

**PUBLIC DEBT SUSTAINABILITY AND INCIDENCES OF POVERTY:
EMPIRICAL EVIDENCE FROM NIGERIA**

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ABSTRACT: *This paper examined the implications of public debt sustainability on poverty incidence in Nigeria. Specifically, the impacts of external debt stock and interest payment on external debt, proxy for external debt servicing on poverty headcount was estimated using Stock-Watson Dynamic Least Squares (DOLS). Data were extracted from the National Bureau of Statistics (NBS) and World Bank World Development Indicators. The Augmented Dickey-Fuller tests results show that the series are difference stationary as they are integrated of order one. The result of the Johansen-Juselius cointegration test reveals that the series have long run relationship. Thus, the null hypothesis of no cointegration is rejected at 5 percent level. The estimated cointegrating regression model shows that external debt stock as a share of GNI has significant positive relationship with poverty headcount as 10 percent increase in external debt stock induces 7.59 percent increase in poverty headcount. This is a pointer that policy intervention should focus on the effective management of the borrowed funds from external sources in order to drive the process of economic development. On the other hand, it was found that interest payments on external debt as a proportion of GNI is negatively related to poverty headcount. This is suggestive that the extent of debt servicing in Nigeria seems not to undermine the sustainable path of debt management and the developmental goal of poverty reduction. Accordingly, it is recommended for improved fiscal consolidation across various levels of government in Nigeria with a view to keeping the economy on the path of sustainability in terms of external debt management.*

KEYWORDS: Public Debt, Poverty Incidence, Sustainability, Debt Servicing

INTRODUCTION

For many years now, the sustainability of public debt has remained as an important discourse in macroeconomic environment. This could be attributed to the growing level of indebtedness across the globe as efforts are being made to adequately meet the current and future debt service obligations without resorting to debt relief, rescheduling or accumulation of areas. Oyedele, Emerah and Ogege (2013) argue that high level of indebtedness or increasing debt liabilities is a common scenario in developing economies considering the low level of domestic savings, high deficits in the current account, increasing levels of imports, especially capital goods and commitment to poverty alleviation. From the postulation of the neo-classical theory, especially the Harrod-Dornar growth model, it is believed that the rationale for borrowing in poor countries is the savings-investment gap. In response to the level and extent of indebtedness in poor countries, the International Monetary Fund (IMF) and the World Bank launched the highly indebted poor countries (HIPC) initiative which emphasizes on long term debt sustainability and reduction of poverty in the low income HIPC.

Arnone, Bandiera and Prestitiero (2008) observed that the HIPC initiative was intended to prevent the countries from accumulating huge foreign loans, provide opportunity for permanent

exit from debt dependence and support the poverty alleviation initiatives through adequate budgetary allocation. It is important to note that the adverse spillover effects of huge external loans on domestic investment and economic growth necessitated the design of the HIPC initiative. Ekpo and Udo (2013) identified debt overhang hypothesis and liquidity constraint effects as key channels through which huge debt accumulation translate to slower growth. As regards to the debt overhang hypothesis, Karagol (2002 as cited in Ekpo and Udo, 2013) argued that the expected debt service has the potential of being an increasing function of output level if the debt burden exceeds the repayment ability with some probability. On the other hand, the liquidity constraint effect is based on the fact that debt accumulation dampens growth as resources used for debt services crowd-out investment. In spite of the perceived growth-dampening effects of external debts, the extent of borrowing across various regions of the world, especially in low income countries continues to soar as showed in Figure 1.1.

