

EXTERNAL DEBT AND NIGERIA'S REAL ECONOMY

By

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Abstract

In recent times, there have been several agitations by stakeholders on the increasing level of Nigeria's external debt while her real economic growth (RGDP) has remained sluggish and suboptimal. Global attempts to validate the relationship between external debt and RGDP by economic scholars have also generated mixed results. It is therefore pertinent for this study to reexamine the problem empirically and holistically. The study applied co-integration procedures, unit root test, error correction model, and Granger causality test, using time series data sourced from CBN, spanning from 1980 to 2020. The empirical finding demonstrates that external debt, external debt interest charges and foreign exchange rate are adversely affecting the growth of the real economy. The study recommends measures to ensure that borrowed funds are spent on projects they are tied to. Furthermore, policy makers should take cognizance of policy lag effect, which was also uncovered in the study, and select policies in line with the expected magnitude of expected changes.

Keywords: external debt, exchange rate, real economy, co-integration, error correction model

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Introduction

In recent times, the increasing nature of Nigeria's external debt has generated a lot of agitations among the stakeholders and the public in general as the performance of her real economy has remained sluggish and suboptimal. The analysis of Nigeria's huge debt cannot be detached from its decades of maladministration and corruption as the continued recklessness of her political rulers has come to a limelight of the public. (Imimole, et al., 2014). In addition, there is a general belief that the problem of unrevealing debt servicing charges and the insatiable quest of her political leaders to obtain more loans which are usually not utilized for the projects they are tied to, have contributed to the sluggish growth of the real economy. The inefficient management of the huge debt has become a big challenge to the country especially in terms of its servicing, leaving the economy with little or nothing to perform her constitutional obligations to the citizenry (Safdari, 2011). Prior to the \$18 billion debt cancellation granted to Nigeria in 2005 by the Paris Club, the country's external debt was close to \$40 billion with over \$30 billion of the amount being owed to Paris Club alone (Safdari, (2011). Before the debt cancellation deal, Nigeria was to pay a monstrous sum of \$4.9 billion every year on debt servicing (Aluko & Arowolo, (2010) (CBN (2010).. Under such indebtedness, there is no way that the exchange rate instability would

not have worsened as well as the growth rate of the economy, since any debt obtained has to be serviced and repaid in the foreign currency in the long run which is at the expense of the local currency (Onwuka & Igweze, (2014). Paris Club debt cancellation was immediately observed in the sequential reduction of the exchange rate of Nigeria vis-a-vis the Dollar from 132.1 Naira in 2005 to 128.6 Naira in 2006, 125.8 Naira in 2007 and then 118.5 in 2008. Available statistics show that the external debt stock of Nigeria has been on the increase after the debt cancellation in 2005.

External debt management involves a conscious and carefully planned schedule for the acquisition and retirement of foreign loans contracted either for development purposes or to support the balance of payments, executed under an established condition of issue and redemption of the foreign loans. It also involves management of the proceeds of administering the external debt by providing for the payment of the interest charges on debt and arranging for the refinancing at the maturity of the debt (Ephrami 2002). It also includes an assessment of the country's capacity to service existing debts and a judgment on the desirability of contracting loans. (CBN, 1996, Ezeanyej and Okeke. (2016). For any economy to benefit from any loan, whether external or domestic, it must be administered effectively and efficiently (Adeyemi 2020). According to Hameed, et al., (2008) on standard "growth with debt", a country should borrow externally provided the principal capital acquired yields a rate of return that is higher than the cost of the external borrowing. In that event, the borrowing country is increasing her production capacity with the aid of the external debt. The debt, if efficiently utilized, is expected to provide a sustainable growth to the real economy. But, this has not been the case in Nigeria and several other Sub-Saharan African Countries, where it has been grossly misused (Aluko & Arowolo, 2010).

This study has noted that many economic scholars and practitioners are of the view that the relationship between external debt and growth in Nigeria has not been adequately identified. (Ezeanyej and Okeke 2016). This has become a subject of controversy among many scholars. Some were of the view that external debt can accelerate economic growth (Hameed, Ashraf and Chandhary 2008). This view is tandem with the neoclassic model of economic growth, which is the Keynesian theory in which capital accumulation is viewed as catalyst to economic growth. (Amini, Oushehi, Ahranjani and Amini, (2012). On the other hand, the proponent of negative impact of external debt on economic growth are of the opinion that at a certain level, debt accumulation becomes a burden and will no longer stimulate growth (Elbadawi, Ndungu and Ndulu 1996). In addition, the liquidity constraint referred to as "crowding out effect" of debt which is the servicing charges reduces the fund which could have been used for expanding the

production capacity, and ultimately investment and growth of the real economy. From the foregoing, there is clear observation that there are a divergent views on the impact of external debt on economic growth which calls for further empirical investigation (Ezeanyeji and Okeke, 2016).

