

# Impact of External Debt on Economic Growth in Nigeria: An ARDL Bound Testing Approach

Mbah Stella Ada\* Agu Osmond Chigozie Umunna Godwin  
Department of Economics and Development Studies, Federal University Oye- Ekiti

## Abstract

In order to achieve the ultimate goal of sustainable economic growth, governments require substantial amount of capital finance through investment expenditures on infrastructural and productive capacity development. Due to the unavailability of adequate capital because of low savings, most developing nations therefore resort to borrowing from external sources to bridge the resource gap. Nigeria external debt profile has increased over the years with the aim of achieving economic growth but this has culminated to low economic performance as evidenced in her high unemployment and poverty rate and low standard of living. This has informed the need to embark on the present study with a view to investigating the impact of external debt on economic growth in Nigeria. Using the ARDL bound testing approach to cointegration and error correction models for the period 1970 – 2013; in order to investigate the existence of long-run equilibrium relationship among the variables. In addition, the Granger causality test was also used to check for the direction of causality among the variables. The result of this study indicates a long-run relationship among the variables. External debt impacts negatively significant on output. The finding also established a unidirectional causality between external debt and economic growth. Consequently, the study recommends, government should embark on prudent borrowing and encourage export-oriented growth.

**Keywords:** External debt, economic growth, bound testing, cointegration

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In order to achieve the ultimate goal of sustainable economic growth, governments require substantial amount of capital finance through investment expenditures on infrastructural and productive capacity development. Due to the unavailability of adequate capital because of low savings, most developing nations therefore resort to borrowing from external sources to bridge the resource gap. Nigeria external debt profile has increased over the years with the aim of achieving economic growth but this has culminated to low economic performance as evidenced in her high unemployment and poverty rate and low standard of living. This has informed the need to embark on the present study with a view to investigating the impact of external debt on economic growth in Nigeria. Using the ARDL bound testing approach to cointegration and error correction models for the period 1970 – 2013; in order to investigate the existence of long-run equilibrium relationship among the variables. In addition, the Granger causality test was also used to check for the direction of causality among the variables. The result of this study indicates a long-run relationship among the variables. External debt impacts negatively significant on output. The finding also established a unidirectional causality between external debt and economic growth. Consequently, the study recommends, government should embark on prudent borrowing and encourage export-oriented growth.

## 1. Introduction

One of the key macroeconomic objectives of a nation is the achievement of sustainable economic growth. To achieve this goal, every Government requires a substantial amount of capital finance through investment expenditures on infrastructural and productive capacity development (Umaru et al, 2013). Consequently, this facilitates the growth of their gross domestic product (GDP), which if persistent should culminate in economic development, a status vigorously pursued by all less developed countries (LDCs), Nigeria inclusive. However, Ayadi & Ayadi (2008) note that the amount of capital available in most developing countries treasury is grossly inadequate to meet their economic growth needs mainly due to their low productivity, low savings and high consumption pattern. Governments therefore resort to borrowing from outside the country to bridge the resource gap.

Countries borrow to promote economic growth and development, by creating conducive environment for people to invest in various sectors of their economies (Umaru et al, 2013). Similarly, Obudah and Tombofa (2013) argue that the specific reasons why countries may borrow include: to be able to finance their reoccurring budget deficit, as a means of deepening their financial markets, to enable them fund the increasing government expenditures, to enhance their narrow revenue sources and low output productivity which results in poor economic growth. According to Dual-gap theory, (Chenery, 1996) governments borrow to augment their limited resources so as to bridge the savings-investment gap.

The Keynesian economics school of thought posits that government borrowing can be used to promote economic growth, through the financing of government deficit expenditures which stimulates aggregate demand

and thus encourage increase in private investments. However excessive public debt can create great debt burden for the country. Soludo (2003) cited in Okonjo- Iweala et al (2013) argues that once an initial stock of debt grows to a certain threshold, servicing them becomes a burden, and countries find themselves on the wrong side of the Debt Laffer Curve, with debt crowding out investment and growth. Conversely, Bakare (2011) asserts that a country's indebtedness does not necessarily slow growth, rather it is the nation's inability to optimally utilize these loans to foster economic growth and development and ensure effective servicing of such debt that hampers the benefits derivable from borrowed capital resources

Debt, arguably, remains one of the major economic challenges facing governments in low income countries due to their persistence budget deficit and this has continued to attract the attention of international financial institutions and bilateral lenders. Udeh (2013) notes that this has brought about the adoption of several initiatives capable of alleviating the debt burden which continues to hinder the growth prospects of most highly indebted poor countries (HIPC) economies. These initiatives range from debt rescheduling to outright cancellation.