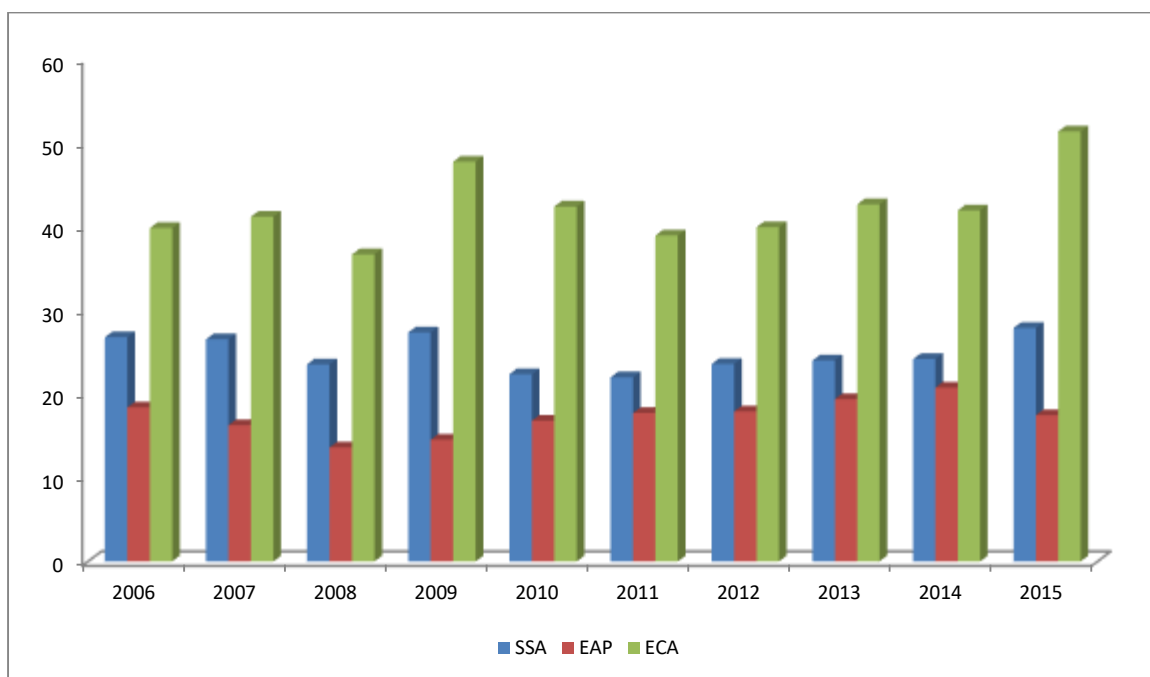


Figure 1.1: External debt stock as a share of gross national income (GNI) for sub-Saharan Africa (SSA), East Asia and Pacific (EAP), and Europe and Central Asia (ECA)

Source: World Bank Development Indicators (WDI, 2017).

Figure 1.1 shows the external debt stock as a share of GNI for three economic regions – sub-Saharan Africa (SSA), East Asia and Pacific (EAP); and Europe and Central Asia (ECA). It was observed that the external debt portfolio in ECA is highest compared to the other two regions. In 2006, the ECA accumulated 39.91 percent of external loan as a proportion of their GNI. The debt profile declined to 36.77% in 2008, but rise to all-time high of 51.41% in 2015. Similarly, the external debt stock in the SSA declined from 26.88% in 2006 to 23.62% in 2008, but reached a maximum value of 27.99% in 2015. As reported in Figure 1.1, the external debt stock for EAP varied between 2006 and 2015 with a minimum value of 12.45% in 2011 and a maximum value of 16.34% in 2015. This is an indication that countries in low income regions have been borrowing from the rest of the world to achieve certain targets with increasing challenge of debt sustainability.

In Nigeria, the issue of public debt sustainability has continued to generate concern among policy makers and other key players in the economy following the episode of high debt profile in recent years. Prior to late 1970s, the debt profile in Nigeria was not an issue to worry about as it was very much within the capacity of the country to service. However, the glut in the global oil market in addition to fiscal deficits and shocks in the external sector triggered the quest for foreign loan with a view to financing growth and development activities. Oyedele, Emerah and Ogege (2013) remarked that the Nigeria debt crisis actually began in 1978 when the country borrowed from the international capital market with high lending rate and limited tenure and grace periods.

Following the evolution of the debt crisis in 1978, the external debt stock in Nigeria has been rising with its associated consequences on macroeconomic outcomes and key indicators of socio-economic development. The external debt stock reached a record high of N298614.4 billion constituting 111.6 percent of the gross domestic product (GDP) in 1990 (Ekpo and Udo, 2013). However, the debt relief granted to Nigeria by the parish club in 2005 triggered a decline in the external debt stock. Beginning from 2009, the level of external debt in Nigeria remained upward trending as depicted in Figure 1.2.

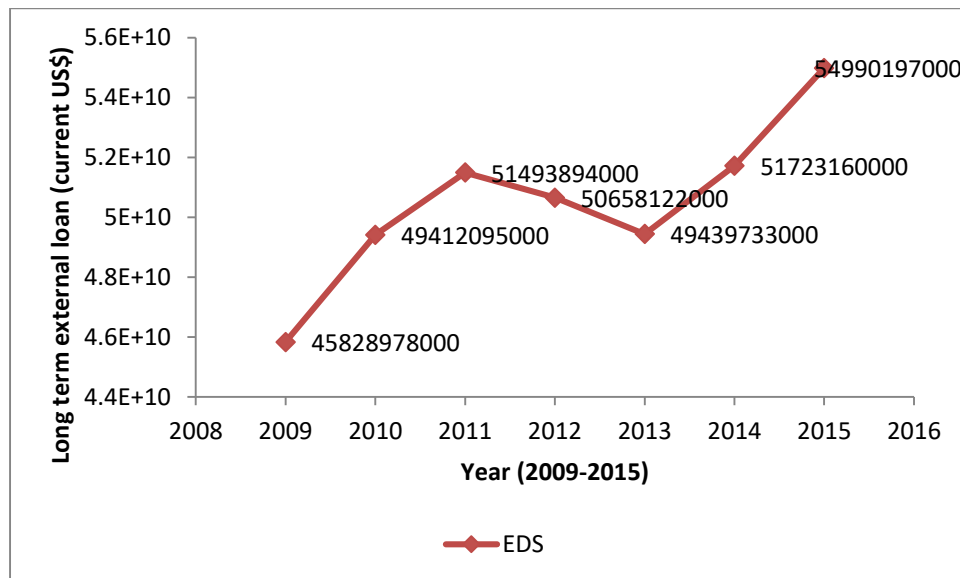


Figure 1.2: Long term external debt stock in Nigeria, 2009-2015

Source: World Bank WDI (2017)

