EFFECT OF EXTERNAL DEBT ON GDP AND EXCHANGE RATE IN NIGERIA, 1986-2018

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ABSTRACT

The recent clamour by Nigerian government for external borrowing has necessitated the investigation of effect of external debt on real GDP and exchange rate in Nigeria. It covered a period of 33 years (1986-2018) and used annual time series secondary data extracted from the Central Bank of Nigeria (CBN) Statistical Bulletin, 2018 edition, and other published materials. Research design adopted was ex-post facto research design. Analytical tools employed was Autoregressive Distributed Lag (ARDL) multiple regression analysis techniques with a battery of diagnostic tests such as Phillips-Perron (PP) unit root test, Pearson correlation, and Jarque-Bera test of goodness-of-fit (normality). The stationarity test established that the variables are of mixed integration of order zero, one and two. However, result of the ARDL revealed that external debt exert negative and insignificant influence on real GDP growth, with a positive and statistically insignificant effect on exchange rate behaviour in Nigeria. The implication of the finding is that increased external borrowing (external debt) retards the growth of real GDP and promotes depreciation of naira in favour of US dollar. In conclusion therefore, external borrowing is not favourable to Nigerian GDP growth and naira appreciation for the period. On this background, it was recommended among other things that Nigerian government should work towards increasing her capital investment horizon internally instead of using borrowed funds to finance the key developmental indices..

1. Introduction

The ongoing controversy generated on the floor of Nigerian legislative house has prompted a critical investigation of the effect of Nigerian external debt burden on real GDP and exchange rate. Nigerian external debt has been on the increase consistently 1958 when a loan of 28 million US dollars was borrowed from the World Bank for railway construction. Since then, the Nigeria's debt profile has been on the rise although has not reached the apex thresholds stipulated by well-meaning international organizations including the IMF's 56% for countries in Nigeria's peer group; a situation that has encouraged government borrowing especially in developing nations. Moreover, despite that total public debt stock is low, there is still the need for increased funding requirements to sustain the economic recovery and this would entail enormous funding resources including borrowing. This is in line with the Economic Recovery and Growth Plan (ERGP) in 2017.

External debt is one of the financing instruments in any economy. Developing countries depend on external debt to finance its projects because of its low savings and low income. To meet the much needed obligations, debt could be a response to a need whether at the level of an individual or nation. Therefore, nations utilize the borrowing option in a bid to meet these obligations; this is how debt is created. Nigeria has witnessed a continuous increase in external debt stocks despite her experience with regard to effects of high interest rates, low savings, weak exchange rates and persistent budget deficits (Abdullahi, Bakar and Hassan, 2015). Debt is an amount of money borrowed by one party from another. It is created by the act of borrowing. According to Kabuoh, Tonade, and Uche, (2014), debt is an obligation owed by one party (the debtor) to a second party, (the creditor) and which is expected to be paid in the future as may be agreed by both parties. It plays both an optimistic and destructive part in forming economic growth, especially in developing nations where such loans may not be put into optimal use. Thus, external debt is a major source of finance usually used in supplementing domestic sources of funds in a bid to support the development process as well as other needs of a country.

Statement of the Problem

The debt problem of Nigeria has reached a frightening dimension threatening to cripple socio-economic and political development in Nigeria, if not urgently addressed. Particularly, external borrowing has contributed to the crawling nature of Nigeria's real GDP and naira devaluation. Huge external debt burden may have related with disincentives to invest, which could have contributed to the relatively poor growth performance of Nigeria in the past. High inflation, persistent depreciation of exchange rate and huge fiscal deficit are other factors suspected to have contributed to this situation (Osuji & Ozurumba, 2013).

The Government deficit financing, foreign exchange and high interest payment according to Melina, Yang and Zanna (2014) makes the external debt less attractive for economic development. Therefore, study of effect of external debt on real GDP and exchange rate should serve as a guide and reveal to the government and other stakeholders the possible dangers and gains especially in developing nations like Nigeria which still has managerial deficiency.

Objectives of the study

1. The broad objective of this study was to investigate the effect of external debt burden on real GDP and exchange rate in Nigeria. The specific objectives were to:
2. Investigate the effect of external debt to real GDP growth in Nigeria.
3. Determine the effect of external debt on exchange rate fluctuations in Nigeria

Research Questions

1. How did external debt affect real GDP growth in Nigeria?
2. How did external debt influence exchange rate behaviour in Nigeria?

Statement of Hypotheses

1. Nigerian external debt had no significant positive effect on real GDP in Nigeria.
2. External debt had no significant positive influence on exchange rate behaviour in Nigeria.

Significance of the Study

The outcome of this study would be relevant to the following groups of people:

Government and Policy Makers

This study will help to educate the government on the need to monitor the macroeconomic indices and as well curtail the level of borrowing at national level.