Nigeria's external debt can be traced back to the pre independence period, though the debt level was minimal until 1978, when the first Jumbo loan of more than \$1.0 billion was raised from the International Capital Market (ICM)[ Debt management office (DMO, 2004)]. However, from 1977, the debt stock incurred by the country has been on a steady increase, rising from \$0.763 billion in 1977 to \$5.09 billion in 1978 and \$8.65 billion in 1980, an increase of over 73.96 percent (DMO, 2004). This subsequently rose to \$35.94 billion in 2004. Following the debt relief in 2006 Nigeria was advantaged to offset substantial part of its debt but this later started to record an upward trend. According to World Bank report, Nigeria's total debt stock as at December 2014 stood at N12.4 Trillion.

Despite the huge amount of debts which the country has continued to incur over the years, with the aim of achieving economic growth and development, high unemployment, poverty, and low standard of living is still prevalent in the country, as observed by Aiyedogbon and Ohwojasa (2012) and Nwagwu (2014). The inability of Nigeria to effectively meet her debt obligations has adverse effect on the economy, as interests arrears accumulate over the years, thereby creating a much greater debt burden on the nation resulting in a greater percent of her revenue being spent on debt service arrears. Audu (2004) submits that the debt service burden has continued to hamper Nigeria's rapid economic development and worsened the social problems; this is because debt servicing crowds out investment and growth. Furthermore, Pattilo et al (2002) asserts that at low levels, debt has positive effects on growth but above the threshold point accumulated debt begins to have a negative impact on growth. This therefore has informed the need to embark on the present study with a view to empirically analyse the impact of external debt on economic growth rate (as measured by GDP growth rate) of Nigeria.

The remaining part of the study is organized as follows: section two provides a synthesis on theoretical and empirical literature on external debt and economic growth. Section three discusses the source and methodology employed in the study. Section four deals on the presentation and discussion of the result and this was concluded in section 5.

## **2. Literature Review**

### **2.1 Theoretical Literature**

There are several contributions by various economists and schools of thoughts as regards the subject matter of debt and economic growth. These concepts are relevant to this study as they serve as dependable framework upon which this study is built and as such some of them are discussed which includes: The dual gap theory, the debt overhang theory, Debt Laffer curve and crowding out hypothesis theory.

The dual gap theory of Chenery (1996) postulates that economic growth depends on investment and that investment is a function of savings. Less developed nations do not have sufficient savings (due to low per capita income) to match up with the necessary investment to ensure economic growth, they therefore resort to external finance to fill the savings investment gap. The dual gap theory is deduced from a national income accounting identity which postulates that excess investment expenditure (savings-Investment gap) is equivalent to the surplus of imports over exports ( foreign exchange gap) (Mbah and Amassoma, 2014). However, Ayadi & Ayadi (2008) argue that acquisition of external funds depends on the relationship between domestic savings, foreign funds, investment, and economic growth. Following Ajayi (2000), the guiding principle is to seek for external finance when funds acquired generates a rate of return that is higher than the cost of borrowing the foreign funds. Adhering to this principle therefore implies that such country is increasing capacity and expanding output with the aid of foreign savings.

Fajana (1993) argues that incurring external debt is not really bad, but the problem arises from mismanagement of such funds. In his view, borrowing is unavoidable because external borrowing is a first order condition for bridging the domestic gap; while the second order condition is that such funds should be invested in viable projects whose rate of return is higher than that of the interest rate on the loan. Furthermore, he asserts

that external debt has to be properly managed to serve as an engine for growth and the resources it yields should be prudently and efficiently utilized.

The debt overhang theory of Krugman (1988), posits that huge borrowing leads to high indebtedness, debt traps and slows down economic growth. According to him, accumulated debt stock results in higher tax (tax disincentive) on future output and thus crowds out private investment. This means that due to large debt stock, potential investors would be discouraged on the expectation that government may finance its debt service obligation by imposing high taxes and this would further retard the growth of the nation. The importance of the debt overhang theory more or less cannot be over emphasized. According to Audu (2004) cited in Ayadi & Ayadi (2008) "the debt service burden has militated against Nigerian's rapid economic development and worsened the social problem. Service delivery by key institutions designed to mitigate the living conditions of vulnerable groups were hampered by decaying infrastructure due to poor funding. By cutting down expenditure on social and economic infrastructure, the government appears to have also constrained private sector investment and growth through lost externalities. This has reduced total investment, since public investment is a significant proportion of the total investment in the country."

The Debt Laffer curve emphasizes the relationship between the amount of debt repayment and the size of the debt. When the effect is so strong, the debtor is said to be on the wrong side of the Laffer curve, the idea of the Laffer curve also implies that there is a limit to which debt incurred can stimulate growth (Elbadawi et al, 1996) cited in (Ademola et al, 2013). When the debt exceeds the threshold point, it becomes a burden as the cost of servicing the debt brings strain to the amount of resources available for productive investments, thereby crowding out investment which ultimately retards growth. This therefore implies that a reduction in the current debt service should lead to an increase in current investment for any given level of future indebtedness (Cohen 1993). Economic literature, posits that debt will impact positively on an economy up to a threshold point, beyond which any further increase in debt will bring about a negative impact on the economy (Kabadayi, 2012)..