From Figure 1.2, it was observed that the long term external debt stock increased from US\$45828978000 in 2009 to US\$51493894000 in 2011. It declined marginally to US\$49439733000 in 2013. This decline could be partly attributed to the boom in the global oil market which reduced the demand for external loan and potential debt servicing obligations. The Nigerian long term loan profile increased from US\$51723160000 in 2014 to a maximum value of US\$54990197000 in 2015.

The phenomenal increase in the Nigeria's external debt stock has raised concern on its sustainability in terms of servicing the loans through interest payment and repayments of the borrowed funds. Consequently, Nigeria has been faced with increasing external debts service obligations which imposes considerable pressure on the domestic economy and the

competitiveness of the economy in the global economy. For instance, huge resources have been committed to meeting the total external debt service obligation in Nigeria as showed in Figure 1.3

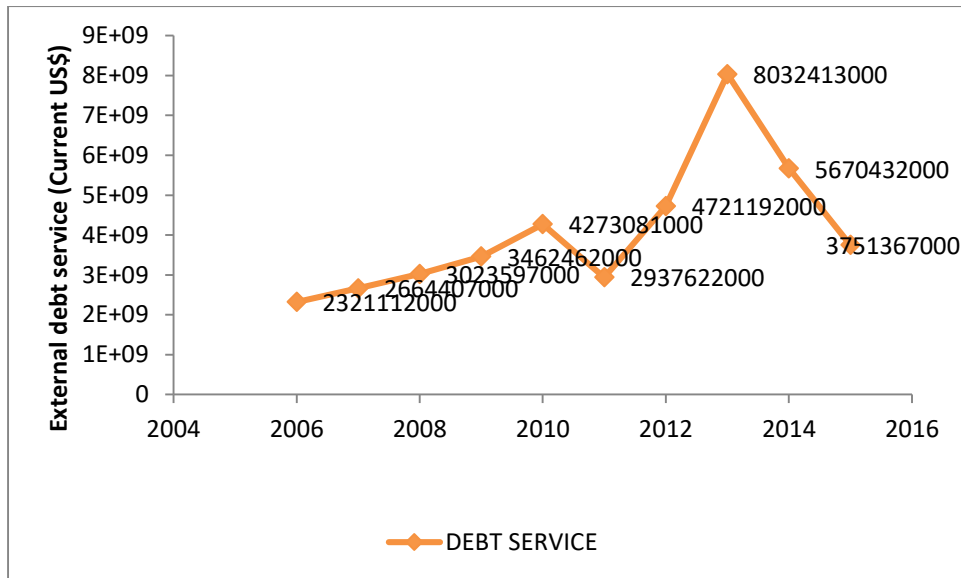


Figure 1.3: External debt service in Nigeria, 2006-2015.

Source: World Development Indicators

Figure 1.3 shows that the external debt serving in Nigeria has been upward trending except in 2011, 2014 and 2015 when it trended downward. On the average, Nigeria spent US\$408578500 in serving the external debt stock between 2006 and 2015. This is an indication that huge resources are earmarked for sustaining the external loan in Nigeria with associated implications on socio- economic development indicators. The debt service obligation reached an all-time high value of US\$8032413000 in 2013.

Following the increasing obligations of debt servicing to contain the increasing risk of external debt portfolio, there has been controversies on whether the debt profile or implications of debt servicing deteriorate the economic and social conditions in Nigeria. These have further increased the doubt on the usefulness of external debt in addressing the rising incidences of poverty and other indicators of economic backwardness, especially low productivity, negative growth rate and poor employment generation amongst others. Despite efforts to engender debt sustainability in Nigeria, the incidence of poverty as illustrated in Figure 1.4 has continued to deepen.