Researchers and Students

Studies of this nature will help to educate researchers and students on the need to measure the interlinkages between external debt, real GDP and exchange rate in developing countries like Nigeria. It will also serve as reference

materials for further researches on the subject matter or related areas, thereby adding to the available literature, thereby, adding to existing body of knowledge on the subject area.

General Public

The general public will understand the effect of external debt on real GDP and exchange rate in Nigeria. This is because, results from the study will throw up the effect of rising Nigerian external debt profile on real GDP and exchange rate. This will in turn, expand the knowledge of the public on subject matter and guide them in business and investment decisions.

Scope of the Study

This study analyzed the effect of external debt on GDP and exchange rate in Nigeria. It covered from 1986 to 2018. The study used external debt as the independent variable while real GDP and exchange rate were used as dependent variables. The choice of 1986 as the base year is attributable to the introduction of Structural Adjustment Programme (SAP) which brought about the deregulation of the economy in Nigeria. The year 2018 as the upper limit was to ensure currency of data and as well cover the gap created by previous studies in their choice of period of coverage.

Limitations of the Study

This study was constrained in scope as the researcher would have loved to extend the analysis to 2019 but due to unavailability of CBN bulletin for the year 2019 as at the time of analysis, our upper limit was 2018. More so, in coverage, the study was constrained to effect of external debt on GDP and exchange rate in Nigeria, and thus could not extend to other sectors of the economy. However, we were able to resolve all the constraints encountered on this study by sourcing the available data from Central Bank of Nigeria statistical bulletin, and our recommendations could be relied upon on the subject discussed.

2. Conceptual Framework

External Debt

Debt according to Udoka and Ogege (2012) is the resources of money in use in an organization which is not contributed by its owners and does not in any other way belong to them. External debt refers to packages that consist of a mixture of financial, technical vis-a-vis managerial requirements originating from outside the country, aimed at supporting economic growth and development and are repayable at determined future date in foreign currency (Paul, 2017). They are the portion of a country's debts that are borrowed from foreign lenders including commercial banks, governments or international financial institutions. External borrowing can be multilateral or bilateral. It is multilateral when it entails a country borrowing from international organizations like International Monetary Fund (IMF), International Bank for Reconstruction and Development (IBRD) aka World Bank, London Paris Club and other multilateral agencies. But when the borrowing involves a country like Nigeria borrowing from US government it is known as bilateral (government-to-government) debt (Ayadi, 2012).

Exchange Rate

Exchange rate is the worth of a nation's currency in terms of another nation's currency. Exchange rate according to Osundina, Osundina, Jayeoba and Olayinka (2016) is solely determined by market forces instead of the prevailing system whereby monetary authorities intervene periodically in the foreign exchange market in order to attain some strategic objectives. It is an important relative price that influences the external competitiveness of domestic goods.

The exchange rate between two currencies is the rate at which one currency will be exchanged for another. It determines the relative prices of domestic and foreign goods, as well as the strength of external sector participation in the international trade. Ewubare and Merenini (2019), opines that exchange rate is an important macroeconomic variable used as a parameter for determining international competitiveness. It is an indicator of competitiveness of the currency of any economy, and therefore, plays a key role in the broad allocation of production resources and spending in the domestic economy between foreign and domestic goods.

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Gross Domestic Product (GDP)

Asaolu and Ogunmuyiwa (2011) define GDP as the overall income generated from various factors of production, over a period of time in a certain locality. GDP is the largest quantifiable measure of the over-all economic occurrences in a nation. GDP is measured on yearly basis and it comprises all consumption by private and public consumers, government outlays, investments and exports, less imports occurring inside a demarcated borderline. GDP estimates the monetary value of total number of finished goods and services manufactured in a country at a given duration of time.

Inflation Rate

Inflation is the escalation in the rate of prices over a period of time. Inflation according to Muhammad and Naeem (2015) demoralizes investors and also causes a negative effect on the market. It is the pervasive and continuous rise in the aggregate level of prices measured by an index of the cost of various goods and services, occasioned by wars, religious unrest, political instability, poor harvests, environmental upheavals kidnapping and other social malaise. In the work of Oleka (2006), it is the creation of money that visibly raises the prices of goods and lowers the purchasing power of naira. When there is inflation, the currency losses purchasing power (Chude & Chude, 2015).

Theoretical Framework

Keynesian Theory

Keynesian Economic Theory was developed by British Economist John Maynard Keynes in 1936. This theory explains the positive impact of external debt on economic growth. According to the theory, there is government's tendency to finance its budget by external debt which crowds in private investment thereby increasing economic growth. The theory also states that government can reverse economic downturns by borrowing money from the private sector and returning the money to private sector through various efficient spending. This theory believes that active government intervention in the market place through deficit financing is the only means for ensuring growth, stability and efficiency in allocation of resources, regulation of markets, stabilization of the economy and harmonization of social conflicts. Keynes states that in the short run, economic growth through economic stability is strongly influenced by total spending in the economy. The theory however, regards the economy as being inherently unstable and required active government intervention through judicious spending to achieve economic stability.

