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MODELLING THE NEXUS BETWEEN EXTERNAL DEBT BURDEN AND ECONOMIC GROWTH IN NIGERIA: THE ARDL METHODOLOGY

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Abstract: This paper ascertains the nexus between external debt burden and economic growth in Nigeria by specifically evaluating the nexus and effect of external debt burden on gross domestic product and index of industrial. To achieve these objectives, we employed the ordinary least square method of estimation and granger causality test in which variations in gross domestic product and index of industrial production were regressed on external debt burden using time series data from 1981 to 2015. Secondary data casing the time frame were collected from Central Bank of Nigeria statistical bulletin. Our estimated output suggests that there is a long run nexus between external debt burden and economic growth in Nigeria. Again, external debt burden has no significant effect on gross domestic product and index of industrial production. Gross domestic product and index of industrial production have positive insignificant relationship with external debt burden. This lends credence to the dual gap theory which expresses economic growth as a function of investment, and for investments to be successfully executed, there must be domestic savings which is lacking in emerging economies. Relying on our estimated results, we are of the opinion that external debt should be contracted solely for economic reasons and not for social or political reasons as the case in Nigeria. Though external loan is not an evil, but to enhance our industrial performance, industries oriented policies should be initiated and implemented. Funds borrowed externally should be channelled to capital expenditures which improves the manufacturing capacity, generates employments and reduced poverty.

Keywords: External debt management; economic growth; index of industrial production.

I INTRODUCTION

Developing countries seek external finance to enhance economic growth on the argument that borrowing domestically would lead to depletion of domestic resources which would hamper growth. The justification adduced for this avowal is liquidity constraint on account of poor domestic savings and private investments. In such a state of affairs, government will experience dilemma to spur economic growth and improve her citizens' standard of living by way of financing higher level of consumption and investment. As a

result, borrowing externally by developing countries of the world should not be seen as a misplaced government priority provided the funds obtained are properly and religiously used for what it was sorted for. With this argument favoring economic growth through external finance based on theoretical foundation, Nigeria resorted to increased external borrowing especially, with the introduction of the Structural Adjustment programmed in 1986. Again, owing to the developing nature of our financial market, domestically sourcing funds from the capital market via issuance of treasury bills, bonds and commercial papers would be very

expensive compared to borrowing such fund from international financial institutions like International Monetary Funds, Paris Club, London Club and Multilateral Organizations. Nevertheless, effective and judicious utilization of borrowed funds in productive economic activities vehemently, determine whether or not emerging economies will reap the benefits of external debt as assumed by the Keynesian economists. For this reason, Adepoju, Salau and Obayelu (2007) argue that debt financed investments need to be productive and well managed enough to earn a rate of return higher than the cost of debt servicing. In a similar manner, Hameed, Ashraf and Chaudary (2008) emphatically, assert that appropriate utilization of external debt results in a multiplier effect which in turn, leads to increased employment, adequate infrastructural base, larger export market, improved exchange rate and favorable terms of trade.

Though external debt is beneficial for developing countries to increase output, emphases should be based on a certain threshold and on proper usage of the funds borrowed. Following Pattilo, Poirson and Ricci (2002), a low level of debt would positively increase a nation's output over a period of time, however, the growth impact would be dealt a big blow if the level of debt exceeds a specified threshold. The debt structure of Nigeria has been increasingly on the rise over the years. The citizens and various stakeholders in the economic cycle have complained that the benefits attached to external debt have not been felt in the country. Majority of the population wallow in poverty, no steady power supply, no improvement in basic infrastructures such a roads and health care system among others, the level of inflation at current has risen to an all-time high coupled with economic recession prevailing at the moment. For the benefit of doubts, the external debt structure rose significantly by over 100% from ₦1, 026.90 billion in 2012 to ₦2, 112.53 billion in 2015, just within a period of three years. Similarly, domestic debt outstanding surged to ₦8, 837 billion in 2015 as against ₦6, 537.54 billion in 2012. In term of instruments of acquisition of these debts by the government, treasury bills and Federal Government of Nigeria bonds had the lion share compared to treasury bonds, promissory notes and treasury certificates. The debt accumulated from treasury bills and Federal Government of Nigeria bonds skyrocketed from ₦1, 727.91 billion and ₦2, 901.60 billion in 2012 to ₦2, 772.87 billion and ₦5, 808.14 billion in 2015 respectively. Within the same period, the government serviced domestic and external debt to the tune of ₦996.80 billion and ₦1, 060.38 billion 2015 in comparison to ₦632.90 billion and ₦679.30 in 2012 respectively. Despite this scenario in our debt profile, the government came forward

with a proposal seeking ₦2, 320 billion loan, about 2.18% of gross domestic product to finance the 2017 budget.