Additionally, Debt to GDP ratio, measures the financial leverage of any economy. One of the Euro convergence criteria was that government debt to GDP ratio should be below 60%. If higher, it denotes the country's risk of default, which could cause financial panic in the domestic and international market. It could also be interpreted as the number of years it would take the country to pay back its debt if GDP was used for repayment. The higher the ratio, the less likely the country will pay back its debt (World Bank 2020). Therefore, efficient management of debt should not exceed 60% while the ratio of service charge to GDP should be between 20 to 25 per cent maximum. (Omoruyi, 1996 and World Bank 2020). Nigeria's Debt to GDP ratio, as well as debt service charge to GDP ratio have been well above these globally accepted benchmarks in recent years (CBN 2020). The huge level of external debt and its interest charges have already become a challenge to the economic planners as the the government obligations to the citizenry could not be met. (Alao, 2010). The huge amount paid as interest charges could have been used to develop domestic investment, which would have enhanced economic growth and stabilize her exchange rate (Imimole, et al., 2014; Darma, 2014).

In addition, although the naira exchange rate witnessed some period of relative calm after the Paris Club debt cancellation in 2005, its persistent depreciation after the implementation of SAP in 1986 decay the performance of the real sector, which was under capital supply constraint due to the burden of external debt servicing. Regrettably, past analysis of developments in some external debt of some developing economies (Nigeria inclusive) had been largely devoid of in-depth empirical analysis. (Akinlo and Yinusa, 2007).

Recognizing the above gaps and challenges, there is need to reexamine these problems holistically by updating the number of observations of the study to 2020, using Nigerian time series and applying the realistic econometric techniques (unit root test, co-integration, error correction model, and Granger Causality test), to see if a more authentic result could be achieved for effective policy planning and implementation.

Review of Related Literature

Theoretical Underpinning

The Keynesian theory of capital accumulation laid emphasis on the increasing capital accumulation through government intervention which is said to accelerate growth. This theory is

named after the British Economist John Maynard Keynes. Keynes and other monetarists argue that during recession, aggregate demand would be affected by the government applying monetary and fiscal policies through reduction of monetary policy interest rate and reduction of investment on infrastructural development. They believe that reduction in interest rate will encourage commercial banks to increase and meet their customers loan demands while reduction of infrastructural development will cause a decrease of external debt (capital). By implication, Keynes theory support that external debt which is a source of capital accumulation can act as a catalyst to economic growth by utilizing the external debt to increase economic activities within the economy. (Jhingan (2004).

Ricardo's theory in relation to public debt stresses that financing government expenditure out of current taxes or future taxes (and current deficits) will have equivalent effects on the overall economy. Smith and Ricardo opposed public borrowing. In their view, borrowing can be spent irresponsibly because it is an easy income the requisite funds needed to sustain the economy would ultimately have to be drawn from the liquid resources of the community and that it would not make much difference whether such funds were raised by taxes or by loans. However, where the funds were raised through loans or debt, it would be referred to as public debt which could be external or internal. External debt requires debt interest payment; both the principal amount and interest element are paid in foreign currency. The continued increase or decrease in demand for foreign currency tends to influence the exchange rate of the borrowing country. Jhingan (2004)

Another old threshold school of thought, led by Calvo (1998) stressed on the non-linearity relationship between debt and growth. It links debt and growth to problem of capital flight where at high debt levels, the growth rate would decrease According to the threshold theory, the decrease in growth rate is due to the higher distortionary tax burden on capital required to service the debt. It leads to lower rate of return on capital, lower investment and hence lower growth. The theory maintains that low debt and efficient management of debt leads to higher growth rate. (Jhingan, 2004, Calvo, 1998).

On the other hand, external debt is also seen as capital inflow with positive effect on domestic savings and investment and ultimately, on growth (Calvo, 1998).