## 2.2 Empirical Evidences

In a comparative study conducted by Ayadi and Ayadi (2008) on the impact of external debt on economic growth of Nigeria and South African using both Ordinary Least Square (OLS) and Generalized Least Square (GLS), they found evidence for a negative relationship between external debt and economic growth in both countries. However, South Africa is better than Nigeria in managing her debt service. In addition, external debt contributes positively to growth up to a point after which its contribution becomes negative in Nigeria (reflecting the presence of non-linearity effects).

Adesola (2009) examine the relationship between debt servicing and economic growth in Nigeria, using the ordinary least square multiple regression approach. His result showed that debt payments to the London club creditors, Paris club creditors, Promissory notes holders and other creditors have significant impact on the GDP and GFCF (Gross Fixed Capital Formation), while debt payments to Paris club and debt payment to Promissory notes holders are positively related to GFCF and GDP, the debt payments to London club creditors and other creditors revealed a negative effect on GFCF and GDP for the period of 1981-2004.

Akram (2010) in the study of the impact of public debt on economic growth and investment in Pakistan developed a hybrid model that explicitly incorporates the role of public debt in growth equations. He adopted the Autoregressive distributed lag (ARDL) technique in estimating the model and the result revealed that both domestic and external debt have negative relationship with per capita GDP and investment, confirming the existence of "Debt overhang effect" which crowds out private investment.

Safdari and Mehiri (2011) investigated the effect of external debt on economic growth in Iran for the period of 1974-2007, by observing the balance and long term relation of five variables: GDP, Private investment, Public Investment, external debt and Imports. They employed the Vector autoregressive model (VAR) in their econometric analysis and the result of the research showed that external debt and imports had a negative effect on gross domestic product, but variables of private and public investments had positive effects on economic growth.

In a related study conducted by Amassoma (2011) investigating the causal nexus between external debt, internal debt, and economic growth in Nigeria, employed the Granger causality test in determining the direction of causality of the variables. He found that there exist a bi-directional causal relationship between internal debt and economic growth, while external debt and economic growth have a unidirectional causal relationship suggesting that economic growth causes external debt in Nigeria.

Kabadayi et al, (2012) determine the impact of external debt on economic growth in 19 Transitional economies adopting the panel autoregressive distributed lag (ARDL) model. It was found that external debt has positive impact on economic growth, also openness of the economy has a positive impact in the long run, while external debt to export ratio has a negative impact on growth rate of the transitional economies in the short run.

Egbetunde (2012) in his study of causal relations tested for the stationary properties of variables and found them stationary at first difference, the result of the co-integration test showed the presence of long run

relationship between Public debt and economic growth in Nigeria. The result of the study revealed that there exist a bi-directional relationship between public debt and economic growth, implying that improvement in economic activities call for borrowing to enhance on-going development processes in the economy, and borrowing also promotes growth in Nigeria. Similarly Rahman et al (2012) in their study of relationship between external debt and gross domestic product in Bangladesh used annual time series data to avoid seasonal biases, the ADF and Phillips-Perron test were carried out to ascertain the stationary properties of the variables, Granger causality and co-integration models were also employed to determine the Long run relationship as well as the direction of causality that exists between the variables, they found that there exist a bi-directional causal relationship between GDP and external debt.

Sulaiman and Azeez (2012) investigated the impact of external debt on economic growth in Nigeria using GDP as the dependent variable while ratio of external debt to export, inflation and exchange rate were used as the independent variables. Annual time series data covering the period of 1970 to 2010 were used, which were analyzed using the ordinary least square technique, ADF, unit root test, Johansen co-integration test and Error correction model (ECM). Results from the study showed that external debt has a positive impact on the Nigerian economy in the long run. They therefore recommended that external borrowing should be obtained for economic growth reasons rather than social and political motives.

Barik (2012) researched on the indirect relationship between government debt and economic growth in India for the period of 1981-2011. He conducted an econometric analysis with an augmented Solow (1956) Neoclassical growth model, and found that there exists an indirect relationship between public debt and economic growth in India. The result of the study reveals that public debt appears to be positively related to both investment and output growth and thereby has an indirect impact on economic growth through its positive effect on investment.

In the empirical research by Ishola et al (2013), on the effect of external debt on sustainable economic growth in Nigeria for the period of 1980-2010, using the ordinary least Square regression method, the study found that a 12.3 percent change in economic growth is as a result of external debt and prime lending rate in Nigeria. It therefore recommends that the government should through an act of its political will address the fundamental causes of external debt and also ensure adequate utilization of borrowed funds to develop the different sectors of the economy so as to enhance the economic growth of the nation.

