Eternal Debt and Economic Growth in Nigeria: An ARDL Approach

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Abstract: The paper examines the impact of external debt on economic growth in Nigeria by taking a critical look into its origin and the process of its metamorphosis to the state of unsustainability before after the debt relief in June 2005. The secondary data collected from Central Bank of Nigeria and World Bank database between 1981 and 2016 were subjected to an ARDL method of analysis to determine both the short and long-run periods. The results show that ratio of external debt to gross national income, ratio of reserves to total debt and foreign exchange rate have a minimal long run positive effect on growth. Also, in the short run, all variables have positive effect on growth except foreign exchange rate which has negative impact. The Error Correction Model shows that there is 106 percent increase over the previous year growth. In conclusion, it is evident that for debt to be productive it requires effective management which will make the rate of return higher than the cost of debt servicing. In spite of this, the study recommends among others, that to achieve a long-term solution to the external debt problem, the spending must be of high priority and use on productive self-liquidating investment.

Keywords: Debt crowding effect; Debt-overhang effect; External debt servicing; Foreign exchange; External reserves

JEL Classification: G00; O10; O40

1. Introduction

Practically, in most countries financing investment through domestic or internally raised sourced of finance alone becomes impossible, the reason for this is not far fetch because the cumulative costs of investment that could lead to substantial economic growth are very high compared to the amount or sum of funds that could be domestically or internally sourced. Thus, less developed countries embark upon borrowing funds from foreign institutions so that their investment plans could be carried out effectively. Also, many countries especially from continent of Africa in the late 1970's and 1980's that suffered from low savings and internal borrowings for investments resulted to external borrowings because of low interest rate. These borrowed funds from abroad were not well utilized for the purpose which they were meant for and later caused economic hardships. As a result, Nigeria's borrowings,

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like other Highly Indebted Poor Countries (HIPC) sky rocketing and becoming hard core debt.

Broadly, Nigeria has some characteristics which are peculiar to HIPC in terms of low per capital income and low economic growth with low savings to execute developmental and other national goals. Consequently, large amount of foreign exchange income meant for developmental process in the country has been diverted to debt servicing. However, the Nigeria economy in the last four decades has unprecedented debt crises.

Historically, external debt in Nigeria's dates back to 1960s with relatively small in amount but soft long term loans from multilateral, World Bank and the country's major trading partners. More so, the oil boom between 1973 and 1976 afforded the country to make substantial revenue from oil. However, the dwindling in oil income as a result of fall in oil prices in 1977/78 prompted Nigeria to obtain her first largest loan of over $1 billion with a grace period from foreign capital market. This loan was not self-liquidating because many medium and long-term development projects used to finance could not yield any returns to meet installment payments obligations. This prompted the government to introduce deflationary measures in 1978, but this was later abandoned when the price of oil reached a high level of US$39.00 per barrel in 1980/81, with the thinking that the economy was buoyant the production and consumption patterns were changed. This situation misled the government to embark on policy of import substitution industrialization strategy which encouraged exchange rate overvaluation, and excessive importation of raw materials and machinery. Coupled with these are problems of under-invoicing of exports and over-invoicing of imports.

Predictably, the collapsed in oil prices in 1982 could not sustain the production and consumption patterns again and this led governments at various levels to engage on large scale borrowings from foreign capital markets. Invariably, this debt burden with its associated adverse effects has become a great worry to the government. Although concerted efforts have been made by the government in terms of managing the external debt but there is need for some fundamental problems to be addressed. In fact, the motivation behind this study is as a result of the divergent opinions in the literature on the effect of external debt on economic growth. It is therefore necessary to examine how external debt affects economic growth in Nigeria.

The rest of the paper is divided into four sections, with the reviews of the literature in section two; section three discusses the methodology of the study. Section four is the presentation and analysis of the data and section five contain conclusion and recommendations.