Review of Nigeria's External Debt Stock

The origin of Nigeria's external debt could be traced back to 1958 when the country first contracted the sum of US\$28.0 million for railway construction and the accumulation of short-term trade arrears in 1982 and 1983. These instruments were reconciled and accepted as public debt some years later, and contributed substantially to the external debt stock. Since then a number of external debts have been contracted. The Debt Management Office was established in 2000 to

enhance effective management of debt based on the persistent increase in external debt and yet, economic growth has remained sluggish and suboptimal without showing much effect of the external debt within the economy. (Sanusi 2003)

The Nigeria's external debt are basically from multilateral agencies like Paris Club of Creditors, London Club of Creditors, Promissory Note Holders, Bilateral and Private Sector Creditors and other sources (Salawu 2005). According to Debt Management Office (2011, 2012, 2013) following a recession in 1977/78, Nigeria raised the first (US\$1b) US Dollar one billion loan known as Jombo loan from International Capital market to finance infrastructural projects

The country experienced considerable difficulties in meeting its scheduled external debt service obligations during most of the period preceding the Paris Club "Debt Relief Deal" in 2005. Prior to the Paris and the London Club of Creditors' debt exit, external debt stock which stood at US\$35.9 billion in 2004 declined to US\$3.5 billion in 2006, resulting to debt and the debt service to GDP ratios of 2.4 per cent and 1.5 per cent, respectively. These ratios declined further to 1.9 per cent and 0.5 per cent, respectively, in 2007. The sharp decline resulted from the significant Paris Club debt cancellation and repayments. Owing to Federal Government draw down on multilateral loans Nigeria external debt grew from US\$3.9 billion in 2009 to US\$4.6 billion and US\$5.7 billion in 2010 and 2011, respectively. However, the stock of external debt grew by 10.4 percent between 2014 and 2015 to US\$10.72 billion (CBN, 2015 and Mordi et al, 2013).

As at December, 31st 2020, the external debt stock was US\$4.billion and 36.60 percent of her Public debt which stood at N32.71 trillion, was external (CBN 2020). The adverse cumulative effect was a sharp rise in the external debt service burden on an economy that had significant deficit financing budget with increasing cost of servicing those debts and the improper direction of the foreign loans to non-productive sector of the economy (CBN, 2020).

Economic Growth

The framework for understanding growth over the long-term is rooted in two main theories that relate to possible sources of growth. These are the growth theory and the growth accounting. Growth theory is concerned with the theoretical modeling of the interactions among growth of factor supplies, saving and capital formation, while growth accounting addresses the qualification of the contributions of the different determinants of growth.

Three waves of interest have currently emerged in studying growth. The first wave is associated with the work of Sir F. Harrods (1900-1978) and E. Domar (1914-1997) in what was termed the "Harrods – Domar Model". The theory presupposed that growth depended on a country's savings rate, capital/output ratio, and capital depreciation. This theory has been criticized for three reasons. Firstly, it centers on the assumption of ergogeneity for all key parameters. Secondly, it

ignores technical change, and lastly, it does not allow for diminishing returns when one factor expands relative to another (Essien 2005).

The second began with the neoclassical (Solow) model, which contained the thinking that growth reflected technical progress and key inputs, (labour and capital). It allowed for diminishing returns, perfect competition but not externalities. In the neoclassical growth process, savings were needed to increase capital stock, capital accumulation had limits to ensure diminishing marginal returns, and capital per unit of labour was limited. It postulates that growth also depended on population growth rate and that growth rate amongst countries was supposed to converge to a steady state in the long-run. Despite the modifications, the basic problems associated with the neoclassical thinking are that it hardly explains the sources of technical change.

The third is the newer alternative growth theory, which embraces a diverse body of theoretical and empirical work that emerged in the 1980s. This is the endogenous growth model. It distinguished itself from the neoclassical growth model by emphasizing that economic growth was an outcome of an economic system, not the result of forces that impinged from outside. Its central idea was that the proximate causes of economic growth were the effort to economize, the accumulation of knowledge, and the accumulation of capital. According to this theory, anything that enhances economic efficiency is also good for growth. Thus the theoretical framework indigenized technological process through “learning by doing” or “innovation processes”. It also introduced human capital, governance and institutions in the overall growth objectives (Romers, 1994 and Essien, 2005).

The model further incorporates the fact that technological advancement comes from what people do and existence of monopoly rents discoveries. The emphasis on knowledge and technology in the Schumpeterian model raises question about the role of government in promoting growth. (Schumpeter emphasized the importance of temporary monopoly power as a motivating force in the innovative process). Government should be seen as a critical agent that provides key intermediate inputs, establishes rules, and reduces uncertainty, by creating the right macroeconomic environment for growth. (Contessi and Weignberger 2009).