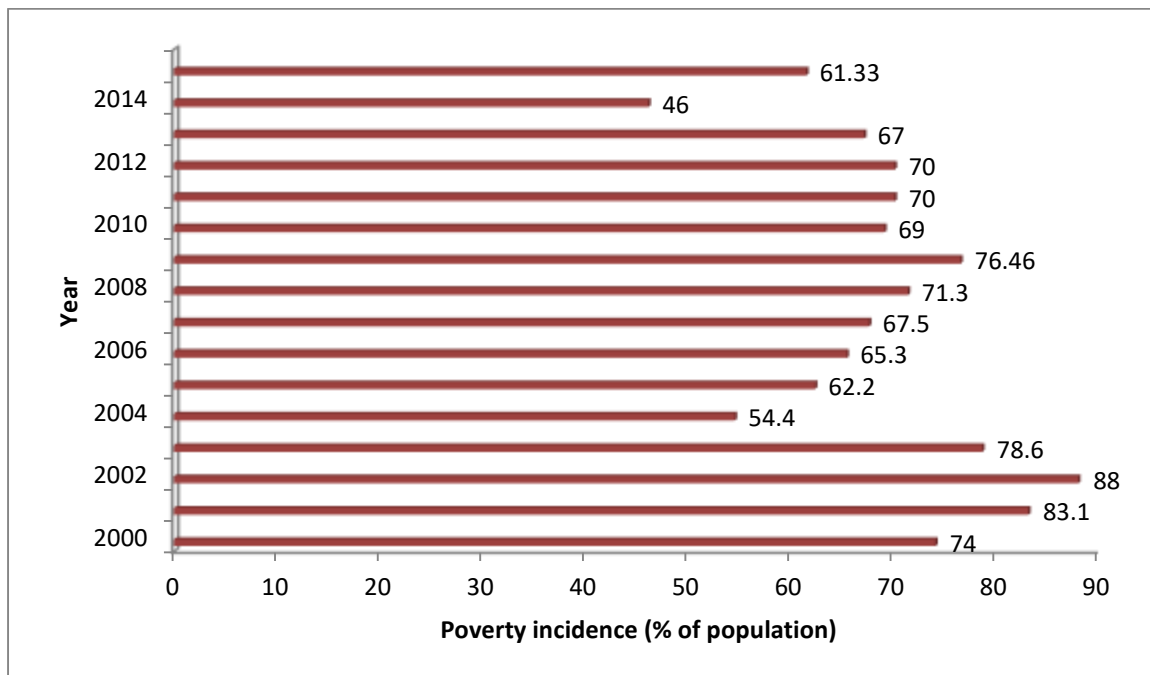


Figure 1.4: Poverty incidence in Nigeria, 2000-2015

Source: National Bureau of Statistics

As observed from Figure 1.4, the poverty incidences in Nigeria deepened between 2000 and 2015. On the average, 69.01 percent of the populations in Nigeria are in poverty. The plot also indicates that in each of the period except in 2014, over half the populations are poor. The poverty incidence climaxed in 2002 with 88 percent of the population living below the poverty threshold.

In view of the phenomenal increase in poverty incidence, there has been doubt from different quarters whether public debt accumulation and the efforts to manage the accumulated debts through interest payments provide opportunities for diversified and sustained growth and more importantly reduced poverty. It is against this backdrop that the sustainability of public debt in Nigeria with focus on the implications of external debt stock and debt service obligations on poverty incidence is examined.

LITERATURE REVIEW

Theoretical Underpinning

Classical Theory

The classical theory of public debt is closely associated with Adam Smith, Thomas Malthus, David Ricardo and J.B. Say amongst others. The assumptions of this theory are predominantly unfavorable to public borrowing as public expenditure is considered as being unproductive. This theory also believe in “laissez-faire” given that state interventions in the economy is assumed to be minimal and the government had to maintain only internal law and order, defend the country from external aggression, build diplomatic relations and look after some public works. The accumulation of debt by the public sector is therefore regarded as unnecessary

based on the assumption of the Classical School that resources are managed more wastefully in the public sector compared to the private one. The state indebtedness is further considered by the classical economists as a distortion to private capital which reduces its productivity, thus impair the growth and development of the economy.

Smith (1937) opposed the accumulation debt by the state, arguing that the indebtedness of the public sector obstructs the natural progress of a nation towards wealth and prosperity since, it allows for diversion of productive private resources by the state into unproductive expenditure. The perception of public debt by the classics is generally considered as pessimistic given that government borrowing, from the Classical viewpoint, is invariably wasteful. In response to the wasteful feature of public debt, Smith proposed balanced budgets, where all government expenditures are financed by taxation. He further explained that budget deficits can be justified only in emergencies, especially during outbreak of wars or natural disasters. In such circumstances, Smith argues that the method of financing public expenditures through either taxation or issue of public bonds is crucial for capital accumulation to stimulate growth (Tsoulfidis, 2007).

Keynesian Theory

This theory is fundamentally linked to the doctrine of Keynes (1936) and it is based on the assumption that state intervention in the economy is necessary due to the realities of market failure. The Keynesian doctrine alters the very liberal assumptions and principles of the Classical theory. In response to the challenges of those times, especially the great depression the Keynesian doctrine attaches great importance to the state, whose interventions in economy is considered helpful in complementing the activities of the free market and correcting its imperfections (Bilan, 2016). The Keynesians view of public debt deviated from the classical assumptions as they perceive public borrowing as growth-enhancing due the expected turnaround associated with its investment in productive activities.