From the foregoing it is evident that the literature on external debt and economic growth is replete with its divergent results. While Kabadayi et al, (2011), Sulaiman and Azeez (2012), Barik (2012) found evidence for a positive relationship between external debt and growth, Ayadi and Ayadi (2008), Akram (2010), Safdari and Mehirizi (2011) found evidence for a negative relationship. Similarly, Egbetunde (2012) and Rahman et al (2012), found that there exists bi-directional relationship between external debt and economic growth, Amassoma (2011) found a unidirectional causal relationship between external debt and economic growth. The divergence observed in these results suggests differences in theoretical and methodological approaches. The nature of the relationship between external debt and economic growth is more contentious in empirical than theoretical in the Nigerian context and therefore is subject to further empirical investigation. Such enquiry is what this study is set to achieve and to find out if this study will corroborate any of the above outcomes.

### 3. Data and Methodology

#### 3.1 Data

All data used for this study are collected from Central Bank of Nigeria (CBN) Statistical Bulletin and World Bank Data Base. It is a times series data which span the time period 1970-2013.

#### 3.2 Methodology

To fully investigate the impact of external debt on economic growth in Nigeria an open macroeconomic model is specified following (Chongo, 2013), however with some little modifications. The study argued that a framework linking the various sectors of the economy was needed to be able to fully analyze the effect of Public debt on economic growth. As such, a national income identity model augmented with debt and monetary variables were employed. The model explores the linear relationship between output growth and debt burden indicators and is stated thus

$$GDPGR_t = \beta_0 + \beta_1 EDS/GDP_t + \beta_2 DSS/GDP_t + \beta_3 NEXP/GDP_t + \beta_4 EXCH_t + \beta_5 TRD_t + \mu_t \dots \dots \dots (1)$$

Where

- GDPGR = annual growth rate of real GDP
- EDS/GDP = ratio of external debt to GDP
- DSS/GDP = ratio of debt service stock to GDP
- NEXP/GDP = ratio of national expenditure to GDP
- EXCH = real exchange rate

TRD = trade openness

EDS/GDP and DSS/GDP are the two debt burden indicators used in this study. By implication, the higher a country's EDS/GDP and DSS/GDP, the greater the debt burden on the economy (Omotoye et al., 2006). National expenditure refers to the summation of private consumption, government consumption expenditure, and gross capital formation which is a form of investment. This variable has been proven to impact positively on the economic growth of countries. Macroeconomic variables such as exchange rate and trade openness which measures how an economy is open to international trade were also captured in the model. The apriori expectations for EXCH and TRD are positive relationships.

This study adopts the ARDL bound testing approach developed by Pesaran and Shin (1995, 1999) to estimate the long run equilibrium and to establish the direction of causation between variables. This methodology became necessary because the variables were identified to be integrated of I(0) and I(1) and the model is a single equation. The advantages of using this approach instead of the conventional Johansen (1998) and Johansen and Juselius (1990) approach is that while the conventional cointegration method estimates the long-run relationships within a context of a system of equations, the ARDL method employs only a single reduced form equation (Pesaran & Shin, 1995). In addition, different optimal lags can be used for the different variables, which is not applicable in the standard cointegration test.

To make use of this method, a unit root test (with or without trend) will first be conducted using the augmented Dickey Fuller test or Phillip Peron to ascertain the level of stationarity of the variables which must be a combination of I(0) and I(1) series. Following Pesaran et al (2001), the ARDL approach to cointegration involves estimating the unrestricted error correction (EC) model thus

$$\begin{aligned} \Delta GDPGR_t = & \beta_0 + \beta_1 \Delta EDS/GDP + \beta_2 \Delta DSS/GDP + \beta_3 \Delta NEXP/GDP + \beta_4 \Delta EXCH \\ & + \beta_5 \Delta TRD + \beta_6 (GDPGR)_{t-1} + \beta_7 \Delta (EDS/GDP)_{t-1} + \beta_8 \Delta (DSS/GDP)_{t-1} \\ & + \beta_9 \Delta (NEXP/GDP)_{t-1} + \beta_{10} \Delta (EXCH)_{t-1} + \beta_{11} \Delta (TRD)_{t-1} \\ & + ECT_{t-1} \dots \dots \dots (2) \end{aligned}$$

Lag length test is conducted by estimating single equation VAR and using the lag length criteria to obtain the optimal number of lags for each variable. This is followed by the estimation of a single equation unrestricted error correction model with the number of selected lags as shown in equation 3.

$$\begin{aligned} \Delta GDPGR_t = & \beta_0 + \sum_{i=1}^p \beta_1 \Delta (GDPGR)_{t-i} + \sum_{i=0}^p \beta_2 \Delta (EDS/GDP)_{t-i} + \sum_{i=0}^p \beta_3 \Delta (DSS/GDP)_{t-i} \\ & + \sum_{i=0}^p \beta_4 \Delta (NEXP/GDP)_{t-i} + \sum_{i=0}^p \beta_5 \Delta (EXCH)_{t-i} + \sum_{i=0}^p \beta_6 \Delta (TRD)_{t-i} \\ & + \beta_7 (GDPGR)_{t-1} + \beta_8 (EDS/GDP)_{t-1} + \beta_9 (DSS/GDP)_{t-1} \\ & + \beta_{10} (NEXP/GDP)_{t-1} + \beta_{11} (EXCH)_{t-1} + \beta_{12} (TRD)_{t-1} + v_t \dots \dots \dots (3) \end{aligned}$$