The newer growth theory (endogenous theory) fits the real world perfectly well and has important policy implications. This is because it traces growth of output per capita to two main sources: savings, capital and efficiency. In other words it is not only factor accumulation that drives growth but also efforts to utilize them efficiently. An important economic policy implication of this thinking is that of achieving sustainable economic growth and stability with efficient management of debt (capital). (Patillo et al 2004, Momodu 2012). Consequently, anything that increases efficiency, capital and savings is good for growth.

Empirical Literature Review.

There are some divergent findings from empirical studies reviewed. However, the findings depend on the economic structures of the economies studied by researchers in addition to methods of analysis applied.

Patillo, Helen and Luca (2004) investigated the channels through which external debt can affect economic growth (total factor accumulation or factor productivity growth); and also tested the non-linearity relationship with different sources of growth for developing economies covering a period of . The study established that external debt had significant and negative impact on physical capital formation of the economies studied.

Kasidi and Said (2013) in their study on the impact of external debt on economic growth in Tanzania covering a period 1990 to 2010, established that external debt had a significant positive effect on Tanzania's economic growth. while debt serving charges had a significant negative effect.

Atique and Malik (2012) in their study on effect of public debt on economic growth of Pakistan, using OLS covering a period 1980 to 2010, confirmed that both external and domestic debt affected growth adversely.

Amooteng and Amaoko (1996) in their study examined the relationship between external debt and economic growth in 35 African countries, using Granger causality analysis. The result showed that unidirectional causal relationship existed between growth and external debt

Sulaiman and Azeez (2012) in their study on the effect of external debt on the economic growth of Nigeria, covering period from 1970-2010, applying (OLS), Augmented Dickey-Fuller unit root test, Johansen Co-integration test and error correction method, established that long-run relationship existed among the variables. The result confirmed that external debt has contributed positively to the growth of the Nigerian economy while exchange rate, with significant positive relationship, implied high depreciation of Naira. Adeyemi (2020) in his study titled External Debt and Economic growth in Nigeria: An Implication for Debt Overhang Theory, established that external debt, exchange rate and debt interest charges contributed significantly to the sluggish growth of the economy. Ogege and Ekpudu (2010) tested the relationship between debt burden and the growth of the Nigerian economy. The result revealed a significant negative relationship between debt stock and Gross Domestic Products, while exchange rate with significant positive relationship, indicated high depreciation of the domestic currency. Ijeoma (2013), investigated the impact of external debt stock, external debt service charges and exchange rate on selected macroeconomic variables (Gross Domestic Product and gross capital formation). The result showed that exchange rate external debt shock, external debt service charges adversely affected

and the nation's economic growth. Udeh, Ugwu and Onwuka (2016) in their study titled external Debt and Economic Growth: The Nigerian Experience, investigated the effect of external debt on Nigeria's economic growth, between 1980 to 2013, applying, unit root test, cointegration, and error correction model. The study established that in the short run, external debt has positive relation and with GDP while in the long run external debt, external debt interest charges and exchange have adverse effect on GDP. Ajayi and Oke (2012) investigated the effect of external debt burden on the economic growth and development of Nigeria, using the regression analysis OLS. They found that external debt burden had an adverse effect on the growth of the economy.

Estimation Technique and Procedure

The study applied econometric analytical techniques based on co-integration, unit root test and Error correction mechanism (ECM) and Granger causality test for the data analysis while secondary data time series used is obtained from CBN Statistical Bulletin, Debt Management Office, and CBN Annual Reports and Statement of Accounts various issues, spanning from 1981 to 2020 for the purpose of arriving at a dependable and unbiased analysis.

Prior to testing for long-run relationship using co-integration test, Augmented Dickey Fuller (ADF) (1981) unit root test was carried out to check the stationary property of the variables (if any) in the model. The Unit root test was to establish if the time series had a stationary trend, and, if non-stationary, to show the order of integration through 'differencing'. A time series is stationary if its means, variance and auto-variance are not time- dependent. (Gujarati and Porters 2009). The assumption is that the time series used for this research have unit root stochastic process. The process could be represented as follows:

$$\Delta Y_t = \beta_0 + \beta_1 t + \lambda Y_{t-1} + \sum_{i=1}^m \alpha_i \Delta Y_{t-i} + \xi_t \dots \quad (1)$$

where Y is the single time series for (External debt, external debt interest charge and nominal foreign exchange rate) under investigation and β the parameter coefficient, ξ_t is a pure white noise error term, α_i and λ are coefficients of the lag terms and m is the length of the lag terms which is automatically selected using Akaike information criteria. If ' λ ' is 0, then there is unit root, but if it is less than zero (negative), the null hypothesis is rejected and the alternative that the series is stationary is accepted.