Dual Gap Theory

The dual-gap theory was propounded by Harrod (1939) and Domar (1946). It is a Post-Keynesian growth models for closed economies. The theory tried to identify the pre-conditions for the economic growth of market economies. These two preconditions are essentially rooted in the Nigerian economy. Generally, the theory provides a framework that development of any nation is a function of investment and that such investment requires domestic savings which is not sufficient to ensure that development takes place (Oloyede, 2005). The argument of the theory is that, investment and development are restricted by level of either domestic savings or import purchase capacity. The dual-gap theory is coined from a national income accounting identity which implies that excess investment expenditure (investment – savings gap) is equivalent to the surplus of imports over exports (foreign exchange gap). Omoruyi (2005) stated that most economies have experienced a shortfall in trying to bridge the gap between the levels of savings and investment and have resorted to external borrowing in order to fill this gap. This gap provides the motive behind external debt as pointed out by (Chenery & Strout, 1996) which is to fulfill the lack of savings and investment in a nation as increases in savings and investment would increase economic growth (Hunt, 2007).

The common understanding of dual gap theory holds that development spills from investment activities and investment in turn depends on domestic savings which most times fall short of the amount required to finance development thereby creating a savings investment gap which brings about borrowing. In the light of this short fall, governments are constrained to adopt the strategy of seeking foreign assistance to augment the domestic effort. The amount sought for is usually equal to the sum that is saved. On a similar note, if the maximum import requirement necessary to realize the growth target is larger than the maximum possible level of export, then there is an export- import exchange gap (Lawal, Bibire, Adegbola and Johnson, 2017).

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The Debt Overhang Theory

This theory was propounded by Krugman in 1988. According to this theory, there is the likelihood that future indebtedness will outgrow the nation's repayment capability such that anticipated servicing cost of the debt will be too high to allow further internal and external investments. Thus, investments will shrink further thereby reducing economic growth.

This work is anchored on this theory (Debt Overhang Theory) because of its relevance to the study of Nigerian external debt which as at 2018 stood at N7.7 trillion and is considered so alarming that if urgent steps are not taken to address it could have devastating effects as both current and future investments may be eroded. Also, as opined by Murungi and Okiro (2018), servicing of debt expenses is likely to deter more internal and external investments.

Empirical Review

Nwanne and Eze (2015) used regression analysis to investigate the relationship between external public debt servicing and receipt and exchange rate fluctuations in Nigeria from 1981 to 2013. The findings of the study showed that external debt receipts and external debt servicing have positive short and long-run relationships with naira exchange rate fluctuations. The study concluded that whereas external public debt receipts affect exchange rate positively, external public debt servicing affects exchange rate negatively.

Saheed, Sani and Idakwoji (2016) examined the impact of public external debt on exchange rate in Nigeria. The secondary data was sourced from the Central bank of Nigeria (CBN) and Debt Management Office (DMO) among other sources and was analyzed using the Ordinary Least Square (OLS). Finding revealed that all the dependent variables, that is external debt, debt service payment and foreign reserve proved to be statistically significant in explaining exchange rate fluctuation in Nigeria within the period of observation, with debt service payment having the strongest effect.

Paul (2017) examined the impact of external debt on economic growth of Nigeria. Ordinary least square regression, ADF unit root test, Johansen cointegration and error correction test was used to analyze the data. Finding revealed that debt service payment has negative and insignificant impact on Nigeria's economic growth while external debt stock has positive and significant effect on Nigeria's growth index.

Eze, Nweke and Atuma (2019) investigated public debts and Nigeria's economic growth for the period 1981-2017. Data was obtained from the Central Bank of Nigeria (CBN) statistical bulletin, volume 28, 2017 on gross domestic product growth (GDP), public investment (LPUINV), external debt (LEXD), domestic debt (LDDs), total public debt (LTPUBT), government expenditure (LGEX), national savings (LNS), consumer price index (CPI) and interest rate (INR) and analyzed using multiple regression analysis, ARDL model and Chow Breakpoint test. The result revealed that external debt has a negative and significant impact on GDP while domestic debt has a negative and insignificant effect on GDP. Similarly, government expenditure has a positive and significant impact on GDP, while national savings and consumer price index have a positive and insignificant effect on LGDP. The result also showed that external debt has a negative and significant impact on LPUINV, while LDD has a positive and insignificant effect on LPUINV. More so, the result showed no evidence of significant structural break between the variables.

