and Cote-d'Ivoire) and increased in countries where inequality worsened (Nigeria and Uganda).

In a similar study, Ogwumike (2010) discussed the various approaches to the measurement of poverty and inequality, applying such approaches to Africa. The study reviewed the methods for assessing how inequality, poverty and economic well-being in a given country or region have changed over time. Of particular interest to this study are the relationships among economic inequality, economic growth and poverty. The study fund that the Kuznets long run inverted- U relationship between inequality and economic growth is not discernible from African data. The findings from the study revealed that it is not the rate of economic growth or the stage of economic growth that determines whether income inequality increases or decreases, but rather the kind of economic growth witnessed. With regard to the evolution of poverty, Fields (2000) reported that there is currently little or no consensus in the literature on the relative effects of growth and distribution. Thus, inconclusive reports in Africa necessitated the need for understanding poverty from macroeconomic perspective.

Furthermore, Datt and Ravallion (1992), corroborated this argument by stating that when the poverty line is held constant overtime, poverty reduction effects of growth are overstated and the contribution of improvements in income distribution are underestimated and vice versa. Thus, the proper understanding of the concept of poverty may be critical to resolving this important debate of the relative importance of economic growth and income distribution for poverty reduction.

III MODEL SPECIFICATION AND ESTIMATION TECHNIQUES

This study employed and modified the model of Ijaiya, Ijaiya, Bello & Ajayi (2011) to estimate the precise relationship among income, investment, public spending and poverty rate in Nigeria. The model expresses poverty rate (POV) has a function of income (INC), gross capital formation (GCF), government spending on health (GSH), government spending on education (GSE) and revenue from oil proceeds (ROP). It is thus presented below as thus:

$$POV = \beta_0 + \beta_1 INC + \beta_2 GCF + \beta_3 GSH + \beta_4 GSE + \beta_5 ROP + \mu \quad (3.1)$$

The logarithm value of income (INC), gross capital formation (GCF), government spending on health (GSH), government spending on education (GSE) and revenue from oil proceeds (ROP) are expressed in smaller case. This is expressed as thus:

$$POV = \beta_0 + \beta_1 inc + \beta_2 gcf + \beta_3 gsh + \beta_4 gse + \beta_5 rop + \mu \quad (3.2)$$

Where β_0 is constant, β_{1-5} are coefficients or elasticities and μ is the disturbance term.

A priori expectation anticipates poverty rate to be negatively related to the host country's income, gross capital formation, government spending on health, government spending on education and revenue from oil proceeds. For the purpose of this study, only secondary method of data collection is employed to establish the relationship. Annual (secondary) data of the variables are used, and they were collected from the Central Bank of Nigeria statistical bulletin, 2014 and World Development Index (WDI), 2014. Annual (secondary) data of the variable are used for the period of 1970 to 2013.

The model is estimated using the Ordinary Least Squares (OLS) for long-run estimates, which consists

of the R-square (R^2), F-statistic and t-test. The R-square (R^2) is concerned with the overall explanatory power of the regression analysis, the F-statistic is used to test the overall significance of the regression analysis and the t-test is used to test the significant contribution of the independent variables on the dependent (Oyeniyi 1997). Before estimation, we performed a stationarity (unit root) test using Augmented Dickey Fuller (ADF) that excludes the intercept and trend and Engel Granger cointegration test for long-run relationship. Furthermore, we also conducted the Granger causality test to show the causal relationship among variables of interest.

IV EMPIRICAL ANALYSIS AND DISCUSSIONS

4.1 Unit Root Test Analysis

The stationary test results of the incorporated times series variables in the regression model expressed previous section is presented in Table 4.1 using the Augmented Dickey-Fuller (ADF) unit-root test. The test result indicated that the time series variable, income (INC), gross capital formation (GCF), government spending on health (GSH), government spending on education (GSE) and poverty rate (POV) were not found to reject the null hypothesis “no stationary” at level. This implies that these series are not stationary at levels i.e. first-difference of this series is *mean reverting* and stationary. Then, the series is integrated of order one i.e. I(1). However, revenue from oil proceeds (ROP) is stationary at level i.e. integrated at order zero [I(0)]. Thus, it was found not to reject the null hypothesis “no stationary” at level but after several iterations based on the number of lag length and differencing, the series were found to reject the null hypothesis at first difference. This indicates that the first-difference of those series is *mean reverting* and stationary.