2. Literature Review

The appropriate theories which are relevant to this study are the dual-gap theory, dependency theory, and the Solow-growth model. Theoretically, dual-gap model postulates that investment is essential for meaningful development and such investment requires domestic savings but it is not a guarantee for development to occur. This gap created by lack of savings for investment leads to external borrowing. Chenery (1966) pointed out that the gap is the major reason for external borrowings which is the difference between low level of savings and investment in an economy, because increasing in savings and investment would invariably lead to rise in economic growth. (Hunt, 2007)

The dependency theory basically outlines the attributes toward the development of the developing countries. The theory assumed that the developed countries becoming richer at the expense of developing countries as a result of flow of the resources from poor and developing countries to wealthy countries. Dependency theory is generally based on the notion that developing countries are in perpetual poverty while developed countries are getting richer by the design poor countries are incorporated into the global system. (Todaro, 2003; Amin, 1976)

This theory's school of thought quite different from free-market economists because the school believes that the poverty of these poor countries was caused as a result of the way they are integrated into the world economy. In this same perspective, the bourgeoisie school of thought explained that the cause of less developed countries underdevelopment and dependence are as a result of their economic misfortune. They believe this issue occurred as a result of these countries lack of accessibility to capital and technology, poor close integration, poor institutional framework, leadership problems, corruption, and mismanagement. Most of these traits exist in Nigeria.

Traditional neoclassical models and some endogenous growth models imply a positive relationship between debt and growth. However, the key assumption of perfect capital mobility is unrealistic and, when dropped, lower debts are associated with higher growth.

Solow growth model hinges on two postulations that only one homogenous good will be produced and consumed by all countries, and that in the short run technology is exogenous. He built this model on a closed economy using labour and capital as its methods of production, which implies that external debt affects growth through domestic savings which in turn used as an investment. So, the debt overhang and debt crowding effects are used separately to analyze the effect of external debt on Solow growth model.

Accordingly, the debt overhang postulates that in debt amortization there is a need for government to increase private sector tax rate so as to transfer resources to the public sector. This invariably reduces private sector investment because expenditure on infrastructure will be reduced due to the diversion of the resources to service debt payments. More so, in the economy the total investments of both private and public sectors will be reduced and this will shift both the curves of investment and production function downward in Solow growth model.

As for the debt crowding out it assumes for utilization of revenue from export earnings to clear the outstanding debts and servicing the forthcoming debt from foreign aid and exchange resources transfers. Those countries which use proceeds from exports for debt repayment do discourage public investment. This will slow down the economic growth and be causing a downward effect in the curves of both the investment and production function in Solow growth model.