More broadly, Keynesians are of the view that public borrowing tends offer opportunities for growth as government is more committed to more value adding activities including public works and assume the task of countering disturbing economic and social phenomena. This is believed to add value to borrowed funds as ways of intervention to correct imbalances and keep the economy on the path of growth. Keynes theory offered basis for state intervention in accelerating the pace of economic growth, in time of sluggish growth. Bernheim (1989) observed that many traditional Keynesians are of the view that public borrowings need not crowd out private investment as the increased aggregate demand enhances the profitability of private investments.

Conceptualization of Public Debt Sustainability

The sustainability of Public debt is concerned with the capacity of an indebted country to substantially meet its current and future debt service obligations without resorting to debt relief, rescheduling or accumulation of arrears. Mustapha and Prizzon (2015) opined that the sustainability of countries' debts is a function of how they use any new borrowing or other finance sources. They further explained that the use of loans to fund consumption and other non-productive activities tends to undermine the sustainability of future borrowing. The European Council (2011 as cited in Ekpo and Udo, 2013) describes debt as being sustainable when a debtor is expected to be able to continue servicing its debts without an unrealistically large correction to its income and expenditure.

A minimal debt share to GDP is an indication that the economy on the sustainable path of debt management and can produce sufficient output and generate enough income to sustain its debt burden by meeting the required debt obligations. Teica (2012) posits that the sustainability of public debt entails that accumulated public debt must be serviced at any time. Thus, meeting this obligation requires that governments must be solvent and liquid. Similarly, Wyplosz (2011) argues that the sustainability of public debt obligation depends on the extent of solvency and that both concepts are confronted with the problem of implementation. Sustainability of public debt can be disaggregated into short and long term sustainability. Short term sustainability requires that fiscal and budgetary policies must respond instantly to avoid excessive growth of indebtedness whereas long term sustainability is concerned with the sensitivity of fiscal policy measures to debt burden to contain its expansion over time.

Empirical Literature

Ekpo and Udo (2013) used econometric methodology to determine the link between debt burden, growth and incidence of poverty in Nigeria over the period 1970-2011. In the econometric model, elements of failing state comprising corruption, insecurity and ethnic violence were also included as explanatory variables. Again, the incidence of poverty was measured by the proportion of government spending on social services and income per capita. It was found that public debt is negatively related to growth and poverty reduction. The study however, suggested that expenditure on social services should be promoted.

Oyedele, Emerah and Ogege (2013) applied cointegration and regression analysis in investigating the impact of external debt and debt servicing on poverty reduction in Nigeria using time series data that spanned from 1980 to 2010. Specifically, the empirical analysis followed three procedures. First, the time series properties of the underlying variables were examined with the help of the Augmented Dickey-Fuller (ADF) unit root procedures. Second, the long-run relationship among poverty reduction, debt –Income ratio, debt-service, degree of openness, growth of agricultural value added, per capital income, inflation rate and investment-income ratio was examined using the Johansen and Juselius (1990) procedures. Lastly, a multiple regression analysis was undertaken to examine the impact of external debt and debt servicing on poverty reduction. From the results, it was found that both the external debt and debt servicing cause poverty in Nigeria. This finding suggests that government needs to mobilize domestic saving to adequately manage the external debt.

Akram (2016) assessed the implications of public debt on economic growth and poverty reduction in some selected South Asian countries comprising Bangladesh, India, Pakistan and Sri Lanka between 1975 and 2010. The study developed an empirical model that incorporates the role of public debt into growth equations and the model is extended to incorporate the effects of debt on poverty. The estimation process relied on the standard panel data-based estimation methodologies. The results indicate that public debt profile has a negative impact on economic growth. It was equally uncovered that neither public external debt nor external debt servicing has a significant relationship with income inequality. This is an indication that public external debt can be helpful or harmful for the poor as it is for the rich. On the other hand, domestic debt has a positive link with economic growth and a negative impact on the GINI coefficient, indicating that domestic debt is pro-poor.

Udoka and Anyingang (2010) examined the connection between external debt management policies and economic growth of Nigeria over the period 1970-2006. The Ordinary least square multiple regression technique was used to analyze data gathered for the period under review.

The result of the empirical analysis showed that, GDP, exchange rate, fiscal deficit, interbank rate, and terms of trade are the major determinants of external debt in Nigeria. It was therefore, recommended that the federal government should put in place well considered guideline for external debt management.

Adeyemi, Ijaiya and Raheem (2009) explored the determinants of poverty in Sub-Saharan Africa using a set of cross-country data drawn from 48 countries. The study adopted a multiple regression analysis for estimating the model. The regression estimates show that growth in population, rising price level and external debt servicing amongst others are the factors influencing the rate poverty in the sub-region. In view of the findings, the study recommended for debt forgiveness, stability in macroeconomic outcomes and good governance as measures for reducing the level and severity of poverty in the sub-region.