Capitalizing on the likelihood of the co-movement in their behavior which implies that there is possibility that they trend together towards stable long run equilibrium, Johansen (1991) Co-

integration test was applied. The objective of this test is to determine if there is existence of long-run equilibrium relationships among variables used in this research. As pointed out by Engle and Granger (1987), the concept of co-integration creates a link between integrated process and the concept of steady state of equilibrium. Co-integration occurs when two or more time series variables which themselves may be non-stationary, drift together at roughly the same time. This implies that a linear combination of the variables is stationary. The null hypothesis is that the variables are not co-integrated. Based on this, we specify the full information maximum likelihood based on the vector autoregressive equation (VAR) Johansen (1991) as mathematically stated below:

$$y_t = a_1 y_{t-1} + \dots + a_k y_{t-k} + \phi x_t + \mu_t \dots \quad (2)$$

where: y_t is a k -vector of 'differenced' stationary time series, ' k ' being the lag length for the first order differenced variables, $I(1)$, ' x_t ' is a vector of deterministic variables, ' a ' is a constant, ϕ are the coefficient of the deterministic variables and μ_t is a vector of innovations or error term and it is known as the adjustment parameters in the vector error correction model, while " t " indicates time dependent.

Using this method we estimated the equation in an unrestricted form and then tested whether we can reject the restriction implied by the residual rank of the co-integration.

Applying the maximal non-zero eigen-values and the trace test of the maximum likelihood ratio, with reference to the level of significance, the number of Co-integration relations could be determined which indicate the existence of long run relationship (Johansen 1991).

However, Co-integration process ignores the short run dynamics that might cause a relation not to hold in the short run and this formed the basis for application of Error Correction Mechanism (ECM). ECM is an extension of the partial adjustment model in co-integration technique which is the traditional approach to modeling of short run dynamics with long run equilibrium. It thus preserves the long run relationship while specifying the system in a short run dynamic way. Granger and Newbold (1974), and Engle and Granger (1987) are among the studies that have proved that a co-integration is a sufficient condition to run an ECM process.

A vector error correction model is a restricted VAR (Vector auto-regression) that has co-integration restriction built into the specification so that it is designed for use with non-stationary error correction term, since the deviation from the long equilibrium is corrected gradually through series of partial short-adjustment (Gujarati and Porters 2009).

A search for parsimony in this dynamic model typically follows the general-to-specific modeling (using various information criteria (Akaike, Schwarz, log likelihood, etc) which minimizes the possibility of estimating relationship while retaining long-run information, if the variables do not

have the same order of integration, (Engel and Granger (1987)). The functional form of the model, which initially is presented in a general form, incorporating many lag terms, is therefore later reduced to a specific or parsimonious structure by empirical testing and elimination and this gives the final and more precise result of the estimation.

Based on this, the specification is re-parameterized in a dynamic process and OLS regression applied with the equation as shown below:

$$RGDP_t = a_0 + \sum_{i=1}^n a_i RGDP_{t-1} + \sum_{i=0}^n a_i Z_{t-1} + a_i ecmt_{-1} + \mu \dots \dots \dots (3)$$

Where a_0 is a constant, $RGDP_t$ is a vector of endogenous variable and dependent variable, Z_{t-1} is lag term of a vector of explanatory variables as already explained and a_i is the parameter coefficients, $RGDP_{t-1}$ is the lag term of the dependent variable, the $ecmt_{-1}$ or error correction term is the residuals from the long-run co-integration process and its coefficient measures the speed of the adjustment of the disequilibrium while μ is the white noise.

As long as the co-integrating vector (ECM) ecm_{t-1} is stationary and well defined, (negative), the ECM estimation will then confirm the earlier proposition that the variables are co-integrated. Equations 3, constitutes the maintained hypotheses for the ECM specification search. The insignificant or redundant variables are usually omitted at the parsimonious stage. Finally, diagnostic tests are performed on the results with a view to validating the models.

The Granger causality test is important in determining if it is RGDP or external debt management variables are significant in either enhancing or deteriorating the rate of each other in Nigeria. Although correlation analysis deals with dependence of one variable on the other, it does not imply causation in the real sense. (Zellner, 1979). A statistical relationship in itself cannot logically imply causation. (Kendal and Stuart, 1961). Consequently, the Granger Causality test (Granger (1969) which measures both causation and direction was performed on the variables. The test enables determination of whether lagged information on RGDP (dependent variable) as well as that of the selected external sector indicators, have any statistical significant role in explaining the effect of external debt management variables on Nigeria's real Gross Domestic Product. The test was run with an optimal lag of two.