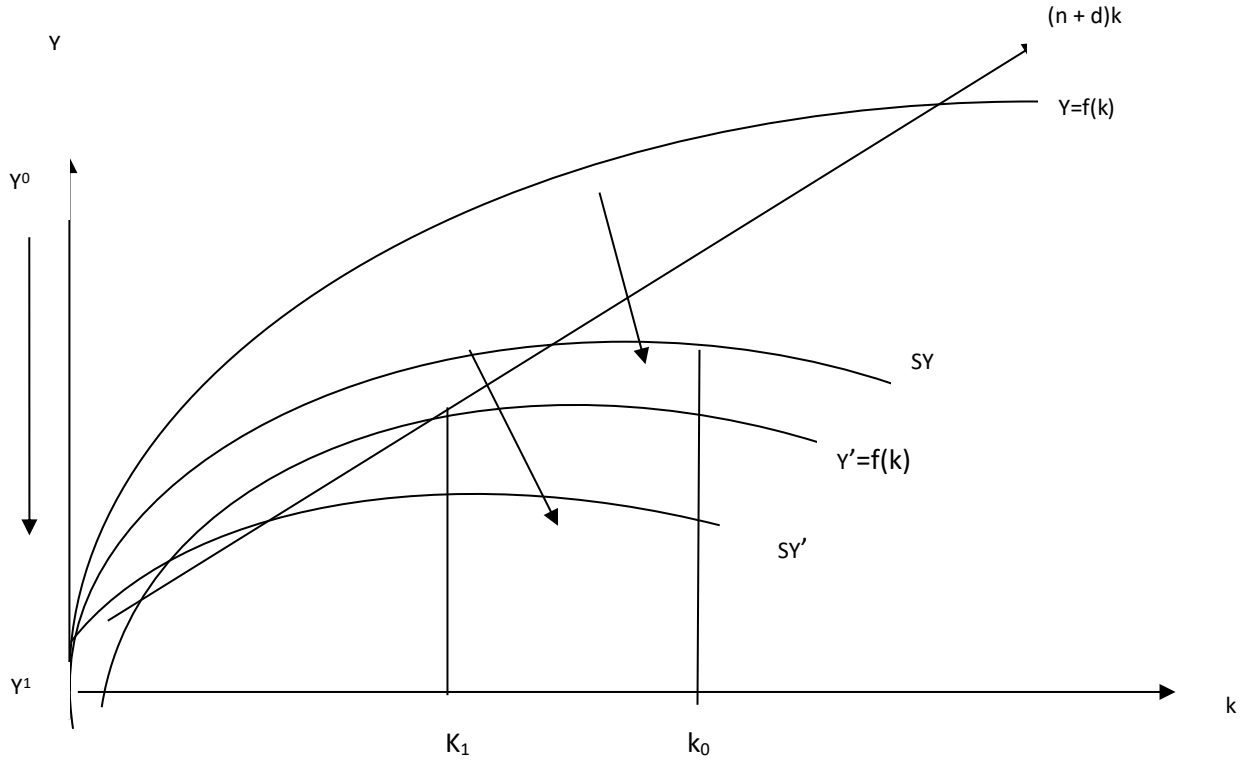

Figure 1. External debt and Solow's production curve

The combined effect of debt crowding out and debt overhang effects will affect investment and economic growth negatively. In line with the literature and stated

hypotheses, this study expects a negative impact of foreign debt on growth which is in line with Solow's investment and production function shown in Fig. 1 above with inward movement of both investment and production curves.

This school of thought suggested to the less developed countries that the ley way out of the problem is to seek for external aid and loan, foreign investment and provide enabling environment for smooth operations of the multinational businesses. It has been observed that most of developing countries depend mainly on the developed countries for most of their needs.

Conceptually, Arnone, Bandiera, and Presbitero (2005) define external debt as such borrowings from international financial institutions, corporations, and foreign governments. Accordingly, Ogbeifin (2007) describes external debt as foreign loans obtained as a result of lack of savings for investment purposes. Definitely, as the gap between the domestic savings and investments widens, the borrowings will be increasing in order for the country to meet its obligations, which invariably lead to debt accumulation. In the same perspective, Albert, Brain, and Palitha (2005) opined that economy can be stimulated through external debt but an accumulation of huge debt may cause a certain proportion of public expenditure and foreign exchange earnings to be eroded by debt servicing and repayment with heavy opportunity costs. Maghyere and Hashemite, 2003; Sanusi, 2003 and Berensmann (2004) also affirmed that sustainable economic growth and poverty reduction can be scuttled by excessive external debt. This makes capital a prerequisite for effective production and sustainable development in any economy but this is relatively scarce, and shortage of this factor is much more rampant in developing countries, particularly in Nigeria.

In addition, Anyanwu (1997) linked the root cause of nation's external debt problems to some unnecessary development projects in Nigeria but suggesting priority should be given to small rural development projects so as to reduce migration to urban areas and reduction in corruption. Aluko and Arowolo (2010) observed that the bane of debt crisis in Nigeria is that most of these external debts are diverted to unproductive use. Instead of being ventured into capital projects that will better the economy, they are shrouded in secrecy.