METHODOLOGY

Research Design

A quasi- experimental research design is employed in this study. This choice of the research approach was necessitated following the use of existing data.

Model Specification

This study employed a dynamic cointegrating regression model with poverty level as the dependent variable while external debt stocks and debt servicing, measured by interest payments on external debts as a share of gross national income (GNI) and exports of goods and services are included in the model as explanatory variables. The model is specified in the function form as:

$$POL = f(ESG, ESE, EDG, EDE) \quad (3.1)$$

The dynamic cointegrating regression model is expressed in its linear form as:

$$POL_t = y_0 + y_1 ESG_t + y_2 ESE_t + y_3 EDG_t + y_4 EDE_t + \sum_{k=-p}^m z_1 \Delta ESG_{t-p} + \sum_{k=-p}^m z_2 \Delta ESE_{t-p} + \sum_{k=-p}^m z_3 \Delta EDG_{t-p} + \sum_{k=-p}^m z_4 \Delta EDE_{t-p} + e_t \quad (3.2)$$

Where: POL = poverty incidence (Poverty headcount ratio), ESG = external debt stock as a share of GNI, ESE = external debt stock as a share of export and import of goods and services, EDG = external debt service payments as a share of GNI, EDE = external debt service payments as a share of export of goods and services, y_0 = constant term while $y_1 - y_4$ = long run regression estimates which measure the observed in poverty incidence, m and p = orders of lag and lead respectively, t and Δ = period covered and first difference sign, e_t = error term.

Data Collection Methods and Source

Time series data were used for the empirical analysis. The data collected spanned through the period of 1986 to 2016. The descriptions of the variables in the model and their various sources are presented in Table 3.1

Table 3.1 Description of variables in the model

Variable/Notation	Description	Source
Poverty incidence (POL)	Percentage of the population living below the poverty threshold of US\$1.9 per day	National Bureau of Statistics (2017)
External debt stock as a share of GNI (ESG)	Total external debt stocks to gross national income (%).	World Bank World Development Indicators (2017)
External debt stock as a share of exports of goods and services (ESE)	External debt stocks percentage of exports of goods, services and primary income	World Bank World Development Indicators (2017)
External debt service payments as a share of GNI (EDG)	Interest payment on external debt as a share of GNI	World Bank World Development Indicators (2017)
External debt service payments as a share of exports of goods and services (EDE)	Interest payment on external debt as a share of exports of goods, services and primary income	World Bank World Development Indicators (2017)

Source: Author's compilation, 2018

Method of Data Analysis

The Dynamic Least Squares (DOLS) technique developed by Stock and Watson (1993) was employed in the long run coefficients of the regressors. This was necessitated following the first difference stationarity properties of most macroeconomic time series. As a cointegrating regression estimator, the DOLS is selected for its capability to produce robust estimates in convenient form and its outstanding performance in previous studies using time series data. More importantly, the DOLS tends to produce optimal estimates of cointegrating regressions and corrects for endogeneity usually associated with regressors by including lags and leads of the difference explanatory variables. These unique properties of the DOLS are good for drawing inference from the coefficients of the explanatory variables included in the model. However, the estimation of the DOLS cointegrating model was preceded by some diagnostics tests.

Unit root test

The Augmented Dickey Fuller (ADF) procedure for unit root test was applied to determine the time series characteristics of each of the series. In this regard, the null hypothesis of unit root was tested against the alternative hypothesis of no unit root at 95 percent confidence interval. The computation of the t-statistic for each of the series was done at 5 percent level. The model for the unit root test is specified in general form as as:

$$\Delta Z_t = \mathcal{U}_0 + \mathcal{U}_1 Z_{t-1} + \sum_{i=1}^q \mathcal{M}_i \Delta Z_{t-i} + e_t \quad (3.3)$$

Where: Z = vector of the series in the model, \mathcal{U}_1 and \mathcal{M}_i = estimated coefficients, q = order of lag, Δ , e_t and t are the first difference notation, error term and period under review respectively.

Cointegration test

This cointegration test is used to determine whether or not long run equilibrium relationship exists among the variables. Specifically, the cointegration test for multivariate model developed by Johansen and Juselius (1990) and applied in numerous studies (Dueker and Startz, 1998; Cushman, Lee and Thorgeirsson, 1996; Morin, 2006; Bahmani-Oskooee and Economidou, 2005; Pfaff, Zivot, Stigler, and Pfaff, 2016 and more) was used to test the null hypothesis of no cointegration against the alternative hypothesis of cointegration at 5 percent level. The decision on whether the series are cointegrated is based on the Trace and Max-Eigen statistics.

FINDINGS AND DISCUSSION

Descriptive Statistics

The average value of each of the variables over the study period and are components of the descriptive statistics are summarized in Table 4.1.