This request resulted in a wide condemnation by various stakeholders in the country especially, politicians from the opposition party on the ground that the present government is plugging the country in a more severe debt that would hinder the growth of the country in the long run. These stakeholders are of the view that acquisition of such huge loan at this period of fall in price of crude oil in the international market will derail the necessary funds to command economic production when eventually the debt service obligation begins. Besides, we are in 6th (June) month of year and the budget of 2017 was passed by the parliament on the 11th May, 2017 while the acting president just signed it few days ago: on the 12th June, 2017. The signing of the 2017 budget on the said date has been greeted with disappointments as political elites see it as another avenue to siphoning public funds meant for growth and development of the economy by few privileged individuals who happen to be in position of authority, as it is practically impossible to implement even 50% of the 2017 fiscal year appropriation following the bureaucratic bottlenecks and corruptions in the Nigerian Civil Services Commission (NCSC).

Distinctly, aside the mixed empirical evidences in developed and other emerging countries of the world, the debate on the nexus between external debt burden and economic growth is still controversial in the context of Nigeria. The empirical studies conducted by Ijeoma (2013), Emerenimi and Anyanwu (2015), Inimiole, Imoughele and Okhueuse (2014), Ajayi and Oke (2012) revealed that external debt has depressed economic growth in Nigeria. This is confusing in the sense that Gabdo and Aminu (2013), Sulaiman and Azeze (2012), Mbanasor and Okere (2012), Ishola, Olaleye, Ajayi and Giwa (2013), Onyekwelu, Okoye and Ugwuanyi (2014) and Ajao and Ogeiemudia (2012) asserted that external debt contributes positively to growth of the economy. Furthermore, Obademi (2015) and Udeh, Ugwu and Onwuka (2016) showed that external debt only improved economic growth and development in short run but would be detrimental to the economy in the long run. With this, it would be ideal to revisit the nexus between external debt burden and economic growth in Nigeria in recent time of steady rise in debt structure coupled with the federal government proposal to borrowing ₦2, 320 billion loan amidst ₦2, 112.53 billion and ₦8, 837 billion external and domestic debt level respectively. Objectively, it is the aim of this paper to ascertain the nexus between external debt burden and economic growth in Nigeria surrogated by gross domestic product. In auxiliary, we went further to evaluate the effect of

external debt burden on Nigeria's index of industrial production and economic growth as well.

To appreciate the content of this paper, it was unnerved to sections with introduction as section one. In section two, conceptual issues, theoretical background (precisely) and empirical evidences were spelt out. In section three, we treated the methodological technique applied. Section four discussed the results of the models estimation while in section five, we concluded the paper and proffered some policy recommendations.

II RELEVANT LITERATURE REVIEW

2.1 Conceptual Issues

External debt burden is the magnitude of fund a country owed private, public, multi-lateral organizations or governments of other countries. External debt management is an important facet of government fiscal policy predominantly in developing countries. External debt management sharpens the fiscal policy of the government as cautiously managing external debt would emancipates the procedures which interest obligation and principal payment would be made in such a way as not to hinder government investment in productive economic activities. That not with standing, the financial muscle of any nation to effectively and efficiently service and contract foreign debt also boils down to debt management. Following Anyanwu (2016), external debt management in Nigeria has been a great concern following the increasing debt servicing burden such that if adequate provision is not made to meet up her maturing financial obligation, economic growth will be hindered and external sector viability will be threatened. Debt management is any strategy that helps a debtor to repay or otherwise handle their better because, it may involve working with creditors to restructure debt or helping the debtor manages payments more effectively (Emerenini & Anyanwu, 2015).

In Nigeria, the Debt Management Office (DMO) is saddled with the function of Debt management. The DMO has attributed Nigeria's external debt burden to inefficient trade and foreign exchange rate policies, adverse exchange rate movements, interest rate movements, poor lending and inefficient loan utilization, poor debt management practices in the pasts and accumulation of arrears and penalties. In terms of the devastating impact of arrears, interest and penalties, the DMO reported in 2017 that the huge arrears, penalties and interest accumulated over the years between 1985 to 1998 before its creation on 4th October, 2000 by then president, General Olusegun Obasanjo resulted in the present debt profile. The current level of debt (both domestic and external) was also partly necessitated by year 2000 rescheduling arrears

build up and difficulty in making full contractual payments to creditors due to budget constraint. The DMO has tried within the ambit of the act establishing it to ensure coordinated management of debt, however, political inference from the executive arm of government still pose a challenge.

2.2 Theoretical Review

External debt burden and economic growth have been discussed along different theories *visa viz*: dual-gap theory, debt overhang theory, crowding-out effect theory and dependency theory. These theories are very relevant in this paper and serve as a foundation. We precisely and unambiguously bring to light the major ingredients of these theories. The dual gap theory prepossess that for a nation to realize a considerable level of economic growth, there must be investments, and such investments can be actualize by the availability of domestic savings. Thus external borrowing is the tool for bridging the gap created by insufficient domestic savings. Relying on Omoruyi (2005), emerging economies go for external debt in a bid to fill the lacuna initiated by poor domestic savings to carry out productive investments. Econometrically, the dual gap theory expresses economic growth as a function of investment, and for investments to be successfully executed, there must be domestics saving which is lacking in emerging economies.