Table 4.1: ADF Unit Root Test Results

Series	T-ADF Statistics	Order of Integration
GCF	-4.6903 (1) -4.1985*	1
GSE	-4.4605 (0) -4.1923*	1
GSH	-3.5363 (0) -3.5966**	1
INC	-3.4463 (1) -3.1929**	1
ROP	-6.5038 (8) -3.6329	0
POV	-4.9829 (0) -3.5966	1

Note: *, ** & *** denote 1%, 5% and 10% significant level respectively.

Source: Author’s computation (2015).

Subsequently, econometric literature has indicated that linearly combining or regressing a non-stationary series on non-stationary and stationary time series might yield spurious regression and render estimated parameters inefficient. Thus, this argument prompts the cointegration test to examine if the linear combination of our considered poverty rate determinants.

4.2 Cointegration, Long-Run Estimates and Diagnostic Test

The long-run relationship between income, investment, public spending and poverty rate in Nigeria between 1970 and 2013 was examined using the Engle-Granger cointegration technique and the test results are shown on Table 4.2.

Table 4.2: Engle-Granger Cointegration Results

Series	ADF Test at Level		Decision
	T-ADF Statistics	Critical Value	
$ECT = u = POV - \left(\alpha + \beta_1 gcf + \beta_2 gse + \beta_3 gsh + \beta_4 inc + \beta_5 rop \right)$	1% level: -3.5924 5% level: -2.9314 10% level: -2.6039	-3.2273 (0.025)	Stationary i.e. Cointegrated

Source: Author’s computation (2015).

The cointegration result presented in Table 4.2 indicated that the estimated residual (ECM) from the main empirical model was found to be stationary at level. This indicates that the null hypothesis of “no cointegration” was rejected at 5% significance level. This implies that there exist long-run relationships among government spending on education (GSE), gross capital formation (GCF), government spending on health (GSH), income (INC), revenue from oil proceeds (ROP) and poverty rate (POV) in Nigeria between 1970 and 2013. Thus, there is long-run relationship between all the incorporated income, government spending, investment, oil revenue and poverty rate in Nigeria.

The cointegrating equation was estimated using the ordinary least square (OLS) method and the long-run estimates were presented on Table 4.3. The estimates of the long-run model that captures the effect of

income and macroeconomic variables contribution (such as government spending and oil revenue) on poverty rate in Nigeria between 1970 and 2013 indicated that government spending on education (gse) and revenue from oil proceeds (rop) exert negative effect on poverty rate (POV) in Nigeria during the reviewed period. They were found to be in tandem with theoretical expectation as they were able to reduce poverty in Nigeria. In magnitude term, a percentage change in government spending on education (gse) and revenue from oil proceeds (rop) reduce poverty rate by 48.1% and 0.32% respectively. However, only government spending on education has significantly impact poverty rate by 5% significance level.

Table 4.3: Estimated Long-Run Model Results and Diagnostic Test

Dependent Variable: POV				
<i>Method: Least Squares</i>				
Observation (n) = 44				
Variable	Coefficient	Std. Error	TStatistics	Prob.
<i>C</i>	217.2022	126.0714	1.7229	0.0930
<i>Gcf</i>	8.8982	2.1139	4.2095	0.0002
<i>Gse</i>	-48.0476	21.1436	-2.2724	0.0288
<i>Gsh</i>	30.9530	20.6037	1.5023	0.1413
<i>Inc</i>	0.25015	0.1057	2.3658	0.0197
<i>Rop</i>	-0.3147	2.1114	-0.1491	0.8823
R-squared	0.9036	Durbin-Watson stat		1.7743
Adjusted R²	0.8910	F-statistic		71.2649
S.E. of regression	6.4015	Prob(F-statistic)		0.0000
<i>Residual Normality Test</i>				
Jarque-Bera	1.0904	Prob(J.B)		0.5797
<i>Breusch-Godfrey Serial Correlation LM Test</i>				
F-statistic	13.1520	Prob. F(2, 36)		0.0001
Obs*R-squared	18.5763	Prob. Chi-Square(2)		0.0001
<i>Heteroskedasticity Test: Breusch-Pagan-Godfrey</i>				
F-statistic	1.2420	Prob. F(5,38)		0.3089
Obs*R-squared	6.1804	Prob. Chi-Square(5)		0.2891