The Keynesian theory of capital accumulation school of thought argues that capital accumulation is a catalyst for economic growth because external debt will increase capital inflow and when used for productive ventures, stimulates economic growth. However, the external debt may have a negative impact on investment through debt overhang and the credit-rationing problem. (Eduardo, 1989)

Even though the incidence of the debt variables and its magnitude effects differ across different studies, the debt overhang hypothesis has been empirically confirmed. Some authors attribute the slow in growth to the high debt burden, while others observe that both the debt stock and the debt service obligations stifle investment and deter economic growth. Moreover, some early studies reject the

hypothesis that the debt-to-GDP ratio depresses investment while they find evidence in support of the relevance of debt service payments.

In their study, Smyth and Hsing (1995) results show that optimal DEBT-GDP ratio amounted to real GDP growth rate of 38.4%. Essien and Onwioduokit (1998) study also show that external debt is elastic to growth in Nigeria. Savvides (1992), Deshpande (1997), Bauerfreund (1989), Pattillo and Ricci (2002) and Clements, Bhattacharya, Nguyen (2003), Presbitero (2005) and Safdari and Mehrizi (2011) findings show that debt overhang and decreasing foreign capital flows have a significant negative effect on investment rates. In their own study, Elbadawi, Ndulu, and Ndung'u, (1999) found the ratio of debt stock to GDP to be as high as 0.97 (97%). In another perspective, Ejigayehu (2013) found that external debt affects economic growth through debt crowding out rather than debt overhang.

Cordella, Ricci & Ruiz-Arranz (2005) and Imbs & Ranciere (2005) studies explained no correlation in the debt growth relationship. Also, Ogunmuyiwa (2011) using Johansen co-integration test and Vector Error Correction Method (VECM) found no causality between external debt and economic growth in Nigeria. In another perspective, Aminu and Anono (2012) study found that debt stock has positive impact on the economic growth but external debt does not cause GDP, but GDP does cause external debt. Also, Atique and Malik (2012) study results show the significant inverse relationship separately between domestic debt and economic growth, and external debt and economic growth. In addition, Suliman and Azeez (2012) using Johansen Co-integration method of analysis found that there is existence of long-run relationship amongst the variables and that external debt has positive impact on economic growth in Nigerian. Finally, Kasidi and Said (2013) study revealed the positive impact of total external debt stock and negative impact of debt service payment but both are significant.

Amongst all the previous works that evaluated the relationship between external debt and growth, Smyth and Hsing (1995) study is the only empirical attempt that evaluates explicitly how optimal debt ratio maximizes growth in Nigeria. Even acknowledging that the estimates might be flawed by statistical problems, their conclusions are quite pessimistic on the likelihood of debt ratio to bring the expected benefits in terms of economic growth. So, due to inconsistency in their results the relationship between debt and growth needs more clarification. (Moss & Chiang, 2003) Also, this study included other policy institutional variables, such as exchange rate and foreign reserves, which are often neglected in other studies that could be a common determinant of both low and high growth. These gaps need to be filled.

3. Methodology

In this study time series data were obtained from Central Bank of Nigeria (CBN) statistical bulletin and World Bank database from 1981-2016 using ARDL regression method of analysis to determine the long and short-run relationships among the variables. In addition, Granger causality test was used to determine the directions of the variables of the study. The three hypotheses tested in this study are:

Ho: External debt has no significant effect on economic growth in Nigeria.

Ho: External reserves have no significant effect on economic growth in Nigeria.

Ho: Exchange rate has no significant impact on economic growth in Nigeria.

3.1. Model Specification

Solow growth model served as the basis for the model of this study in the form of:

$Y = F(K, L)$

Taking into consideration the measurements of some variables in the literature and the theoretical arguments, we specify our equations based on extension of the works of Pattillo (2002); Presbitero (2005) and Kasidi and Said (2013) assertion on model building by including external debt as % gross national income, total external reserves as % of external debt and exchange rate.