The debt overhang theory relates to a situation where a country accumulates more debt than it can pay. A country witnessing the validity of the debt overhang theory mostly resorts to high taxation to improve revenue, and when such is the case, private investments is crowded out which in turn affects economic growth and development. Funds that would have being invested in production to create employments, reduce poverty and inflation will then be applied to service debt. Borrowing largely from the domestic segments in most cases, lead to more depreciation the economy's output as the available funds within the economy is been used to service debt. The crowding out effect theory entails a condition where government revenue from foreign exchange are channeled to debt obligation. This depletes the resources for investments and worsens the exchange rate of the host country against other countries. From the crowding effect assumption, a nation facing high debt servicing is bound to reduce expenditure which affects overall well-being of citizens. The attention of the government will drift away from developing the economy to servicing debts, which is not ideal for any country at all. Governments in most cases try to avoid the occurrence of this scenario as it could spell doom for the economy or send bad signals to outside investors resulting in depreciation in foreign direct and portfolio investments. The dependency theory assumes that there is a unidirectional

relationship between resources in developing and developed economy, and causality flows from resources in developing to developed economy. The theory argues that through external debt, resources flows from developing to developed economies. From the perspective of the dependency theory, when it comes to debt, the relationship between a debt contracting country (a country seeking for debt) and contracted country (a country who has offered debt) is more of a parasitic relationship as against a symbiosis relationship. The developed country will indirectly detects economic policies for the developing country, and as such, the developed country is enriched while the developing country is impoverished.

2.3 Empirical Review

The empirical evidences on external debt burden and economic growth nexus is diverse and still subject to further debates owing to inconsistencies in empirical findings of different academic scholars. The empirical studies we presented in this section were the abstracts of the academic articles reviewed. Ijeoma (2013) assessed the impact of debt on selected macroeconomic indicators in Nigerian economy for the period 1980-2010. Data for the study were collected from Debt Management Office, CBN statistical bulletin, and internet materials and analyzed with linear regression. The study found that Nigeria's external debt stock has a significant effect on her economic growth.

It also revealed that there is a significant relationship between Nigeria's debt service payment and her gross fixed capital formation. Obademi (2015) examined the impact of public debt on economic growth using Nigeria as a case study. An analysis of the long-run relationship and impact of debt from the perspective of the value impact and proportional impact was done. An augmented Cobb Douglas model was used and subsequently a dynamic version of the functional relationship was estimated using co-integration technique to capture the long-run impact of debt variables on economic growth. The result showed that the joint impact of debt on economic growth is negative and quite significant in the long-run though in the short-run the impact of borrowed funds and coefficient of budget deficit is positive. Gabdo and Aminu (2013) analyzed the impact of external debt on economic growth in Nigeria. The time series data were derived from Central Bank of Nigeria statistical bulletins and Debt Management Office (DMO) publications from 1992-2012. The estimated techniques include the Ordinary Least Square (OLS) method, Augmented Dickey- Fuller (ADF) unit root test, Johansen Co-integration test and Error Correction Method (ECM).

The result revealed that external debt impacted positively on economic performance of Nigeria. Emerenimi and Anyanwu (2015) evaluated the effectiveness of external debt on economic growth within a span of 1981-2012. The data were collected from CBN Statistical Bulletin 2010 and the Debt Management Office (DMO) quarterly report. The Engle and Granger co-integration and Ordinary Least Square (OLS) were employed in the cause of this study. The result of the analyses showed that rising external debt stock inhibits the pace of economic growth of Nigeria by increasing the cost of its servicing beyond the debt sustainability limit while external debt servicing was found not to impair economic growth.

Imimole, Imoughele and Okhause (2014) ascertained the extent to which Nigeria's external debt relates to indices of ability to pay in order to ascertain the sustainability of it and to identify the main determinants of her external indebtedness for the period 1986 to 2010. Based on available data and the use of statistical methods, they observed that Nigeria's external debt is not sustainable in terms of willingness and ability to pay, and that the country's external debt is characterized by capital flight as a result of external debt accumulation.

The result from co-integration test showed the presence of long run relationship between external debt and the explanatory variables. The study also found that the main determinants of Nigeria's external debt are gross domestic product, debt service and exchange rate. Ajayi and Oke (2012) investigated the effect of the external debt burden on economic growth and development of Nigeria. It adopted regression analysis on secondary data sourced from Central Bank of Nigeria on variable like national income, debt service payment, external reserves, and interest rate among others. The finding indicates that external debt burden had an adverse effect on the nation income and per capital income of the nation. High level of external debt led to devaluation of the nation currency, increase in retrenchment of workers, continuous industrial strike and poor educational system. Sulaiman and Azeez (2012) determined the effect of external debt on the economic growth of Nigeria.