Source: Author's Computation (2015).

On the other side, gross capital formation (gcf), government spending on health (gsh) and income (inc) were found to have positive effect on poverty rate (POV) in Nigeria as these effects do not conform with a priori expectation. Correspondingly, a percentage increase in gross capital formation (gcf), government spending on health (gsh) and income (inc) enhance poverty rate in Nigeria by 8.9%, 31.0% and 0.25% correspondingly. The result shows that the estimated parameters of gross capital formation (gcf) and income (inc) were found to be partially and statistically significant at 5% critical level because their *p-values* are less than 0.05.

Thus, the F-statistic result indicated that all the incorporated income and macroeconomic variable indicators are simultaneously significant at 5% critical level. This prompts the rejection of the null hypothesis "income, investment and public spending have no significant impact on poverty rate in Nigeria". More so, the adjusted R-squared result reveals that 89.1% of the total variation in poverty rate (POV) is accounted by changes in government spending on education (gse), gross capital formation (gcf), government spending on health (gsh), income (inc) and revenue from oil proceeds (rop) during the review period. The Durbin-Watson test result reveals that there is presence of strong positive serial correlation among the residuals, because of the d-value (1.7743) is less than two.

However, the Breusch-Godfrey serial correlation test result from table 4.3 reported that we do reject the null hypothesis "no serial correlation" at 5% significance level, and likewise for the Breusch-Pagan-Godfrey heteroskedasticity test, the result indicated that we do not reject the null hypothesis "no hereroskedasticity" at 5% significance level.

The table also reports the probability value of the Jarque-Bera statistic (0.5797) shows that the estimated residual series is normally distributed with zero mean and constant variance. This tends to improve the reliability of the estimated parameters and thus, necessitate other residual diagnostic test such as higher order serial correlation and heteroskedasticity tests.

4.3 Granger Causality Analysis

The pair-wise Granger causality test results of the relationship among income, public spending, investment and poverty rate in Nigeria from 1970 to 2013 were presented on Table 4.4.

Table 4.4: Pair-Wise Granger Causality Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.
GCF does not Granger Cause POV POV does not Granger Cause GCF	42	3.97153 1.11015	0.0274 0.3402
GSE does not Granger Cause POV POV does not Granger Cause GSE	42	0.57757 0.92581	0.5662 0.4052
GSH does not Granger Cause POV POV does not Granger Cause GSH	42	0.59813 1.33024	0.5551 0.2768
INC does not Granger Cause POV POV does not Granger Cause INC	42	2.98023 0.61625	0.0631 0.5454
ROP does not Granger Cause POV POV does not Granger Cause ROP	42	0.40500 2.89020	0.6699 0.0682
GSE does not Granger Cause GCF GCF does not Granger Cause GSE	42	4.02381 0.98714	0.0262 0.3822
GSH does not Granger Cause GCF GCF does not Granger Cause GSH	42	3.76096 1.44115	0.0326 0.2496
INC does not Granger Cause GCF GCF does not Granger Cause INC	42	43.4202 42.8329	2.E-10 2.E-10
ROP does not Granger Cause GCF GCF does not Granger Cause ROP	42	26.3831 15.9437	8.E-08 1.E-05
GSH does not Granger Cause GSE GSE does not Granger Cause GSH	42	2.78810 6.35082	0.0745 0.0043
INC does not Granger Cause GSE GSE does not Granger Cause INC	42	1.98995 2.36216	0.1511 0.1083
ROP does not Granger Cause GSE GSE does not Granger Cause ROP	42	4.52052 2.66251	0.0175 0.0831
INC does not Granger Cause GSH GSH does not Granger Cause INC	42	2.71564 2.14271	0.0793 0.1317
ROP does not Granger Cause GSH GSH does not Granger Cause ROP	42	5.19164 2.12337	0.0103 0.1340
ROP does not Granger Cause INC INC does not Granger Cause ROP	42	17.2348 17.8360	5.E-06 4.E-06