The model is structured as follows:

$GR = f(EDEBT/GNI, TR/EDEBT, EXR)$ …….... (1)

$GR = \alpha_0 + b_1 EDEBT/GNI + b_2 TR/EDEBT + b_3 EXR + \mu$ ……...(2)

3.2. ARDL Model

According to Pesaran and Pesaran (1997), and Pesaran , Shin and Smith (2001) the augmented ARDL model is expressed as:

$$Dy_t = c_0 + c_1 t + \lambda_{yx} Z_{t-1} + \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-I} + \sum_{i=1}^{p-1} \gamma_i \Delta x_{t-I} + \delta_t w_t + u_t$$

$t = 1, \ldots\ldots, n$ (3)

where, y_t is the dependent variable, c_0 is the constant term, x_{it} are the independent variables, L is lag operator, and w_t is the $s \times 1$ vector of deterministic variables and other exogenous variables with fixed lags. We can obtain the unrestricted ECM version of the ARDL model by rewriting Eq. (3) in terms of the lagged levels and first difference of $y_t, x_{1t}, x_{2t}, \ldots\ldots x_{kt}$, and wt as follows:

$$Dy_t = c_0 + c_1 t + \lambda_{yx} Z_{t-1} + \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-I} + \sum_{i=1}^{p-1} \gamma_i \Delta x_{t-I} + \delta_t w_t + u_t \quad (4)$$

Where Δ is the first difference operator, t is the trends, the coefficient $\boldsymbol{\gamma_i}$ is expressing the short run dynamics of the model's convergence to equilibrium and $z_t = (y'_t, x'_t)$.

For estimation the economic growth in Eq. (1) can be expressed in the UECM version of the ARDL model (Pesaran, Shin, and Smith (2001) and Bahmani-Oskooee and Nasir, 2004). It can be rewriting in this form as:

$$D(LGR)_t = \alpha_0 + \alpha_1(LGR)_{t-i} + \alpha_2(L\ EDEBT/GNI)_{t-i} + \alpha_3(L\ TR/EDEBT)_{t-i} + \alpha_4(L\ EXR)_{t-i} + \sum_{k=0}^{n} \alpha_5 \Delta(LGR)_{t-1} + \sum_{k=0}^{n} \alpha_6 \Delta(L\ EDEBT/GNI)_{t-1} + \sum_{k=0}^{n} \alpha_7 \Delta(LTR/EDEBT)_{t-1} + \sum_{k=0}^{n} \alpha_8\ \Delta(LEXR)_{t-1} + \varepsilon_t \quad (5)$$

where Δ is the first-difference operator and u_t is error term. The parameters α_i (i = 1–4) explain the long run multipliers of the estimates, while the α_i (i = 5–8) explain the short run dynamic coefficients.

In this study, the justification for using and ARDL are the followings: its efficiency in the small samples studies to establish cointegrating among variables (Ghatak and Siddiki, 2001; Tang, 2003), it can be used at different levels of integration e.g. I(1) and I(0), it allows decision to be made to include any endogenous and exogenous variables for the treatment of deterministic elements, the order of VAR, and the number of lags to be used. (Pahlavani et al., 2005; Pesaran & Smith, 1998) Moreover, the ARDL allows for more optimal lags for different variables; but Johansen cointegration method requires a uniform number of optimal lags. (Pahlavani et al., 2005) In their separate studies, both Tang (2003) and Mohammad & Aboulfazl (2007) used ARDL Bounds test approach with 18 and 27 annual observations respectively to estimate their studies in Japan and Iranian economy respectively. Therefore, in this study with 35 observations the use of ARDL Bounds test method of analysis is preferable.

where:

GR = Growth in Gross Domestic Product (Economic Growth);

EDEBT/GNI = External Debt as % of Gross National Income;

TR/EDEBT = Total External Reserves as % of External Debt;

EXR = Exchange Rate;

μ = Error term.

Real Gross Domestic Product is the value of goods and services produced in a given year and it is used in this study as a proxy for economic growth because it provides a more accurate figure because inflation has been adjusted for.

Foreign Debt serves as borrowings from international financial institutions, companies and foreign governments. Total foreign debt can comprise of both short-term and long-term liabilities.

Foreign exchange reserves are foreign assets held by a central bank in foreign currencies, used to meet its foreign liabilities in terms of issued local currency as well as to influence monetary policy.