The model built for the study proxy gross domestic product as the endogenous variable measuring economic growth as a function of external debt, ratio of external debt to export, inflation, and exchange rate proxy as the exogenous variables. Annual time series data were gathered from the Central Bank of Nigeria Statistical bulletin and Debt Management Office from 1970 to 2010. The econometric techniques of Ordinary Least Square, Augmented Dickey-Fuller (ADF) Unit Root test, Johansen Co-integration test and

Error Correction Method (ECM) were employed in the empirical analysis. The co-integration test showed that long-run equilibrium relationship exist among the variables. The finding from the error correction method showed that external debt has contributed positively to the Nigerian economy. Mbanasor and Okere (2012) empirically examined the effects of external public debt on the economic growth of Nigeria. The researchers collected secondary data from Central Bank of Nigeria statistical bulletin. The multiple regression analysis was used to find the relationship between Nigeria external debt and Nigeria Gross Domestic Product (GDP). The result showed that there is a minimal positive relationship between external debt stock and gross domestic product.

Onyekwelu, Okoye and Ugwuanyi (2014) evaluated external debts management strategies in developing economies and its implications on some key economic indices using Nigeria as a case study. The quantitative data for analysis were gathered from the statistical bulletins/releases of relevant government agencies like the Debt Management Office, Central Bank and the Office of the Accountant General of the Federation. Data were analyzed using the Linear Regression and Analysis of Variance (ANOVA).

The linear regression showed that there is a positive and significant relationship between the size of External Debts and Gross Domestic Product (GDP), Capital Expenditure, External Reserves and Exports. However, the Analysis of Variance (ANOVA) revealed a negative correlation between External Debts and the variables studied. The study attributes this anomaly to mismanagement of credit facilities, unfavorable loan terms characterized by capitalization/compounding of interests, weak economic base, poorly co-ordinate statistics on loans and overdependence on foreign aids among others. Ishola, Olaleye, Ajayi and Giwa (2013) assessed the impact of external debt on sustainable economic growth with particular emphasis on Nigeria from 1980-2010. The study used ordinary least square regression technique to draw out inferences on the relationship between external debt and economic growth. They result suggest that 12.3% changes in economic growth was caused by external debt and prime lending rate. Udeh, Ugwu and Onwuka (2016) ascertained the impact of external debt on economic growth in Nigeria from 1980 to 2013. Ex-post facto research design was adopted for the study. While data on Gross Domestic Product (GDP), External Debt Stock and External Debt Service Payment were obtained from World Bank International Debt Statistics, Exchange Rate data were collected from Central Bank of Nigeria statistical bulletin, 2013. Model was formulated and data were analyzed using Ordinary Least Square. Diagnostic tests were conducted using Augmented

Dick Fuller Unit Root Test, Co-integration and Error Correction Model. The independent variable was Gross Domestic Product (GDP), while the explanatory variables were External Debt Stock, External Debt Service Payment and Exchange Rate.

They discovered that External Debt had a positive relationship with Gross Domestic Product at short run, but a negative relationship at long run. Also, while External Debt Service Payment had negative relationship with Gross Domestic Product, Exchange Rate had a positive relationship with it. Ajao and Ogiemudia (2012) analyzed the effect of foreign debt management on sustainable economic development with specific emphasis on Nigeria over the period of 1979–2009. Data analysis shows that access to external finances strongly influence the economic development process of Nigeria and other nations. The ordinary least square multiple regression analytical method was used to examine the relationship between external debt management and economic development, while error correction model (ECM) is use to determine the long-run and short run dynamics among the relevant variables. The empirical result showed that there is a significant relationship between external debt and economic development in Nigeria, external debt stock contributes significantly to Nigeria's gross domestic product while debt servicing had a negative but insignificant impact on Nigeria's gross domestic product. The result also revealed that external debt stock and debt servicing had a mix delay effect on the Nigerian economy.

III RESEARCH METHOD

In ascertaining the nexus between external debt burden, economic growth and index of industrial production, we applied the Auto-Regressive Distributed Lag (ARDL) Model. The choice of ARDL is on the fact that it takes into consideration mixed order of integration which most time series data are known to possess. On the other hand, the effect of external debt burden on economic growth and index of industrial production was evaluated using the Granger Causality effect assessment. The data for the variables from 1981 to 2015 were sourced from the 2015 statistical bulletin of Central Bank of Nigeria. Gross Domestic Product Growth Rate (GDPGR) and Index of Industrial Production (IIP) are the dependent variables. We proxied external debt burden, which is the independent variable with external debt outstanding over the period reviewed. In our desire to only ascertain the extent our external debt burden has affected national output and production index, we did not control the probably effect of other macroeconomic variables such as

inflation, exchange rate and interest rate among others when by econometric postulations, it is required.