Table 4.1: Descriptive statistics of the series

Series	Sample	Mean	Std. Dev.	Min	Max	Jarque-Bera	P-value
POL	37	57.678	15.042	28.6	88	1.418	0.492
ESG	37	67.065	59.701	4.131	228.372	4.019	0.134
ESE	37	154.05	122.83	14.528	412.074	2.942	0.229
EDG	37	2.822	2.795	0.019	8.351	4.252	0.119
EDE	37	6.418	6.137	0.081	20.859	3.725	0.155

Source: Author's computation from the sample data

Table 4.1 reports the descriptive statistics. A cursory look at the results shows that the 57.68 percent of the Nigerian population are poor. This shows that the incidence of poverty in the country is very disturbing as over 50 percent of the Nigerian population lives below the poverty line. It was also found that the external debt stocks are percentage of GNI, and exports and imports averaged 67.07 percent and 154.05 percent respectively. Additionally, the interest payments on external debt as shares of GNI and exports and imports averaged 2.82 percent and 6.42 percent respectively during 1980-2016. The results further indicate that the series clustered around their respective mean values given that their standard deviations are less than their associated mean values. The probability values of the Jarque-Bera statistics reported in the last column of Table 4.1 reveal that series normally distributed at 5 percent level.

Unitary Test

In compliance with the econometrics requirement for time series modelling, the unit root test was conducted and the results are reported in Table 4.2.

Table 4.2: ADF unit root test results

Variable	Levels test results		1 st diff. test results		Order of integration
	t-statistic	SIC Lag order	t-statistic	SIC Lag order	
POL	-1.859 (0.655)	0	-6.221 (0.000)	0	I (1)
ESG	-2.3782 (0.384)	0	-5.770 (0.000)	0	I (1)
ESE	-2.875 (0.182)	0	-4.633 (0.004)	1	I (1)
EDG	-3.122 (0.117)	0	-6.973 (0.000)	0	I (1)
EDE	-3.428 (0.064)	0	-5.157 (0.001)	1	I(1)

Source: Author's computation from E-views software

Note: Figures in parenthesis are the MacKinnon (1996) one-sided p-values, SIC denotes Schwarz information criterion

The ADF unit root test results in Table 4.2 show that none of the variables is stationary at levels. Thus, the null hypothesis of unit root cannot be rejected at 5 percent level. This finding necessitated the differencing of the series and the results show that all the variables are stationary at first difference. In other words, the variables are found to be integrated of order one [I(1)]. Hence, they were subjected to cointegration test to determine if they are cointegrated.

Cointegration Test

The Johansen and Juselius (1990) method formed basis for determining if the linear combination of the series can lead to cointegration. The results are reported in Table 4.3.

Table 4.3: Cointegration test result

Series: POL ESG ESE EDG EDE				
Lags interval (in first differences): 1 to 2				
Hypothesized No. of CE(s)	Trace test result		Max-Eigen test result	
	Trace Statistic	0.05 Critical Value	Max-Eigen Statistic	0.05 Critical Value
None *	142.409	88.804	69.099	38.331
At most 1 *	73.310	63.876	35.790	32.118
At most 2	37.519	42.915	22.071	25.823
At most 3	15.448	25.872	8.9061	19.387
At most 4	6.542	12.518	6.5421	12.518

Source: Author's computation from E-views software

* denotes rejection of the hypothesis at the 0.05 level

Table 4.3 shows the multivariate cointegration test results for the series. It was found from the Trace and maximum Eigenvalue statistics that the model has two cointegrating equations at 5 percent level. This is an indication that the linear combination of the series leads to long run relationship among them. In view of this finding, the extent and direction of the relationship between poverty incidence and the underlying explanatory variables was estimated via cointegrating regression model.

Cointegrating Regression Model

The DOLS was applied in estimating the cointegrating regression model. The results are reported in Table 4.4

Table 4.4: Summary of the cointegrating regression result

Dependent Variable: POL				
Method: Dynamic Least Squares (DOLS)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ESG	0.759	0.337	2.250	0.038
ESE	-0.233	0.143	-1.625	0.122
EDG	-25.719	10.016	-2.568	0.020
EDE	7.414	4.200	1.765	0.096
C	69.314	2.537	27.319	0.000
R-squared	0.875	Mean dependent var		59.276
Adjusted R-squared	0.758	S.D. dependent var		14.092
S.E. of regression	6.937	Sum squared resid		817.99
Long-run variance	56.832			
Wald test result				
Test statistic	Value	Degree of Freedom	Probability value	
F-statistic	15.177	(4, 17)	0.000	