Where  $\Delta$  is first difference operator,  $p$  is the optimal lag length and all other variables remain the same. The F statistics is obtained by conducting Wald test on the coefficient of unrestricted ECT variables. The F statistics is used for testing the existence of long run relationship and will be compared with Pesaran critical value at 5% level of significance. When the F statistics is above the upper bound value, we reject the null hypotheses of no cointegration among variables, if it falls below the lower bound value we do not reject the null hypotheses of no cointegration and if it lies between the bounds, the result is inconclusive.

If there is evidence of a long-run relationship (cointegration) of the variables, the short-run dynamics can be derived by estimating the ECT with the specified lags thus:

$$\begin{aligned} \Delta GDPGR_t = & \beta_0 + \sum_{i=1}^p \beta_1 \Delta (GDPGR)_{t-i} + \sum_{i=0}^p \beta_2 \Delta (EDS/GDP)_{t-i} + \sum_{i=0}^p \beta_3 \Delta (DSS/GDP)_{t-i} \\ & + \sum_{i=0}^p \beta_4 \Delta (NEXP/GDP)_{t-i} + \sum_{i=0}^p \beta_5 \Delta (EXCH)_{t-i} + \sum_{i=0}^p \beta_6 \Delta (TRD)_{t-i} \\ & + \beta_7 ECT_{t-1} \dots \dots \dots (5) \end{aligned}$$

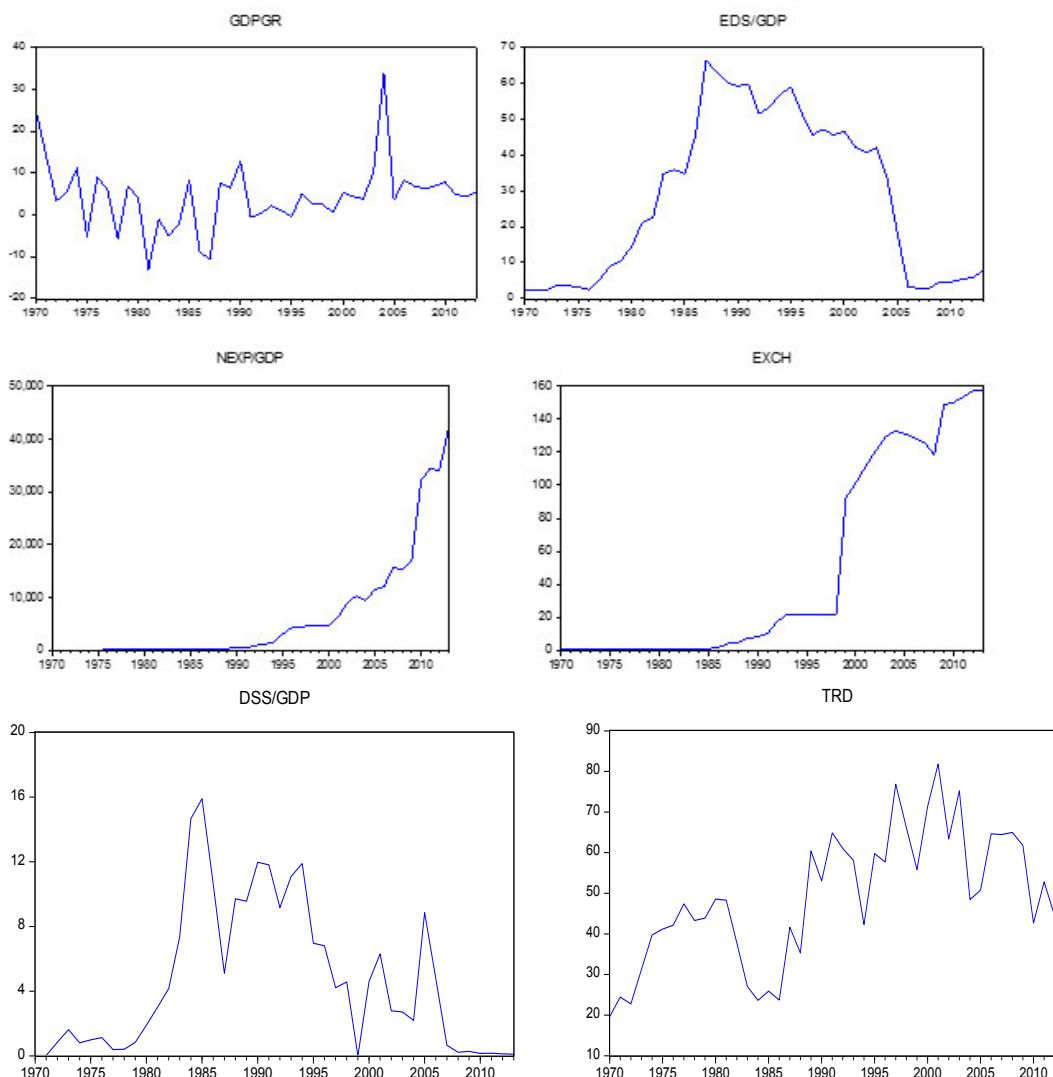
Where ECT is the error correction term defined as