Model Estimation

Empirically, we mimicked and modified the model of Gabdo and Aminu (2013). The researchers expressed economic growth as a function of external debt burden (measured by the external debt outstanding). We then estimated the equ. 1 and 2 to ascertain the effect of external debt burden on gross domestic product growth rate and index of industrial production

$$GDPGR = f (EDB) \text{ ----- eqe. 1}$$

$$IIP = f (EDB) \text{ ----- eqe. 1}$$

We logarithmically transformed the equ. 1 and 2 to remove any probably effect of outlier which could cause some sorts of bias in the output of regression estimations. Thus:

$$\text{LogGDPGR}_t = a_0 + a_1 \text{LogEDB}_t + \varepsilon_t \text{ ----- eqe.3}$$

$$\text{LogIIP}_t = a_0 + a_1 \text{LogEDB}_t + \varepsilon_t \text{ ----- eqe.4}$$

Where:

GDPGR is gross domestic product growth rate: This is the growth in Nigeria economy from one period to another. The variable was choosing because it captures the actual change in economic growth from previous year to current year. If the economy has grown, it is positive. However, if the economy has not grown, it is negative.

EDB is External Debt Burden: External debt refers to the portion of a country's debt that was borrowed from foreign lenders including commercial banks, governments or international financial institutions.

IIP is the Index of Industrial Production: This is a measure of the production sector of an economy and also indicates the national economic growth. This measure reflects the activities of all the industries in an economy.

α_0 is a constant term, E is a random error/disturbance term and t is the time trend; these are normally included in standard time-series specifications to account for the omitted variables as well as unexplained random effects within the model.

IV DISCUSSION AND RESULTS OF ESTIMATIONS

4.1 Summary Descriptive Statistics

The descriptive characteristics of the variables are presented in Table 1. The mean values of GDPGR, IIP and EDB are 17929809, 127.9703 and 1102165 while their median are 4110750, 129.9000 and 606625 respectively. The series depict the maximum values of 95090000, 158.9000 and 4890270 for GDPGR, IIP and EDB respectively. The minimum values are 94300.00 for GDPGR, 91.60000 for IIP and 2330.000 for EDB. All the variables are positively skewed towards normality as evidenced by the positive sign of the skewness except IIP. The p-values of Jarque-Bera statistic for

all the data suggest that GDPGR and EDB are normally distributed as the p-values are significant at 5% level of significance. On the other hand, IIP is not normally distributed.

	GDPGR	IIP	EDB
Mean	17929809	127.9703	1102165.
Median	4110750.	129.9000	606625.0
Maximum	95090000	158.9000	4890270.
Minimum	94300.00	91.60000	2330.000
Std. Dev.	28564964	15.45884	1347006.
Skewness	1.662254	-0.509343	1.558301
Kurtosis	4.297465	2.999240	4.294136
Jarque-Bera	18.04233	1.470105	16.13300
Probability	0.000121	0.479480	0.000314
Sum	6.10E+08	4350.990	37473621
Sum Sq. Dev.	2.69E+16	7886.197	5.99E+13
Observations	34	34	34

Table 1: Summary of Descriptive Statistics

Source: Computer output data using E-views 9.0

4.2 Diagnostic Test Result

Serial Correlation LM Test

Unlike the Durbin Watson statistic for AR(1) errors, the LM test may be used to test for higher order ARMA errors and is applicable whether there are lagged dependent variables or not. Therefore, it is recommended in preference to Durbin Watson whenever there are concern that errors may exhibit possible autocorrelations. The null hypothesis of LM test is that there is no serial correlation up lag order 2. The p-values of the Breusch-Godfrey serial correlation test in Table 2 suggest that the null hypothesis could not be rejected. Consequently, the equ. 3 and 4 are free from autocorrelation. This overrides any possible result of Durbin Watson in testing autocorrelation

Table 2: Breusch-Godfrey Serial Correlation Test

Equations	F-statistic	Prob. F(2,30)
equ. 3	0.016460	0.9837
equ. 4	1.625616	0.2196

Source: Computer Output data using E-views 9.0

Heteroskedasticity Test

To ensure we do not have any issue of heteroskedasticity is equ. 3 and 4, we applied the ARCH test of heteroscedasticity and the results summarized in Table 3. Our choice of heteroskedasticity specification was on the fact that in many financial time series, the magnitude of residuals appears to be related to the magnitude of recent residuals. The probability of the Chq. statistic for equ. 3 and 4 are insignificant at 5% level of significance, suggesting that there is no existence of heteroskedasticity. This is in line with econometric assumption that a model should be free from problem of heteroskedasticity.