In the study of Ademola, Tajudeen and Adewumi (2018) which was focused on the impact of external debt on economic growth in Nigeria for the period of 1999-2015. It was evident with the help of Vector Error Correction Mechanism and Granger Causality test that external debt has an inverse effect on economic growth in Nigeria. In another study by Ogwuche (2019), investigating the relationship between foreign borrowing and economic growth in Nigeria, the Ordinary Least Square (OLS) regression, Johansen cointegration test and Error correction method (ECM) established that external debt burden is an important factor that influences the level of economic growth in Nigeria.

Jimo (2019) employed ordinary least square (OLS) multiple regression and co-integration test to investigate the relationship between external public debt servicing and receipt and exchange rate fluctuations in Nigeria from 1981-2013. The variables used include external public debt receipts, external public debt servicing and the exchange rate.

The finding showed that external debt receipts and external debt servicing have positive short and long-run relationships with the naira exchange rate fluctuations.

Ijirshar, Joseph and Godoo (2016) examined the relationship between external debt and economic growth in Nigeria for the period of 1981-2014. The analysis of unit root was performed on each of the variables incorporated in the model and the result showed that, all the variables were not stationary at level but achieved stationary after first difference at 5% level of significance. The regression results showed a significant relationship between external debt and economic growth in Nigeria. However, external debt stock impacted positively while external debt service impacted negatively on the annual growth rate of the Nigerian economy both in the long run and the short run.

By employing the autoregressive distributed lag technique, Naeem (2015) examined the consequences of public debt for economic growth investment in the Philippines for the period 1975-2010. The result showed that public external debt had a negative and significant impact on economic growth and investment, which confirmed the existence of a debt overhang effect. However, the study could not confirm the existence of crowding out hypothesis since debt servicing revealed insignificant relationships with investment and economic growth in the economy. Also, domestic debt had a negative influence on the investment and positive effect on economic growth.

Aminu, Ahmad and Salihu (2016) investigated the impact of external debt and domestic debt on economic growth in Nigeria from 1976 – 2016. Through the application of Ordinary Least Square (OLS) method to establish a simple relationship between the variables under study: Augmented Dickey – Fuller technique in testing the unit root property of the series and Granger causality test of causation between GDP, external debt and domestic debt was adopted. The results of the unit root suggests that all the variables in the model are stationary and the result of the causality suggests that there is a bi-directional causation between external debt and GDP while no causation existed between domestic debt and GDP as well as no causation existed between external debt and domestic debt. The result of the OLS revealed that external debt has a negative impact on economic growth while domestic debt has a positive impact on economic growth (GDP).

Njokwe (2014) examined the impact of external debt on economic growth in Zimbabwe. The ARDL, ECM econometric approach was applied on the data for the years 1980 – 2012 sourced from the World Bank, World Development Indicators. External debt was found to have a consistent negative and significant impact on GDP growth in the short run and the long-run. External debt servicing was however found to have a positive and significant relationship with GDP growth in the long run. The study confirmed the conventional wisdom that growth in fixed capital formation promotes growth in GDP while trade openness constrains growth.

Okoye, Modebe, Erin and Evbuomwan (2020) examined the effect of external debt on economic growth in Nigeria. Ordinary least squares method was used to analyze the data collected. The robustness of the result was enhanced using the generalized least squares technique. The result showed evidence of significant positive correlation between economic growth and the explanatory variables namely external debt, exchange rate and inflation rate. A negative correlation was however observed between economic growth and gross fixed capital formation. The regression estimates for both the ordinary and generalized least squares tests showed significant positive impact of external debt, exchange rate and inflation rate on economic growth. The results also showed non-significant negative effect of gross fixed capital formation on economic growth.

By employing Autoregressive Distributed Lag (ARDL) Model, Festus and Saibu (2019) examined the effect of external debt on economic growth in Nigeria using time series data on external debt stock, real gross domestic product, trade openness, and gross fixed capital formation as a percentage of GDP as well as data on inflation and exchange rates were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and World Bank indicators from 1981 through 2016. The finding showed that the external debt contribute negatively to growth in Nigeria.

Using a two-step system of Generalized Method of Moment (GMM) techniques, Shuffield, Adelajda and Nyendu (2019) examined external debt and economic growth relationship in a panel of 48 sub-Saharan African (SSA) Countries for the period 1990-2017. Finding showed that contemporaneously, external debt has a negative and statistically significant impact on GDP growth. However, the first leg of external debt variables stimulates GDP growth. The implication is that external debt accumulated in the previous periods makes funds available for growth

enhancing expenditure in the next period. Furthermore, they found no evidence of a non-linear relationship between debt and economic growth. Lastly, they found that the deleterious impact of external debt on GDP growth does not preclude poor or rich SSA countries.

Obayori, Krokeyi, and Kakain (2019) empirically examined the relationship between external debt and economic growth in Nigeria for the periods of 1980-2016. The study used secondary sourced data extracted from CBN statistical bulletin and debt management office fact book. Analytical tool employed was Generalized Method of Moments (GMM) considering the Kwiatkowski, Phillips, Schemidt and Shin (KPSS) unit root test to ascertain the stationarity of the variables. The GMM result revealed a positive and significant relationship between external debt and economic growth in Nigeria.