An exchange rate is the rate at one country's local currency is exchange for another country's currency.

3.3. A Priori Expectation

Based on the theoretical underpinning the model, a priori expectation is that there is a negative relationship between external debt and economic growth; a positive relationship between economic growth and foreign reserves and a positive relationship between economic growth and exchange rate i.e. an increase in exchange rate may result to high growth rate in the economy.

$b_1, < 0, b_2, b_3 > 0$

4.2 Interpretation of Results

4.1. Unit Root Test Results

ADF unit root test indicates that the variables are of different order, i.e., I(0) and I(1) series. In this case the study rejects the null hypothesis of a unit root at the 1% level of significant. Given the results reported in Table 1, we are justified to conduct an ARDL regression analysis on LGR, LEXDEBT_GNI, LREV_DEBT and LEXCH.

Table 1. ADF Unit Root Test

Variables	ADF Test Statistics	1% Critical Value ADF	Order of Integration	Remarks
GR	- 4.8143	-3.6329	I(0)	Level Stationary
EXDEBT_GNI	-7.0113	-3.6394	I(1)	Difference Stationary
REV_DEBT	-5.9109	-3.6329	I(0)	Level Stationary
EXCH	-3.6692	-3.6394	I(1)	Difference Stationary

Source: Author's Compilation, 2018

4.2. ARDL Bound Test

The maximum number of lags for both the dependent variable and the regressor is 4 with 34 observations. The F-statistics calculated for all underlined variables (i.e. economic growth, external debt, foreign reserves and exchange rate) fall outside the critical bounds at the 1 and 5 percent levels of significance. The calculated F-statistic is higher than the Pesaran et al. (2001) upper bound critical value at 99% level of significance, so there is need to reject the null hypothesis which states that there is no cointegration, which suggests that the variables under consideration are cointegrated and they have the long-run relationship.

Table 2. ARDL Bounds Test

Null Hypothesis: No long-run relationships exist			
Test Statistic	Value	k	
F- statistic	6.806265	3	
Critical Value Bounds			
Significance	Lower Bound Value	Upper Bound Value	
10%	3.47	4.45	
5%	4.01	5.07	
1%	5.17	6.36	

Source: Author's Compilation, 2018

4.3. Long and Short Run Estimates

The estimated coefficients of the long-run relationship between GRt, EXD_GNIt, REVDEBTt and EXCHt are expected to be significant, that is:

GRt, = 0.506539 + 0.0068 (EXD_GNIt) + 0.000014 (REVDEBT)t + 0.047***(EXCH)t

The result of equation (5) in table 3 below indicate that external debt, foreign reserves and exchange rate components have minimal but positive impact on economic growth in the long run. However, foreign reserves have minimal impact on economic growth due to low level reserves maintain by the country. More so, high level of external debt led to devaluation of the nation currency. One percent increase in external debt, foreign reserves and exchange rate components leads to 0.0068%, 0.000014% and 0.047% respectively in economic growth. This shows that all components contribute to the growth of Nigerian economy in the long-run positively, but only exchange rate is significant at 10% level over the period under review. This implies that the effect of exchange rate on economic growth can be determined by several factors.

Table 3. Estimated model based on equation (5) (Long and short run estimates) .

Variable	Coefficient	Standard error	t-statistic	Probability
EXDEBT_GNI	0.006748	0.029711	0.227141	0.8220
REVDEBT	0.000014	0.000021	0.637645	0.5291
EXCH	0.046557	0.026657	1.746535	0.0921
C	0.506539	4.067837	0.124523	0.9018
D(GR(-1))	0.179794	0.260275	0.690783	0.4956

D(EXDEBT_GNI)	0.007208	0.031777	0.226827	0.8223
D(REVDEBT)	0.000015	0.000024	0.595821	0.5563
D(EXCH)	-0.073426	0.080601	-0.910978	0.3704
CointEq(-1)	-1.068081*	0.290318	-3.678998	0.0010

*, **, *** indicate 1%, 5% and 10% significant level, respectively.