Table 3: ARCH LM Heteroskedasticity

Equation s	F-statistic	Probability
equ. 3	0.007438	0.9319
equ. 4	0.008786	0.9260

Source: Computer Output data using E-views 9.0

Ramsey RESET Test

The fitness of equ. 3 and 4, was determined using the Ramsey Reset Specification. If non-linear combinations of the independent variable (s) has/have any power in explaining the dependent variable, the model is not well specified. However, the reverse is the case where non-linear combinations of the independent variable (s) has/have no power in explaining the dependent variable The p-values as shown in Table 4 are insignificant at 5% level of significance thus equ. 3 and 4 were well specified.

Table 4: Ramsey RESET Test

Equations	F-statistic	Probability
equ. 3	2.740507	0.0628
equ. 4	2.899424	0.0590

Source: Computer Output data using E-views 9.0

4.3 Stationarity Test Result

Augmented Dickey-Fuller (ADF) Test

The Argument Dickey-Fuller (ADF) and Phillips Perron (PP) were the tools for testing stationarity of the variables applied in this paper. Table 5 shows the unit root test at level performed on data at intercept, intercept trend and none while Table 6 depicts data unit root test at first differencing tested at intercept, intercept trend and none. As evidence in Tables 5 and 6, all the variables were not stationary at level but become stationary at first difference thus the data does not have any stationarity defects that may affect our results of estimation.

Table 5: ADF Test Result at Level

Variables	Intercept	Trend and Intercept	None	Remark
GDP	3.52073	0.870757	4.803487	Not Stationary
GR	7 (1.00)	(0.99)	(1.00)	
IIP	-	-	-	Not Stationary
	2.04827	-2.213577	0.168089	
	9 (0.27)	(0.46)	(0.62)	
EDB	2.13248	2.061429	3.689925	Not Stationary
	0 (0.99)	(1.00)	(0.99)	

Source: Computer Output using E-view 9.0.

Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) and (**) denote significance at 1% and 5% respectively.

Table 6: ADF Test Result at First Difference

Variables	Intercept	Trend and Intercept	None	Remark
GDP	-	-	-	Stationary
GR	3.85877	-5.338591	3.247871	
	4	(0.00)*	(0.00)*	
IIP	-	-	-	Stationary
	5.26654	-5.203373	5.366769	
	8	(0.00)*	(0.00)*	
EDB	-	-	-	Stationary
	4.20069	-3.011966	3.328705	
	3	(0.00)*	(0.02)**	

Source: Computer Output using E-view 9.0.

Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) and (**) denote significance at 1% and 5% respectively.

Phillips Perron (PP) Test

The results of the Phillips Perron (PP) stationarity test are shown in Tables 7 and 8. From Table 7, the intercept, intercept trend and none assessment of unit root were determined while Table 8 portrays the first difference stationarity assessment of the data which reveals the data are stationary at first difference. With these tests as disclose in Tables 6 and 8, we are vehemently convinced beyond reasonable doubt that our estimation results is devoid of spurious sentiments that may cast a stain on the output of our regression.

Table 7: PP Test Result at Level

Variab les	Intercept	Trend and Intercept	None	Remark
GDPGR	3.585211 (1.00)	0.932080 (0.990)	4.85397 9 (1.00)	Not Stationary
IIP	-2.091587 (0.24)	-2.199653 (0.47)	- 0.08793 0 (0.65)	Not Stationary
EDB	2.432070 (0.990)	1.856610 (1.00)	4.07956 8 (0.99)	Not Stationary

Source: Computer Output using E-view 9.0.

Note: In determining the truncation lag for PP test, the spectral estimation method selected is Bartlett kernel and Newey-West method for Bandwidth, p-values are in parentheses where (*) and (**) denote significance at 1% and 5% respectively.

Table 8: PP Test Result at First Difference

Varia bles	Intercept	Trend and Intercept	None	Remar k
GDPGR	-3.938303 (0.00)*	-5.336346 (0.00)*	-3.268311 (0.00)*	Stationa ry
IIP	-5.245900 (0.00)*	-5.342936 (0.000)*	-5.380725 (0.00)*	Stationa ry
EDB	-4.160070 (0.00)*	-4.368066 (0.00)*	-3.356365 (0.00)*	Stationa ry

Source: Computer Output using E-view 9.0.

Note: In determining the truncation lag for PP test, the spectral estimation method selected is Bartlett kernel and Newey-West method for Bandwidth, p-values are in parentheses where (*) and (**) denote significance at 1% and 5% respectively.