According to Granger (1969) variable X Granger causes variable Y if the past values of X can be used to predict Y more accurately than simply using the past values of Y. The test involves estimating the pair of regression as expressed below using external debt (independent variable) and Real Gross Domestic Product (dependent variable) as example:

$$RGDP_t = a_0 + \sum_{i=1}^n \alpha_i EXD_{t-i} + \sum_{j=1}^n \beta_j RGDP_{t-j} + \mu_{t1} \dots (4)$$

$$EXD_t = \alpha_0 + \sum_{i=1}^n \alpha_i RGDP_{t-i} + \sum_{j=1}^n \beta_j EXD_{t-j} + \mu_{t1} + \mu_{t2} \dots (5)$$

Equation 4 postulates that current RGDP is related to a number of external debt lags (EXD_{t-i}) or past values of EXD as well as its own past values (RGDP_{t-j}) where α and β are their coefficients, i and j indicate length of time lags while μ_{t1} is the error term and n is the number of lag terms included. RGDP_t is the current value of real GDP. It is assumed that the error terms μ_{t1} and μ_{t2} are uncorrelated. The F-statistic test is used for the joint test of hypothesis.

Bilateral causal relation exists when both null hypotheses are rejected indicating that both coefficients are statistically and significantly different from zero in both regression. This implies a feed-back. Unilateral causal relation exists when one of the null hypotheses is accepted and the other rejected.. Lastly, independent causal relation exist when we both null hypotheses are accepted. (Gujarati, and Porters (2009)

Model Specification

In specifying the effect of external debt on Nigeria’s real economy, it is assumed that increase in the availability of financial resources (debt capital) will lead to higher level of investment and ultimately real economic growth. In addition, government influence comes through two major channels – external debt and Government Capital expenditure (Public infrastructure), which acts as a catalyst to investnt production. The extent external debt has been effectively channeled to provide infrastructure will also influence real growth of the economy.

The specification is therefore based on the Keynesian theory that external debt serves as a catalyst to growth (Jhingan 2004) and also on endogenous growth theory (Romers 1994). Invariably, factors that constrain inflow of resources like exchange rate are also taken into account. The real effects of a policy-induced increase in the short-term interest rate come about when the domestic nominal interest rate rises above its foreign counterparts. Equilibrium in the foreign exchange market requires that the domestic currency gradually depreciates at a rate that, again, serves to equate the risk-adjusted returns on various debts instruments, in this case, making cost of capital (debt charges) higher, Maurice, (2005).

All the variables except exchange rate and external debt interest charges are reduced to logarithm form to make calculation less tedious.

Based on the above theories the functional relationships are specified as stated below:

$$\ln RGDP = f (EXD, EDIC, NFXR) \dots \dots \dots (6)$$

$$\ln RGDP_t = \beta_0 + \beta_1 EXD_t - \beta_2 EDIC_t + \beta_3 NFXR_t + ut \dots \dots \dots (7)$$

Where :

InRGDPt = Real Economic Growth

InEXDt = External Debt

EDICt = External Debt Interest Charges

NFXRt = Nominal Foreign Exchange Rate

ut =Error term or white noise.

Theoretical priori expectation: $\beta_1 > 0$; $\beta_2 < 0$, and $\beta_3 > 0$ or < 0 .

Hence the above estimable long-run linear equation posits that RGDP in Nigeria which is the dependent variable is a function of the above selected explanatory variables – EXD, EDIC and NFXR, ‘t’ indicates time-dependent and μ_t is an unobservable component that is assumed “white noise”.

Data Analysis

The summary of the unit root test results as presented on Table 1 shows that the null hypothesis of non-stationarity is not rejected, implying that the variables are not stationary at level and could only be rejected after the first order differencing / (1) for all the variables at one and 5 per cent levels of significance. This is evidenced by ADF test result at the ordinary level, which shows that the computed negative ADF test statistics for each variable is less than the Mackinnon critical values (Mackinnon, (1991), in absolute in absolute term.