Benigno (2019) examined debt develeraging and the exchange rate. Develeraging from high debt can provoke deep recession with significant international side effects. Swings in the nominal exchange rate and large variations in consumption, output, and terms of trade can happen during the adjustments. All these movements are inefficient and interesting trade-offs emerge from the perspective of global welfare. The optimal adjustment to global imbalances should not necessarily require large movements in the nominal exchange rate. A global liquidity trap can be desirable when countries are more open to trade.

Empirically, Utomi (2014) investigated the impact of external debt on economic growth in Nigeria for the period 1980-2012. The study used annual time series data on external debt stock and external debt service to capture external debt burden. The techniques of Estimation employed in the study include Augmented Dickey Fuller (ADF) test, Johansen Co-integration, Vector Error Correction Mechanism and Granger Causality Test. The finding revealed an insignificant long run and a bi-directional relationship between external debt and economic growth in Nigeria

Gap in Literature

From the extant empirical literature as reviewed in this study, it has shown that the subject matter has not been porous in Nigeria. To researcher's widest review, most of the studies in the target country were interested on the effect of external debt on GDP growth, only. Little or no attention was paid to other key macroeconomic variables especially the exchange rate which to a great extent determines a country's monetary value in terms of another country.

There is equally gap in data as previous studies could not extend to 2018. This present study used the most recent available data by the Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS) through their statistical bulletin thereby revealing the current situation between Nigeria's external debt burden, real GDP and exchange rate.

3. Methodology

This study adopted the ex-post facto design and used existing (secondary) data that have been collected by the Central Bank of Nigeria (CBN) for the study. Other sources of data include academic Journal articles, textbooks, and internet, which the researcher can neither manipulate nor control. The study used a modified Autoregressive Distributed Lag (ARDL) multiple regression model laid in the works of Njokwe (2014) and Festus and Saibu (2019). ARDL model is generally specified thus:

$$Y_t = \beta_o + \beta_1 Y_{t-1} + \ldots + \beta_p Y_{t-p} + \alpha_o X_t + \alpha_1 X_{t-1} + \ldots + \alpha_q X_{t-q} + \mu_t \qquad - \qquad (3.1)$$

Where,

Y_t	=	*Dependent or Response variable*
X_t	=	*Independent or Explanatory variables.*
β_O	=	*Constant*
$\alpha_o, \alpha_1, \ldots \alpha_q$	=	*Regression parameters or coefficients of the explanatory variables.*

ε_t = *Error term*

In line with the research variables, and explicitly for the specific objectives, the model is specified thus:

For Hypothesis one

$$RGDP_t = \alpha_0 + \beta_1 RGDP_{t-1} + \beta_2 \sum RGDP_{t-i} + \alpha_1 EXTD_t + \alpha_2 EXTD_{t-1} + \alpha_3 \sum EXTD_{t-i}$$

$$+ \varphi_1 INFL_t + \varphi_2 INFL_{t-1} + \varphi_3 \sum INFL_{t-i} + \mu_t \qquad (3.2)$$

For Hypothesis Two

$$EXCR_t = \alpha_0 + \beta_1 EXCR_{t-1} + \beta_2 \sum EXCR_{t-i} + \alpha_1 EXTD_t + \alpha_2 EXTD_{t-1} + \alpha_3 \sum EXTD_{t-i}$$

$$+ \varphi_1 INFL_t + \varphi_2 INFL_{t-1} + \varphi_3 \sum INFL_{t-i} + \mu_t \qquad (3.3)$$

Where,

t	=	time
t-i	=	time lags
α_o	=	Constant

$\beta_i's$ and $\alpha_{i's}$ are the regression coefficients.

μ_t	=	stochastic error term associated with the model.

Apriori expectation: $\alpha_i > 0$

Description of Model Variables

(a) Independent Variable

External Debts (EXTD): External debts are the portion of a country's debts that are borrowed from foreign lenders including commercial banks, governments or international financial institutions.

(b) Dependent Variables

Gross Domestic Product (RGDP): The Real Gross Domestic Product (GDP) is an inflation-adjusted measure that reflects the value of all goods and services produced by an economy in a given year. It is usually expressed in base-year prices often referred to as "constant-price," "inflation-corrected" GDP or "constant dollar GDP."

Exchange Rate (EXCR): This is the worth of a nation's currency in terms of another nation's currency. Exchange rate between two currencies is the rate at which one currency will be exchanged for another.

(c) Moderating Variable

Inflation Rate (INFL): This is the pervasive and continuous rise in the aggregate level of prices in an economy.