4.4 Auto-Regressive Distributed Lag (ARDL) Models

The results of the unit root test results unveil that the data have mixed order of integration (see Table 5, 6, 7 and 8). To carefully correct the deficiencies owing to mixed of integration, the ARDL bond test was utilized in ascertaining the nexus between external debt burden and economic growth in Nigeria. From Tables 9 and 10, the F-statistic values of

5.837304 and 9.494295 for external debt burden are greater than the upper and lower bound value of 5.73 and 4.94 respectively at 5% level of significance. The null hypothesis of no long relationship exist is rejected. In this regard, we assert that external debt burden, economic growth and index of industrial production are co-integrated. In other words, there is a long run nexus between external debt burden, economic growth and index of industrial production in Nigeria.

Table 9: Bound Test for GDPGR and EDB

T-Test	5% Critical Value Bound		Implication
F-Statistic	Lower Bound	Upper Bound	
5.837304	4.94	5.73	Null Hypothesis Rejected

Source: Computer output data using E-views 9.0

Table 10: Bound Test for IIP and EDB

T-Test	5% Critical Value Bond		Implication
F-Statistic	Lower Bound	Upper Bound	
9.494295	4.94	5.73	Null Hypothesis Rejected

Source: Computer output data using E-views 9.0

ARDL Error Correction Model

We also estimated the ARDL error correction to enable us determines the speed of adjustment to equilibrium and these are connoted in Tables 11 and 12. For economic growth as entail in Table 11, the error correction coefficient is not correctly signed with the expected negative sign. We infer confidently that there no tendency for equ. 3 to move towards equilibrium following disequilibrium in previous period. Though significant as reveal by the p-value, only 11.76% of error generated in previous period is corrected in current period. For index of industrial production in Table 12, the error correction coefficient shows the a priori negative sign and is statistically significant at 5% level of significance. Thus we unambiguously conclude that equ. 4 has exhibited the tendency to shift towards equilibrium whenever disequilibrium is witnessed in previous years. In elucidate, 57.22% of error from past period is corrected in present period.

Table 11: ARDL Error Correction for GDPGR and EDB

Short Run Co-integration Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDB)	-0.193470	0.646255	0.299372	0.7667
CointEq(-1)	0.117619	0.034331	3.426045	0.0018
Long Run Coefficient				
EDB	1.644887	5.443099	0.302197	0.7646
C	-9829169	11526859	0.852719	0.4006

Source: Computer output data using E-views 9.0

Table 12: ARDL Error Correction for Table 10: Bound Test for IIP and EDB

Short Run Co-integration Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDB)	0.000001	0.000004	-0.128336	0.8990
CointEq(-1)	0.572176	0.132368	-4.322614	0.0002
Long Run Coefficient				
EDB	0.000008	0.000002	3.106205	0.0048
C	121.261278	3.603708	33.649029	0.0000

Source: Computer output data using E-views 9.0

4.5 Ordinary Least Square (OLS) Regression Result Economic Growth and External Debt Burden

The result in Table 13 reveals that external debt burden has a positive but insignificant relationship with economic growth. The coefficient of the constant 14356795 suggests that if external debt burden is held constant, domestic output would be ₦14, 356, 795. The external debt burden coefficient of 3.241813 indicates that a unit increase in external debt burden would result in ₦3.241813 increase in gross domestic product. Put differently, the higher the external debt the higher the gross domestic product of Nigeria. This supports the work of Gabdo and Aminu (2013) and

Onyekwelu, Okoye and Ugwuanyi (2014) that external debt is positively related to gross domestic product of Nigeria. However, is conflicts with the finding of Emerenimi and Anyanwu (2015) and Udeh, Ugwu and Onwuka (2016) on the negative effect of external debt on Nigeria’s economic growth.

Table 13: Ordinary Least Square Regression Result for equ.

Dependent Variable: Economic Growth				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14356795	6390845.	2.246463	0.0317
EDB	3.241813	3.704712	0.875051	0.3881
R-squared	0.023369	Mean dependent var		17929809
Adjusted R-squared	-0.007150	S.D. dependent var		28564964
S.E. of regression	28666906	Akaike info criterion		37.23741
Sum squared resid	2.63E+16	Schwarz criterion		37.32719
Log likelihood	-631.0359	Hannan-Quinn criter.		37.26803
F-statistic	0.765715	Durbin-Watson stat		0.045984
Prob(F-statistic)	0.388067			

Source: Computer output data using E-views 9.0

The coefficient of the Adjusted R-squared in Table 13 reveals that only -0.715% of changes in economic growth was explained by external debt burden. This implies that the trend in external debt burden has not positively explained variation in economic growth in Nigeria during the period covered by this study. F-statistic of 0.765715 as evidence in Table 13 discloses that external debt burden did not statistically explained that changes in economic growth as the p-value is insignificant at 5% level of significance. Durbin Watson (d*) statistic of 0.045984 indicates problem of autocorrelation. However, the problem of autocorrelation was corrected by serial correlation LM test in Table 2.