$$\begin{aligned}
 ECT_t = & \Delta GDPGR_t - \beta_0 - \sum_{i=1}^p \beta_1 (GDPGR)_{t-i} - \sum_{i=0}^p \beta_2 (EDS/GDP)_{t-i} \\
 & - \sum_{i=0}^p \beta_3 (DSS/GDP)_{t-i} - \sum_{i=0}^p \beta_4 (NEXP/GDP)_{t-i} - \sum_{i=0}^p \beta_5 (EXCH)_{t-i} \\
 & - \sum_{i=0}^p \beta_6 (TRD)_{t-i} \dots \dots \dots (6)
 \end{aligned}$$

$\beta_7$  in equation 5 represents the speed of adjustment while the other coefficients of the short-run equation are coefficients relating to the short-run dynamics of the model's convergence to equilibrium. In addition we check if there is causality running from the independent variable to the dependent variable.

#### 4. Empirical Results and Discussion

Because the data used for this study is a time series data which is subject to unit root problems, we conducted a test of order of integration for each variable using augmented Dickey-Fuller (ADF) and Phillip Perron (P-P). Prior to that, we check the trend of all the variables which is shown in figure 1 below.



A critical observation of the data reveals that TRD and GDPG have no trend. NEXP and EXCH have positive trends which start very low and then rises very high to the peak level while EDS and DSS start very low rises to the top and then declines strongly but still above zero after which they resume an upward trend. The trend analysis is followed by the unit root test which is represented in table 1 below

**Table 1: Unit root test**

VARIABLES	AUGMENTED DICKEY-FULLER T-STATISTICS	P-VALUE	PHILLIPS-PERRON T-STATISTICS	P-VALUE	ORDER OF INTEGRATION
EDS/GDP	-4.520757	0.0042	-4.420027	0.0055	I(1)
DSS/GDP	-6.460339	0.0000	-12.97107	0.0000	I(1)
EXCH	-6.199867	0.0000	-6.199867	0.0000	I(1)
TRD	-8.772365	0.0000	-8.744301	0.0000	I(1)
NEXP/GDP	1.804143	0.9977	-6.341157	0.0000	I(1)
GDPGR	-5.738307	0.0000	-5.746942	0.0000	I(0)

**Source: Author's computation (2016) From Eviews7**

Table 1 presents the result of the stationarity test using the Augumentated Dickey Fuller and Phillips-Perron test of stationarity. The result shows that only the GDP growth rate (GDPGR) is integrated of order I(0) at 5% level of significance, meaning that it is stationary at level, while the variables DSS/GDP, EDS/GDP, TRD, NEXP/GDP, EXCH become stationary only after first difference, implying that they are integrated of order I(1). Because the variables are mixture of I(1) and I(0) series this therefore necessitated the need for the ARDL bound testing technique.

This is followed by estimating equation 2 and conducting lag length test to estimate the optimum lag length for the variables. According to Pesaram and Shin (1995), we choose two as the maximum order of lags in the ARDL because it is time series data and estimate for the period 1970-2013. We also use the Schwarz Bayesian criterion (SBC) to determine optimum lag length to be included in the unrestricted ECM while ensuring there was no evidence of serial correlation and the stability of the model as emphasized by Pesaran et al. (2001). The result showed that the optimum lag length for GDPGR and NEXP/GDP is one while that of EDS/GDP, DSS/GDP, EXCH and TRD is zero.

Then we estimate equation 3 which examine the long-run relationship among the variables. Conducting the Wald test on the coefficients of unrestricted ECT variables, we obtain the F-statistics. The calculated F-statistics for the cointegration test is displayed in Table 2 below.

**Table 2: F-statistics of cointegration relationship**

Wald Test:

Equation: Untitled

Test Statistic	Value	D.f	Probability
F-statistic	7.910174	(6, 28)	0.0000
Chi-square	47.46104	6	0.0000

**Author's Computation (2016)**

From Table 2 above, the calculated F-statistic of the Wald-test on the level variables is 7.910174 and is higher than the upper bound critical value of 3.61 at the 5% level of significance using unrestricted intercept and no trend. This implies that the null hypothesis of no cointegration cannot be accepted at the 5% level of significance and this therefore confirms the existence of long-run relationship among the variables.