Techniques of Data Analysis
Analytical techniques that were used in the data estimation for the study include descriptive statistics and Autoregressive Distributed Lag (ARDL) multiple regression analysis. The analysis was aided by E-views 10.0 econometric package. The analysis observed apriori expectation which is a test of expected sign and magnitude of the explanatory variables. This is to ensure that the interaction among the variables conform to the economic

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theoretical expectation. In order to avoid running a spurious regression analysis, relevant preliminary tests such as unit root and normality tests were carried out.

The stationarity test was performed to ascertain the level at which the dataset were stationary. In other words, where they have constant mean and variance over time and where the value of the covariance between the two time periods depends only on the distance or lag between the two time periods and not the actual time at which the covariance is computed.

Based on non-normality property of the dataset, Phillips-Perron (PP) unit root test approach forms the basis of stationarity test in this study. Following Gujarati (2004) and Wooldridge (2009), the unit root test statistic can be estimated in three various forms:

    i.   Random walk with drift and stochastic trend, estimated by:

$$\Delta y_t = \alpha_0 + \alpha_1 t + \phi y_{t-1} + \sum_{j=1}^{p-1} \beta_j \Delta y_{t-j} + u_t \tag{3.4}$$

    ii.   Random walk with drift, estimated by:

$$\Delta y_t = \alpha_0 + \phi y_{t-1} + \sum_{j=1}^{p-1} \beta_j \Delta y_{t-j} + u_t \tag{3.5}$$

    iii.   Random walk without drift and stochastic trend, estimated by:

$$\Delta y_t = \phi y_{t-1} + \sum_{j=1}^{p-1} \beta_j \Delta y_{t-j} + u_t \tag{3.6}$$

Where,

Δ	=	Is the difference operator
ϕy_{t-1}	=	$(Y_{t-1} - Y_{t-2})$ is the first difference,
ϕy_{t-1}	=	$(Y_{t-2} - Y_{t-3})$ is the second difference, and so on
U_t and V_t	=	Random terms
t	=	Linear trend

In equation (3.4), there is both the intercept term and the deterministic trend. The constant term is excluded in equation (3.5), while in equation (3.6), both the intercept term and the deterministic trend was excluded. The null hypothesis H_0: $\phi=0$ versus the alternative H_1:$\phi<0$. If the ADF test statistic is more negative than 1%, 5% and 10% critical values, the ADF test null hypothesis of a unit root is accepted.

Also, normality test was performed to ascertain whether the dataset are normally spread out over the period. Particularly, the Jarque and Bera (1987) goodness of fit test procedure was employed. More so, the distribution tails (skewness) and peakedness (kurtosis) were estimated. The quantity K(x) – 3 is called the excess kurtosis because K(x) = 3 for a normal distribution. In addition, to check if there exists first order serial correlation in the model, the autocorrelation statistics was computed using the Durbin-Watson (D-W) statistic

4. Presentation of Data and Analysis

Table 1: Annualized time series data of EXTD, RGDP, EXCR, and INFL

YEARS	EXTD (N'B)	RGDP (N'B)	EXCR (N1/USD)	INFL (%)
1986	41.45	15237.99	2.0206	5.4
1987	100.79	15263.93	4.0179	10.2
1988	133.96	16215.37	4.5367	56
1989	240.39	17294.68	7.3916	50.5
1990	298.61	19305.63	8.0378	7.5
1991	328.45	19199.06	9.9095	12.7
1992	544.26	19620.19	17.2984	44.8
1993	633.14	19927.99	22.0511	57.2
1994	648.81	19979.12	21.8861	57
1995	716.87	20353.20	21.8861	72.8
1996	617.32	21177.92	21.8861	29.3
1997	595.93	21789.10	21.8861	10.7
1998	633.02	22332.87	21.8861	7.9
1999	2,577.37	22449.41	92.6934	6.6
2000	3,097.38	23688.28	102.1052	6.9
2001	3,176.29	25267.54	111.9433	18.9
2002	3,932.88	28957.71	120.9702	12.9
2003	4,478.33	31709.45	129.3565	14
2004	4,890.27	35020.55	133.5004	15
2005	2,695.07	37474.95	132.1470	17.8
2006	451.46	39995.50	128.6516	8.2
2007	438.89	42922.41	125.8331	5.4
2008	523.25	46012.52	118.5669	11.6
2009	590.44	49856.10	148.8802	12.4
2010	689.84	54612.26	150.2980	13.3
2011	896.85	57511.04	153.8616	10.9
2012	1,026.90	59929.89	157.4994	12.2
2013	1,387.33	63218.72	157.3112	8.5
2014	1,631.52	67152.79	158.5526	8.0
2015	2,111.53	69023.93	193.2792	9.5
2016	3,478.92	67931.24	253.4923	15.7
2017	5,787.51	68490.98	305.7901	16.5
2018	7,759.20	69810.02	306.0802	12.1