TABLE 1
Summary of Unit Root Test Result Data Presentation

VARIABLE S	AT LEVEL		FIRST ORDER DIFFERENCE		Remarks
	ADF Test Stat	Order of Integration	ADF Test Stat	Order of Integration	
InRGDP	-2.187927	-	-3.226143	/ (1)	**
LnEXD	-1.860782	-	-3.999801	/ (1)	***
NFXR	-2.451152	-	-3.378241	/ (1)	**
EDIC)	-2.254731	-	-4.170888	/ (1)	***
Note:	Critical Value: 1% = -3.6852 5% = -2.9705 10% = -2.6242		Critical Value: 1% = -3.6959 5% = -2.9750 10% = -2.6265		

* = 10% level of Significance
** = 5 % level of

significance

*** = 1 % level of significance

Source: Author’s computation

Table 2

Summary of Johansen Co-integration Test Results Data Presentation

Sample: 1981-2020

Included observations: 40

Test Assumption: linear deterministic Trend in the data

Series: lnRGDP, lnEXD, EDIC, NFXR,

Lags interval: 1 to 1

Eigen- Value	Likelihood Ratio	5% Critical value	1% Critical value	Hypothesized No of CE (s)
0.937152	301.6105	118.22	123.48	None**
0.906051	202.2111	93.05	102.16	At most 1**
0.874464	188.6472	66.42	74.57	At most 2**
0.278103	11.06115	14.21	19.16	At most 5

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 3 co-integrating equation(s) at 5% significance level

Source: Author's computation

The co-integration technique makes it possible to test the existence of long-run equilibrium relationships among non-stationary economic variables used in this research. Engle and Granger (1987) has shown that even if individual variables are non-stationary, there can be linear combinations among them so that they can form a new series, which in the course of time will converge to equilibrium; that is, they will co-integrate. Applying the two maximal likelihood ratio tests (the maximal Eigen-value and the trace statistics), the number of co-integrating vectors were determined.

The summary of the results as presented on tables 2 below shows that there are five (3) co-integration relations at 5 per cent level of significance, with their values, greater than the critical values at 5 per cent significance as indicated in the table. This implies that the test statistics rejected the null hypothesis which states that the variables are not co-integrated and accepted the alternative, implying that there is long-run relationship among the selected variables.

Table 3

Parsimonious Error Correction Model Data Presentation

Series: $\ln\text{RGDP} = f(\ln\text{EXD}, \text{EDIC}, \text{NFXR},)$ Dependent Variable: $\text{DLn}(\text{PINVn})$ (Proxies by GCF)

Method: Least Squares

Sample (adjusted): 1981 2020

Included observation: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.010042	0.299051	-6.721402	0.0001
$\text{DLn}(\text{RGDP}(-1))$	0.404245	0.261621	1.545155	0.1352
$\text{DLn}(\text{RGDP}(-2))$	-0.060011	0.014447	-4.153872	0.0004*
$\text{DLn}(\text{EXD}(-1))$	-0.084869	0.024577	-3.45318.	0.0012*
$\text{DLn}(\text{EDIC}(-2))$	-0.246828	0.091030	-2.711508	0.0081
$\text{D}(\text{NFXR}(-1))$	-0.2203781	0.328661	-0.620036	0.5471
$\text{DIN FXR}(-2))$	0.038430	0.01312	2.929115	0.0068*
$\text{ECM02}(-1)$	-0.133489	0.055848	-2.390219	0.0080*
R-squared	0.802312	mean dependent var	0.04311	
Adjusted R-squared	0.74 5462	S.D dependent var	0.201003	
S.E of regression	0.200222	Akaike info criterion	-2.20222	
Sum squared resid	0.702378	Schwarz criterion	0.11231	
Log likelihood	-14.43534	F-s.tatistic	12.616022	
Durbin-Watson stat	2.31223	Prob(F-statistic)	0.00019	

Source: Author's computation

In the parsimonious Error Correction Model (ECM) result presented in table 3 all the variables are signed as predicted. The F- statistics ratio of 12.61 is significant, indicating that the explanatory variables are collectively important in explaining the variations in RGDP in Nigeria. The Durbin-Watson statistics test ratio of 2.3122 also strongly suggests absence of auto- correlation, implying that the unit root test has been effective in screening the variables to become stationary. The positive and significant relationship of exchange with RGDP indicates high and persistent rate of depreciation. It is an important factor in investment decision as volatility in exchange rate does not encourage long term projects decision. Exchange rate depreciation will increase the cost of interest charges on external debt to Nigeria residents since the currency is denominated in foreign currency of the creditor. Theoretically, an exchange rate overvaluation could hinder the pace of economic growth while an undervaluation is expected to provide an enabling environment for growth, under a regime of low inflation and stable economy; however, for a developing economy like Nigeria, with high inflation tendency, both over valuation and undervaluation are inimical to growth. (Maku, ((2006)