The next step is to estimate the ECM short-run dynamics which result is presented in table 3 below

**Table 3: Short-run error correction model**

Dependent Variable: D(GDPGR)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.091052	1.143609	0.079618	0.9370
D(GDPGR(-1))	0.244560	0.141176	1.732306	0.0926
D(DSS_GDP)	-0.481838	0.394007	-1.222917	0.2300
D(EDS_GDP)	-0.682877	0.177354	-3.850359	0.0005
D(EXCH)	-0.029090	0.085952	-0.338443	0.7372
D(NEXP_GDP)	-0.000721	0.000398	-1.811022	0.0792
D(NEXP_GDP(-1))	0.000189	0.000413	0.458621	0.6495
D(TRD)	-0.201799	0.092943	-2.171205	0.0372
ECT(-1)	-0.371104	0.053598	-6.923840	0.0000

R<sup>2</sup> = 0.677813; Adj. R<sup>2</sup> = 0.599707; D.W = 1.816628; F- Test = 8.678132; Prob (F-Stat) = 0.000003

### Author's Computation (2016)

The result of the ECM presented in table 3 above shows that EDS/GDP is significantly and negatively correlated with output growth at 5% level in the short-run. The value of the coefficient of the EDS/GDP is -0.682877, which depicts that a 1 percent increase in EDS/GDP will bring about 0.68 percent decrease in growth rate. The negative state of this variable supports the Classical view on debt, that government borrowing will have a negative impact on the national economy. This result also confirms the existence of the crowding out theory and debt overhang theory of Krugman (1989) in Nigeria. This theory indicates that a rise in accumulated debt stock results in higher tax on future output and thus crowds out private investment and retard growth. Furthermore, the study corroborates the studies of Iyoha (1999), Elbadawi et al (1996) and Akram (2010). Similarly, NEXP/GDP has a significant negative relationship with output at 10% level of significance. A 1 percent increase in NEXP/GDP will bring about 0.000721 percent decrease in the growth rate.

This suggests that domestic resources significantly depress growth. In other words as more resources are committed to the economy, the less is their effectiveness in achieving higher rate of growth. This result is somehow consistent with a study by Ayadi & Ayadi (2008). TRD which measures Nigerian's openness to international trade also impact negatively significant on economic growth. A 1 percent increase in TRD will bring about 0.2 percent decrease in the growth rate. The negative effect of TRD on growth is probably due to the excess of import over export in the country. According to Jarita (2007), if a nation imports more than it exports, this tends to worsen the trade balance. On the other hand, the impact of DSS/GDP on growth was found to be negative though statistically insignificant. The insignificant impact probably suggests the inability of Nigeria to service her debt effectively which further exerts substantial pressure on its debt stock due to recapitalization of arrears (Ayadi & Ayadi, 2008). The statistical fitness of the model is confirmed by the R square which is 0.677813. This means that 67.78% of the variation in GDPGR is explained by variations in the explanatory variables. The F-statistic (prob.) of 0.000003 also validates the joint contribution of all the explanatory variables in explaining the GDPGR.

The result also show that the ECT(-1) is negative and significant. The significant of ECT is evidence that causality runs in at least one direction. The ECT(-1) of -0.37 is the speed of adjustment from the short-run equilibrium to the long-run equilibrium. This means that 37% of the error is corrected in each time period. This low speed of adjustment implies that it will take approximately three years to correct all errors/deviations and bring the economy back to equilibrium. The model is checked for autocorrelation using the Breusch-Godfrey Serial Correlation LM Test which is shown in table 4 below.

**Table 4: Auto correlation test**

Breusch-Godfrey Serial Correlation LM Test:

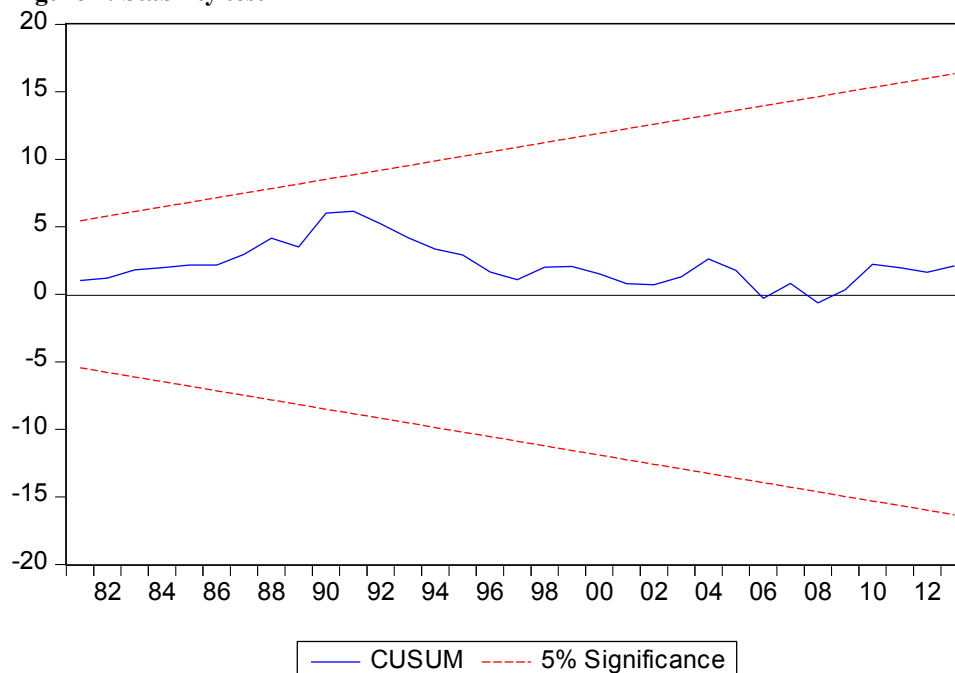
F-statistic	1.379561	Prob. F(2,31)	0.2667
Obs*R-squared	3.432647	Prob. Chi-Square(2)	0.1797