Source: CBN statistical Bulletin, 2018

Data Analysis
Table 2: Descriptive Statistics Result

VARIABLES	MEAN	STD. DEV.	SKEWNESS	KURTOSIS	J-B STAT.
EXTD	1731.95	1898.14	1.48	4.58	15.53
RGDP	36628.25	19418.58	0.57	1.76	3.88
EXCR	101.99	86.02	0.66	2.89	2.40
INFL	19.95	18.40	1.61	4.18	16.09

Source: Researcher's computation using Eviews 10 package

The descriptive statistics result in table 2 above shows that the series of the study variables are volatile (with high standard deviations). They are all clustered on the right tail of the distribution. The Kurtosis statistics for RGDP and EXCR lies below 3.00, hence they do not have excess kurtosis. However, the series of EXTD and INFL with kurtosis (k>3.00) have excess kurtosis, an indication that they are leptokurtic. The Jarque-Bera (JB) goodness of fit estimate confirmed that the series of EXTD and INFL with JB probability values less than 0.05 shows that they do not follow normal or smooth distribution.

Table 3   Result of Phillips-Perron (PP) unit root test

VARIABLE	PP-STAT	CRITICAL VALUES @5%	P-VALUE	ORDER OF INTEGRATION	INFERENCE
LN(EXTD)	-4.11	-2.96**	0.0033	I(1)	Stationary
LN(EXCR)	-3.02	-2.96**	0.0433	I(0)	Stationary
LN(RGDP)	-3.11	-2.96**	0.0358	I(1)	Stationary
LN(INFL)	-7.15	-3.56**	0.0000	I(1)	Stationary

** Indicates stationary at 5% level of significance
Source: Author's Extract from E-views 10 Result

The stationarity test result in table 3 above indicates that there is a mixed integration of order zero (I(0), and order one (I(1), among the variables. Particularly, exchange rate (EXCR) was stationary at level form, while real GDP (RGDP), external debt (EXTD), and Inflation rate (INFL) were stationary at first differencing.
Since, the ARDL model is applicable when (1) all variables are I(1), and (2) when we have a mixture of I(1) and I(0) variables. This flexible/dynamic model is therefore employed in testing the research hypotheses. Before the hypotheses testing, the variables were subjected to multicollinearity test using Pearson correlation approach. The result is as shown in table 4 below.
Hypotheses Testing

Hypothesis One

Ho: Nigerian external debt had no significant effect on real GDP in Nigeria.

Ha: Nigerian external debt had significant effect on real GDP in Nigeria.

Level of significance (α) = 0.05
Decision rule: Reject the null hypothesis if the p-value is less than 0.05 otherwise, do not reject

Table 4: Result of effect of LEXTD on LRGDP in Nigeria

DEPENDENT VARIABLE: LRGDP				
METHOD: ARDL				
SAMPLE (ADJUSTED): 1990 2018				
INCLUDED OBSERVATIONS: 29 AFTER ADJUSTMENTS				
MODEL SELECTION METHOD: AKAIKE INFO CRITERION (AIC)				
DYNAMIC REGRESSORS (4 LAGS, AUTOMATIC): LEXTD LINFL				
FIXED REGRESSORS: C				
NUMBER OF MODELS EVALUATED: 100				
SELECTED MODEL: ARDL(2, 0, 4)				
VARIABLE	Coefficient	Std. Error	t-Statistic	Prob.*
C	0.508243	0.173913	2.922391	0.0084
LRGDP(-2)	-0.491098	0.159909	-3.071112	0.0060
LEXTD	-0.001291	0.005537	-0.233179	0.8180
LINFL(-4)	-0.017602	0.009355	-1.881684	0.0745
R-SQUARED	0.998393			
ADJUSTED R-SQUARED	0.997750			
F-STATISTIC	1552.868			
PROB(F-STATISTIC)	0.000000			
DURBIN-WATSON STAT	2.214607			
LONG-RUN BOUND TEST ESTIMATE				
F-STATISTIC = 3.04				
LOWER BOUND (I(0)) = 3.10				
UPPER BOUND (I(1)) = 3.87				

Source: Author's extract from Eviews 10 Result

The ARDL (2, 0, 4) result above shows that using Akaike information selection Criterion, external debt (LEXTD) at lag zero with a coefficient value of −0.0013, t-statistic value of −0.2332 and associated probability value of 0.8180 > 0.05 has insignificant negative effect on GDP growth in Nigeria. However, the researcher upholds the null hypothesis. The inflation rate (at lag 4) though used as a control variable equally has insignificant negative long-run effect on real GDP growth in Nigeria. The F-statistics with probability value of 0.0000<0.05 indicates a joint significant effect of the explanatory and moderating variable on RGDP growth for the period of study.