Source: Author's computation from E-views software

The result in Table 4.1 shows that external debt stock as a share of GNI has significant positive relationship with poverty headcount. 10 percent increase in external debt stock induces 7.59 percent increase in poverty headcount. This finding coincides with the result of Oyedele, Emerah and Ogege (2013) that external debt cause poverty in Nigeria. This is a pointer that policy intervention should focus on the effective management of the borrowed funds in order to drive the process of economic development. On the other hand, it was that interest payments on external debt as a proportion of GNI is negatively related to poverty headcount. This is suggestive that the extent of debt servicing in Nigeria seems to be minimal to undermine the sustainable path of debt management and the developmental goal of poverty reduction. The F-statistic (15.177) with probability value of 0.000 indicates that both the stock and interest payments on external debt are collectively important predicting changes in poverty headcount in the long run. The coefficient of determination (0.875) shows that 87.5 percent changes in poverty headcount are explained by variations in external debt stock and interest payments on external borrowings. This suggests that the estimated model is a good fit.

Autocorrelation Test Result

The correlogram Q-statistics formed basis for the autocorrelation test. The results are reported in Table 4.5.

Table 4.5 Summary of autocorrelation test result

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. * .	. * .	1	-0.082	-0.082	0.2512	0.616
. .	. .	2	-0.058	-0.065	0.3780	0.828
. .	. .	3	-0.023	-0.034	0.3990	0.940
. * .	. * .	4	-0.070	-0.080	0.5980	0.963
. .	. .	5	0.056	0.040	0.7301	0.981

Source: Author's computation from E-views software

It was evidence from the result that the Q -statistics are insignificant at all lags given that their corresponding probability values exceed 0.05. This indicates insignificant serial correlation in the residuals at 5 percent level. Hence, the model is free serial correlation and can be relied upon for prediction with high level of precision.

Forecast Estimated model

The plot of the forecast for poverty headcount during 1980-2016 at plus and minus 2 standard error band is reported in Figure 4.1.

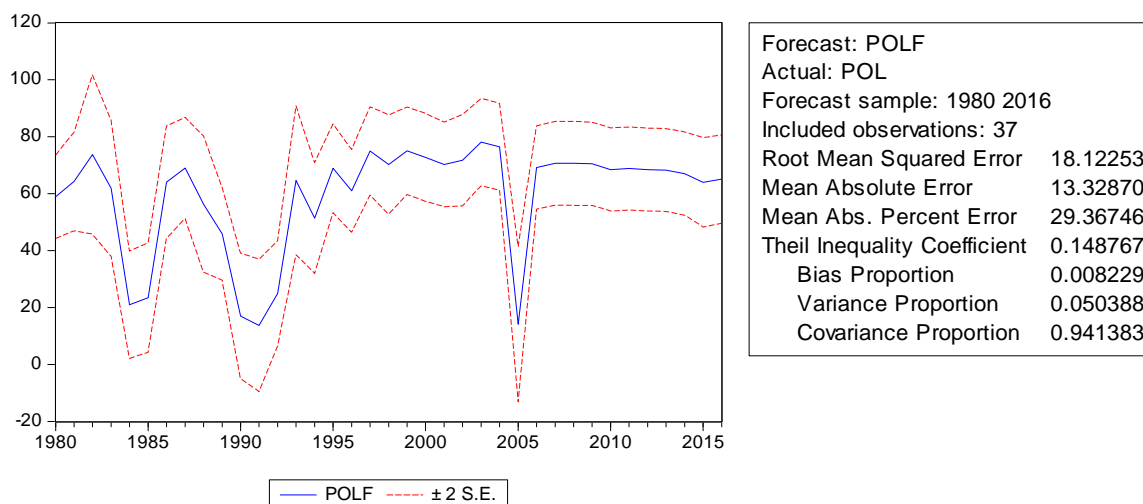


Figure 4.1: Plot of the Forecast test

Source: Author's computation from E-views software

Figure 4.1 shows the forecast test for the estimated poverty model. The Theil inequality coefficient (0.149) shows that the model is stable and can be relied upon for long term prediction. This finding is supported by the plot which showed that the trend is tracked reasonably well as no point is located outside the forecast interval or the two critical lines.

CONCLUSION

External debt sustainability has remained one of the most advocated practices in developing economies including Nigeria in view of their increasing debt profiles and poor fiscal consolidation efforts. This study, therefore, estimated the relationship between public debt

sustainability and poverty incidence in Nigeria. Emphasis was placed on the implications of external debt stock and debt service obligations on poverty headcount. The result shows that external stock increased the poverty incidence whereas debt servicing has significant negative impact on poverty level. The findings suggest that increasing borrowing from external sources has emerged as de-enabler of economic development due to associated increase in poverty incidence. Interestingly, it is also drawn from the findings that Nigeria demonstrates considerable level of liquidity and solvency with regard to meeting the external debt servicing obligations, thus, advancing on the path of debt sustainability without significant distortions in macroeconomic outcomes. Accordingly, it is recommended for improved fiscal consolidation across various levels of government in Nigeria in order to keep the economy on the path of sustainability in terms of external debt management.

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