Source: Author's computation (2015).

The test result indicated that on the basis of the F-statistic values, the null hypotheses that “each of gross capital formation (GCF) and income (INC) do not Granger cause poverty rate (POV)” were not rejected at 5% and 10% critical levels respectively. This implies that investment and income do Granger cause poverty rate in Nigeria. This denotes a uni-directional causation from investment and income to poverty rate. On the other way of causality, a uni-directional causation runs from poverty rate to revenue from oil proceeds at 10% significant level. Government spending on education (GSE) and Government spending on health (GSH) have no causal relation with poverty rate, and no feedback was also reported.

Other null hypothesis i.e. GSE does not Granger Cause GCF; GSH does not Granger Cause GCF; INC does not Granger Cause GSH; and ROP does not Granger Cause GSH were rejected at either 5% or 10% significant level, signifying a uni-directional causal relations. Additionally, these variables i.e. INC does not

Granger Cause GCF; ROP does not Granger Cause GCF; GSH does not Granger Cause GSE; ROP does not Granger Cause GSE; and ROP does not Granger Cause INC report a bi-directional causal relations at varying significant level.

V CONCLUSION AND POLICY OPTIONS

This study critically examined the precise impact of income growth, investment and public spending on poverty rate in Nigeria between 1970 and 2013. The Nigerian economy has undergone series of economic reforms during these time period. The study employed the Augmented Dickey Fuller test as pre-estimation test; ordinary least square (OLS) for estimation of parameters; and the Breusch-Godfrey serial correlation, Breusch-Pagan-Godfrey heteroskedasticity, and Jarque-Bera statistic as diagnostic tests and Granger causality test for causal relationship between the variables of interest.

The unit root test indicates that all the variables are stationary at order one $I(1)$ except revenue from oil proceeds which stationary at level i.e. $I(0)$. The cointegration test of all the variables reveals that there is long-run relationship among all the variables. Empirical result disclosed that government spending on education and revenue from oil proceeds exert negative effect on poverty rate in Nigeria during the reviewed period. It shows that oil proceeds being the main revenue source in Nigeria have greater impact in ensuring equal distribution of income as a means of reducing poverty level among her citizens. It further shows the high dependency of government on oil revenue as this serves as a medium through which eradication of poverty can be achieved (Adelowokan, 2015). Government spending on education also play a greater role in eradicating poverty level in Nigeria.

Nonetheless, income, investment, and government spending on health deteriorate the reduction in poverty level in Nigeria. This can be related to bad governance and high level of corruption in public offices which has ruined the country's resources. Therefore, there is need for good governance that promotes civil and economic liberties as they are essential for the development of citizenry initiatives and employment opportunities. More so, there is need for effective management of government spending in Nigeria as continuous increase in expenditure is needed to bring down the poverty rate.

Furthermore, the Granger causality test reports a bi-directional causal relation from income, government spending on education and health, investment, and revenue from oil proceeds to poverty rate. This however confirms the effective of income growth towards reducing the level of poverty in Nigeria. Thus, income growth was found to Granger cause poverty rate as there is no feedback reported. It is important to note that poverty rate Granger cause oil revenue as it indicates that if poverty rate is not tackled, revenue from oil proceeds may decline as insecurity will affect the activities of oil companies in the oil-producing regions (Adelowokan and Osoba A.M. (2015). The past crisis in the Niger-Delta has been a major obstacle to crude oil production over the past years.

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Appendix