Furthermore, external debt and its interest charges have negative and significant relationship with RGDP and therefore, they are not contributing to the growth of RGDP. This could be attributed to the improper administration of borrowed funds to non productive sector of the economy and high payment of interest charges on debt. Furthermore, keeping other variables constant, one percent increase in nominal FXR induce 3.5% reduction on RGDP on annualized basis while one percent increase in external debt and its interest charges induce 8% and 24% reduction in RGDP. This indicates that interest charges overhang has more devastating impact on the real economy. The lag of the dependent variable (RGDP_{t-2}) was equally significant in explaining the effect of the explanatory variables on RGDP. The impact reflected inter-temporal dependence of RGDP, with the level of RGDP_{1-t} at any one period, determining the level in another. The coefficient of the ECM term (-0.1334) which measures the speed of the adjustment at which equilibrium is restored, is significant and rightly signed (negative) at 5 percent level, and therefore confirms the earlier proposition that the variables are cointegrated. (Gujarati and Porters (2009)

The ECM coefficient also gives the proportion of the short run disequilibrium in the explanatory variables accumulated in the previous period that is corrected in the current period. The speed implies that in the long run, 13 per cent of the short run disequilibrium of RGDP in Nigeria is corrected within a lag during the period under review. (One lag is one year in this study), which suggests that in the long-run, RGDP in Nigeria, adjusts slowly to short run disequilibrium changes in the selected explanatory variables since only 13 per cent of the accumulated disequilibrium in RGDP_t is corrected within a lag. It implies lag effect. (Gujarati and Porters (2009). These findings are in tandem with (Adeyemi (2020), (Ezeanyeji and Okeke (2016), (Udeh, Ugwu and Onwuka (2016), (Ajai and Oke (2012) and Ogege and Epkundu (2010).

Table 4
 Summary of Data Presentation on Pairwise Granger Causality Test
 Sample: 1982 – 2020
 Lags = 2
 Observation = 40 (After Adjusting Endpoints)

NULL HYPOTHESIS	F-STATISTICS	PROBABILIT Y
Ln(RGDP) does not Granger cause Ln(EXD)	0.41861	0.68288
Ln(EXD) does not Granger cause Ln(RGDP)	0.34915	0.70896
Ln(RGDP) does not Granger cause Ln(EIDIC)	3.84841	0.68288
Ln(EXDINT) does not Granger cause Ln(RGDP)	2.28160	0.12476
Ln(RGDP) does not Granger cause Ln(NFXR)	8.05879	0.00223*
Ln(NFXR) does not Granger cause Ln(RGDP)	2.14023	0.14134

At 5 per cent significant level Source: Author’s computation

As presented in table 4 and capitalizing on the F-statistics ratios and the p-values, there exists unilateral causal relationships between (RGDP) and, NFXR, without a feedback. Independent causality runs between the external debt and external debt interest charges and RGDP implying none of the variables determined each other. The general results imply that causal relationships between RGDP and the selected explanatory variables are mixed.

Summary and Conclusion

This study examined effect of external debt management on the real economic growth of Nigeria, spanning from the 1981 to 2020, using external debt, external debt interest charges and nominal foreign exchange rate as explanatory variables. The overall import of the findings and analysis imply that the selected explanatory variables have adverse effect on RGDP as indicated by significant inverse relationship of external debt and external debt interest charges with RGDP and significant positive relationship of nominal FXR with RGDP which implies high rate of depreciation. This suggest that they are not contributing to the growth of the real economy

The study therefore recommends as follows:

- i. that government should strive to achieve: sustainable price stability through effective management of exchange rate in order to minimize depreciation of Naira. Exchange rate depreciation will increase the cost of interest charges on external debt to Nigeria residents since the currency is denominated in foreign currency of the creditor. Depreciation of Naira would have encouraged exportation but Nigerian government has neglected the non-oil real sector and concentrates on crude oil exportation.
- ii. Managerial debt efficiency (in addition to adequate monitoring) that would channel external borrowed funds to their specific tied projects should be highly emphasized to minimize external debt interest charges payment overhang. If borrowed funds are efficiently utilized on productive projects, employment will improve and the citizenry welfare will be enhanced.
- iii. The policy makers should take cognizance of the lag effect and design policies in line with the expected magnitude of the expected changes

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