The R^2 estimate of 0.998 indicates that the model is a good one since about 99.8% of the total variations in Nigeria real GDP growth can be explained by the country's external debt burden. Only 0.2% of the total variations are unexplained hence are due to other relevant variables not present in the model. The Adjusted R-squared value of 0.997 (99.7%) indicates that there is no much variations after been adjusted for degrees of freedom.

The Durbin-Watson statistic value of 2.214607 following the rule of thumb indicates that the model is free from first order autocorrelation problem. The ARDL bound test result with F-stat. = 3.04, Lower bound estimate I(0) = 3.10, and Upper bound estimate I(1) = 3.87 indicates that there is no long-run equilibrium relationship between external debt and the growth of real Gross Domestic Product (RGDP) in Nigeria.

Hypothesis Two
Ho: External debt had no significant influence on exchange rate behaviour in Nigeria.
Ha: External debt had significant influence on exchange rate behaviour in Nigeria.
Level of significance (α) = 0.05
Decision rule: Reject the null hypothesis if the p-value is less than 0.05 otherwise, do not reject.

Table 6: Result of effect of LEXTD on LEXCR in Nigeria

DEPENDENT VARIABLE: LEXCR	
METHOD: ARDL	
SAMPLE (ADJUSTED): 1990 2018	
INCLUDED OBSERVATIONS: 29 AFTER ADJUSTMENTS	
MODEL SELECTION METHOD: AKAIKE INFO CRITERION (AIC)	
DYNAMIC REGRESSORS (4 LAGS, AUTOMATIC): LEXTD LINFL	
FIXED REGRESSORS: C	
NUMBER OF MODELS EVALUATED: 100	
SELECTED MODEL: ARDL(4, 2, 2)	
VARIABLE	**Coefficient**
C	1.160598
LEXCR(-4)	0.294693
LEXTD(-2)	0.114255
LINFL(-2)	-0.306293
R-SQUARED	0.983620
ADJUSTED R-SQUARED	0.974520
F-STATISTIC	108.0911
PROB(F-STATISTIC)	0.000000
DURBIN-WATSON STAT	2.323001
LONG-RUN BOUND TEST ESTIMATE	
F-STATISTIC VALUE	8.70
LOWER BOUND VALUE	3.10
UPPER BOUND VALUE	3.87

Source: Author's extract from Eviews 10 Result

The ARDL (4, 2, 2) result above shows that using Akaike information selection criterion, external debt (LEXTD) at lag 2 with a coefficient value of 0.1143, t-statistic value of 1.1566 and associated probability value of 0.2626 > 0.05 has positive but insignificant effect on exchange rate behaviour in Nigeria. However, the researcher upholds the null hypothesis. The inflation rate at lag 4 (control variable) has negative and significant long-run effect on exchange rate behaviour in Nigeria. The F-statistics (F=108.0911) with associated probability value of 0.0000<0.05 indicates a joint significant effect of the explanatory and moderating variable on exchange rate behaviour for the period of study.

The R2 estimate of 0.983 indicates that the model is a good one since about 98.3% of the total variations in Nigeria exchange rate fluctuation can be explained by the country's external debt burden. The unexplained 1.7% of the total variations can be attributed to other relevant variables not present in the model. The Adjusted R-squared value of 0.975 (97.5%) indicates that there is no much variations after adjusting for degrees of freedom.

The Durbin-Watson statistic value of 2.323001 following the rule of thumb indicates that the model is free from first order autocorrelation problem.

More so, the ARDL long-run bound test with F-statistic value of 8.70, Lower bound (I(0)) estimate of 3.10, and Upper bound (I(1)) estimate of 3.87, indicates that there is a long-run equilibrium relationship between external debt and exchange rate behaviour (LEXCR) in Nigeria. This finding lay to encourage the work of Jimoh (2019), Ogbu (2019), amongst other studies. It disobeys the work of Okoli (2014), amongst other studies.

Summary of Findings
Empirical findings of this study revealed that:
1. External debt had insignificant negative effect on real GDP growth in Nigeria.
2. External debt exerted insignificant positive effect on exchange rate behaviour in Nigeria.

Conclusion

This study empirically examined the effect of external debt on real GDP and exchange rate in Nigeria. Using the Autoregressive Distributed Lag (ARDL), the emerging lesson was that external borrowing is not favourable to the growth of Nigerian economy. This confirmed the existence of debt overhang effect of external debt on GDP and exchange rate in Nigeria. The implication is that, if consistent borrowing is not curbed in Nigeria, the economic growth will be hindered with unfavourable exchange rate.

Recommendations

Based on the findings above, the study recommended the following:

1. The government of Nigeria should play down on external borrowing, make judicious use of the borrowed funds and avoid looting and diversion of the funds into personal uses and non-desired areas.
2. Government of Nigeria should encourage export of goods and services especially non-oil and agricultural products so as to increase her foreign exchange earnings.
3. Nigerian government should encourage local productions, ensure good and adequate infrastructure and place moderate restrictions on imported products.

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