### Author's Computation (2016)

The Table above presents the result of the Breusch-Godfrey test for autocorrelation. From the value of the prob. Chi-Square of 0.1797, we cannot reject the null-hypothesis of no auto correlation which is desirable in the model. This therefore indicates the absence of autocorrelation in the model. Furthermore, the model is subjected to a stability test using the CUSUM test which result is shown in figure 2 below



**Figure 2: Stability test**



The figure above shows the outcome of the CUSUM test of stability which shows the model to be stable, given the fact that the blue line that is in the middle lies in between the two red boarder lines, and does not stray out.

The result of the Granger causality test is presented in table 5 below.

**Table 5: Granger Causality Test**

VARIABLES	CHI-SQUARE	PROB.
EDS/GDP GRANGER CAUSES GDPGR	3.44094	0.0426
EXCH GRANGER CAUSES GDPGR	3.41721	0.0435
TRD GRANGER CAUSES GDPGR	2.46985	0.0984
EDS/GDP GRANGER CAUSES DSS/GDP	5.17329	0.0104
DSS/GDP GRANGER CAUSES EDS/GDP	6.41628	0.0041
EDS/GDP GRANGER CAUSES TRD	4.86660	0.0133
TRD GRANGER CAUSES EXCH	4.29942	0.0209

The result of the causality test shows that at 5% level of significance, EDS/GDP granger causes GDPGR. This result shows a unidirectional causation between EDS/GDP and GDPGR with the causation effect running from EDS/GDP to GDPGR. This finding corroborates the result of Amassoma (2011). Similarly, EXCH granger causes GDPGR, EDS/GDP granger causes TRD and TRD granger causes EXCH while at 10% level of significance TRD granger causes GDPGR. This is evident by the Chi-square and p-values which are significant at 5% and 10% level of significance respectively. On the other hand, there is bi-directional causation between EDS/GDP and DSS/GDP at 5% level of significance.

### Conclusion

This paper attempts to investigate the impact of external debt on economic growth of Nigeria which is an important economic issue that persistently attracts the attention of policy makers with a view to proffering appropriate policy measures that will reduce the adverse effect of external debt and with positive implication on poverty.

To this effect, we employed an open macroeconomic model which includes two external debt indicators (EDS/GDP and DSS/GDP) and other macroeconomic variables. Using an ARDL bound testing approach; we were able to establish a long-run relationship among the variables in use. Also the estimation result of the short-run ECM showed the possibility of a debt overhang and crowing out problem in the growth model. Contrarily, DSS/GDP does not appear to have a significant negative impact on growth rate. Arguably the debt service ratios of Nigeria have been considered to be relatively low compared with her external debt stocks which possibly suggest her inability to service debt efficiently. Invariably this exerts further substantial pressure on its debt stock due to recapitalization of arrears, which in turn tends to shift the responsibility of loan servicing to the next generation. This corroborates Neo-classicals' views that such future loan servicing shifts taxes to

succeeding generations, thereby laying much economic burdens on the next generation. The TRD was also found to be negatively significant against apriori expectation, which probably may not be unconnected to the fact that structurally, Nigeria is an import dependent economy. Finally from the causality test, it was discovered that a unidirectional causality runs from external debt to GDPGR.

The policy implication of this study is that external debt has not been well utilized in Nigeria. As a developing nation, Nigeria no doubt is obliged to seek for external finance to bridge the saving-investment gap, but such external resources should be channeled to productive uses which should stimulate growth and subsequent development of the nation rather than having a negative impact as established by the study. The aforementioned can be achieved by embarking on prudent borrowing i.e. borrowing to finance top priority projects when the rate of return is greater than cost of borrowing. Government should also imbibe the culture of transparency and persistence servicing of debt to avoid recapitalization of arrears which adds pressure to the debt stock. Furthermore, government should also formulate policies that will encourage export oriented manufacturing and high technology products to improve the nations export base as well as reduce its level of deficit financing, for development projects could be financed through increased export earnings rather than resolving into borrowing..

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