Source: Author's Computation, 2018

4.4. Short Run Dynamics and Error Correction Model

The short-run dynamics among the variables are explored by employing error correction mechanism (ECM). Error correction model allows for the introduction of previous disequilibrium as independent variables in the dynamic behavior of existing variables, that is, it explains the speed of adjustment in restoring the equilibrium in the dynamic model with a negative sign. Bannerjee, Dolado, and Mestre (1998) also observe that a significant ECM is evidence that a stable long-term relationship exists. Table 3 above shows the result of ECM in terms of changes in economic growth to change in other variables. The magnitude of the ECT coefficient of -1.06 at 1 percent level of significance shows that the speed of adjustment towards long-run equilibrium is very high, that is, there is 106 percent increase over the previous year. Also, the results show that the past year of GDP impacted positively on the current GDP, however the relationship between past GDP and the current is inelastic, therefore, an increase in the past year GDP causes current GDP to increase by 0.179 units. Considering exchange rate component, the immediate past records of exchange rate component had a negative impact on economic growth which is evidence that depreciation in foreign exchange rate reduces economic growth. Just like in the long run the immediate past record of external debt component had a minimal positive impact on economic growth in the short run. This is a pure indication that external debt had not been used for highly priority and productive self-liquidating investment. So the policy implication of this is to set up appropriate debt management strategies for economic growth enhancement. In addition, foreign reserves component had a positive but minimal impact on economic growth. This is owing to the fact that the country has been able to increase her foreign reserves in the past one year. Overall, the results show that the debt relief has minimal impact on economic growth which is a reflection of low standard of living of an average Nigerian.

4.5. Diagnostic Test

In order to make the study more robust the following diagnostic tests such as Breusch- Godfrey serial correlation LM test, Breusch-Pagan-Godfrey Heteroskedasticity test, Jacque-Bera normality test and Ramsey RESET Test were

carried out. These tests show that there is no serial correlation, presence of homoscedastic and normal distribution. Hence, the model is line with the econometric properties and the results are suitable for reliable interpretation and policy implication.

Table 4. Diagnostic Test Results

Jarque-Bera = 73.0197* (0.0000); Heteroskedasticity test (Breusch-Pagan-Godfrey) = 0.1283 (0.9917); Breusch-Godfrey serial correlation LM Test = 0.9116 (0.4148); Ramsey RESET Test = 0.1717 (0.6820) .

*, ** and *** indicate significance at 0.01, 0.05 and 0.10 level respectively. Probability values are shown in brackets.

Source: Author's Compilation, 2018

5. Conclusion and Recommendations

5.1. Conclusion

The paper examined the effect of external debt on economic growth using a model that explains the annual growth rate of the GDP level with some external debt variables. Using an ARDL regression method our results show that external debt, exchange rate and foreign reserves have positive effect on economic growth, however, only exchange rate has a significant impact on economic growth. Thus, it implies that the effect of exchange rate on economic growth can be determined by several factors. In the short run both exchange rate and foreign reserves have positive and significant impact on economic growth but external debt has negative and no significant impact. In conclusion debt can only be productive if properly managed through the process of making the rate of return higher than the cost of debt servicing. From our study, the policy implications that can be drawn up from the results are that there is need for government to embark on efficient loan utilization; effective debt management practices and efficient trade and exchange rate policies.

5.2. Recommendations

Based on our major findings, other areas which can make external debt productive and sustainable in Nigeria as well enhancing economic growth include:

- Stability in political and economic systems for effective debt management.

- Effective negotiation method for fixed interest payment and varying amortization schemes need to be put in place. Also, there is need to bargain for multi-year rescheduling rather than a yearly basis.

- External debt should only be used to finance productive self-liquidating projects which have to be properly appraised and of high priority.

- Finally, there should be proper guidelines for the external loan, stimulation of private sector and Fiscal Responsibility Bill must strictly adhere to.

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