Index of Industrial Production and External Debt Burden

The result in Table 14 indicates that external debt burden has a significant positive relationship with index of industrial production. The coefficient of the constant 120.6006 means that if external debt burden is kept constant, index of industrial production would be 120.6006 points .The external debt burden coefficient of 6.69E-06 suggests that a percentage

increase in external debt burden would result in 6.69E-06 point's increase in index of industrial production. In other words, the higher the external debt burden the higher the index of industrial production.

Table 14: Ordinary Least Square Regression Result for equ. 4

Dependent Variable: Index of Industrial Production				
Variable	Coefficient t	Std. Error	t-Statistic	Prob.
C	120.6006	2.844363	42.39985	0.0000
EDB	6.69E-06	1.65E-06	4.055291	0.0003
R-squared	0.339462	Mean dependent var		127.9703
Adjusted R-squared	0.318821	S.D. dependent var		15.45884
S.E. of regression	12.75873	Akaike info criterion		7.987332
Sum squared resid	5209.130	Schwarz criterion		8.077118
Log likelihood	-133.7846	Hannan-Quinn criter.		8.017951
F-statistic	16.44539	Durbin-Watson stat		0.811212
Prob(F-statistic)	0.000300			

Source: Computer output data using E-views 9.0

The coefficient of the Adjusted R-squared in Table 14 reveals that only 31.88% of changes in index of industrial production was attributed to external debt burden trend. It would be infer from this result that the external debt burden over the years has not adequately influenced index of industrial production in Nigeria. F-statistic of 16.44539 and p-value of 0.000300 in Table 14 entails that changes in index of industrial production was statistically explained by fluctuation in external debt burden. Durbin Watson (d*) statistic of 0.811212 shows autocorrelation problem. Nevertheless, this problem of autocorrelation was corrected by serial correlation LM test in Table 2.

4.6 Granger Causality Effect Assessments Economic Growth and External Debt Burden

The Granger Causality effect result is presented in Tables 15 and 16. As we can see in Table 15, there is no unidirectional/one way or bidirectional/two way relationship between external debt burden and economic growth as causality does not run from either direction at 5% significance

level. This is to say that external debt burden does not granger cause economic, neither does economic growth granger cause external debt burden. From this result, we assertively state that external debt burden has no significant effect on Nigeria's economic growth over the period reviewed.

This may suggests that most of the fund sourced externally for budget implementation are embezzled or diverted to private accounts of few privileged individuals in positions of authority. This is why many political officer holders who have served their terms of office and are not protected by immunity clause are being detained and arraigned by Economic and Financial Crime Commission (EFCC): the anti-craft agencies established to rid the country off of corruption and portray us in good image to other countries of the world by intelligently investigating embezzlement and diversion of public funds. In the same way, we also identify in Table 16 that external debt burden does not granger cause index of industrial production. Production capacity of industries in Nigeria is not propel by the various external loan sourced by the government over the years. This gives more credit to the reality on ground that Nigeria is very constrained with basic infrastructural facilities to spur production by the manufacturing sector. Manufacturers complain of high cost of running operation using automated gas oil (diesel).

Table 15: Granger Causality for External Debt and Gross Domestic Product

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
EDB does not Granger Cause GDPGR	30	0.04086	0.9600	No Causality
GDPGR does not Granger Cause EDB				No Causality

Source: Computer output data using E-views 9.0

Table 16: Granger Causality for External Debt and Index of Industrial Production

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
EDB does not Granger Cause IIP	30	1.80083	0.1859	No Causality
IIP does not Granger Cause EDB				No Causality

Source: Computer output data using E-views 9.0

V CONCLUSION AND RECOMMENDATIONS

The debt crisis in Nigeria is credited mostly to fiscal policies, exchange and interest rate of the government, and most recently the dwindling revenue from oil (which consist over 90% of government total revenue) occasioned by fall in price of oil in international market. The government has severally pledged to considerably reduce external debt profile, but it is to the astonishment of the citizens, political elites and stakeholders in the economic cycle that the same government is seeking for more loan in the name of financing capital expenditure that will impact on citizens' welfare positively. In this paper, we have empirically shown that our current level of external debt burden has no significant effect on output. The industrial sector which is a pillar to growth and development is worst hit. Exchange rate of our local currency depletes every day against other currency of the world due to the significant amount of foreign exchange used to service debt obligation.

Relying on our estimated results, we are of the opinion that external debts should be contracted solely for economic reasons and not for social or political reasons as currently the case in Nigeria. Politicians, when they get to power, should indulge in people oriented policies rather than policies that will benefit only their political associates. This will help stop the accumulation of arrears, interest and principal payment of funds borrowed. Though external loan is not an evil, but to enhance our industrial performance, industrial led policies should be initiated and implemented. Funds borrowed should be channelled to capital expenditure which improves the manufacturing sector capacity, generates employments and reduced poverty.

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