



Analysis of External Debt and Real Economic Growth of Developing Economies: Nigeria's Experience

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Increase in external debt burden, together with its attendant risk, have become a global phenomenon, ravaging many developing economies, Nigeria inclusive. Global attempts by some economic scholars to validate the relationship between external debt and economic growth have also generated mixed results. Recently, there is an implicit belief by Nigerian public/stakeholders that her increasing level of external debt is adversely affecting her real economic growth (RGDP). This study therefore, empirically investigated the relationship between Nigeria's RGDP and her external debt (EXD), adding external debt interest charges (EDIC) and nominal foreign exchange rate (NFXR) as control variables. The source of the study data is CBN and it spans for a period of 1980 to 2022. The study applied Co-integration technique, Error Correction Model (ECM) and Granger Causality tests for the econometric analysis. The empirical investigations confirmed that, in the longrun, the selected explanatory variables had significant adverse effect on Nigeria's RGDP. The Granger Causality test showed that NFXR had unilateral relationship with RGDP, which implies that NFXR determines RGDP without a feedback, while EXD and EDIC established independent relationships with RGDP. The ECM coefficient (-0.154347) is significant and negatively signed. It

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measures the speed of the adjustment at which equilibrium is restored to RGDP, after the short-run disequilibrium in the selected explanatory variables. This implies that, in the longrun, Nigeria's RGDP growth process, adjusts slowly to the variations in the selected time series, which indicates a Policy lag effect. The study, therefore, recommends effective and sustainable debt management and monitoring to ensure that borrowed funds are spent on productive projects. Government should seriously pursue effective Exchange Rate management. Finally, the Policy makers should design policies that would match the magnitude of the expected changes in order to counter the lag effect.

Keywords: External debt; real economic growth; co-integration; error correction model and granger causality test.

1. INTRODUCTION

In recent times, escalating external debt challenges have become a global phenomenon within many developing countries, Nigeria inclusive. The accumulations of debt stocks of most developing economies have really shown signs of future debt unsustainability. This problem is implicitly believed to be inhibiting their economic growth and development. An optimal utilization of external debt enhances economic growth but when improperly managed, causes stagnant growth of any economy [1].

The percentage of external debt to GDP is the ratio between a country's nominal GDP and the debt, which that country owes to non-resident creditors. According to World Bank [2], this ratio has been on increase for most developing economies. The evidence could be seen when it is compared with its level during the global economic crises of 2007/2008 and its level in pre-pandemic of 2019. For instance, it was 23.3% in 2011 and 29.1% in 2018 and in 2022; it rose to 44.1% (US\$11.4 trillion). World Bank [2] and UNCTAD [3].

"Economic growth could be referred to as a sustained and positive boost in the level of total goods and services produced by a country within a given period. Gross Domestic Product (GDP) commonly represents this. Its benefits include raising the general standard of living of the citizenry, as measured by per capita income; enhancing the basic needs of man to a substantial and sustainable extent; and making income distribution easier to achieve. Conversely, economic stagnation can result to destabilization and suffering upon the citizenry" [4], WorldBank. [5]

The difference in growth rates between developed and developing economies is partly due to differences in the management quality of their public debts. (Joshua et al (2022). {1}, as

well as Adewale and Meyer [6]. Many economies of developing countries tend to restrict the growth of their economies through corrupt management. In most cases, they do not invest the external debt on profitable projects based on their initial purposes but on projects that would be more conducive for misappropriation [7]. Financial and economic stability is paramount for the growth of any economy but instability can disrupt the growth of any economy.

"In Nigeria, there are many staggering structural imbalances. The present and most undesirable, is the challenge posed by external debt .and how economic planners can enhance her RGDP". Ogbonna and Okosu [8]. "Recently, the persistent increase of Nigeria's external debt, as a developing economy, and the volatile and suboptimal performance of her real economy, has generated many agitations among the stakeholders and the public in general. The country's outstanding external debt increased from \$3,545 billion in 2006 to \$3,654 billion in 2007. It rose further to \$3,720 billion, \$3,947 billion, \$4.6 billion, \$5.67 billion, \$6.53 billion and \$8.82 billion in 2008, 2009, 2010, 2011, 2012 and 2013 respectively" [9] and DMO [10]. As at 31st December, 2022, Nigeria's total Public debt stock stood at US \$ 103.11(N44.06 trillion), comprising her external debt which was US\$41.69 billion (N18.70 trillion) and domestic debt of N27.55 trillion (US\$61.41 billion) [11].

At the same period, her external debt service charges stood at US\$0.31 billion (N5.6 trillion), [11]. The huge level of external debt and its interest charges have already become a challenge to the economic planners as the government obligations to the citizenry are yet to be met. [12] and [13]. The share of her external debt to total public debt was 40.44% while domestic debt was recorded as 59.56 %, [11]. The National Bureau of Statistics (NBS), [14] recorded that as at second quarter of 2023, Nigeria's total external debt increased to

US\$43.16 billion (N33.25 trillion) while her total domestic debt stood at N54.13 trillion (US\$70.26 billion).

Likewise, the growth rate of her real economy has been dwindling and very volatile. The growth rate of Nigeria's RGDP, which was 3.40% in 2021 ending, went down to 3.10% as at December 2022 [11]. Perhaps, the situation could have been worse if there was no cancellation of the Paris Club debt in 2005.

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 while the sum of \$4.9 billion was paid on debt servicing before the debt cancellation deal [15] and [16]. Unfortunately, such indebtedness is at the detriment of the local currency in the long run. This is because both the debt and its interest charges must be repaid in that foreign currency. Definitely, this is expected to give rise to exchange rate instability, thereby resulting to suboptimal growth of the economy.

Furthermore, the Nigerian exchange rate as at 2022 ending worsened as it depreciated to N448 per US dollar [11]. According to Imimole, et al. [17] and Darma [18], as at the ending of 1980, when Nigeria was exporting both oil and non-oil products, the official average exchange rate was N0.530 to US dollar [14].

The analysis of Nigeria's increasing debt and service charge cannot be detached from decades of insecurity; her leaders' poor administration and corruption, typified by her existing substantial deficit financing budget which could not show any infrastructural improvement; and improper allocation of the external debt to non-productive sector. Consequently, the investors (both foreign and domestic) are scared to invest. Sandow, et al (2022). The public assumption is that these challenges have cumulatively and adversely affected Nigeria's RGDP; hence the agitation. There is therefore need for empirical investigation to establish the real position.

Furthermore, in measuring the financial leverage of any economy, the percentage of debt to GDP should not exceed 60% while the maximum ratio of service charge to revenue should be between 20 to 22.5 per cent [19]. Unfortunately, Nigeria's Debt to GDP ratio recorded 107.06%; 108.46%; 113.9%; 136.51%; and 139.65% in 2018; 2019; 2020; 2021 and 2022 respectively. Her ratio of

debt service to revenue stood at 27.69%; 29.17%; 35%; 83.2% and 96.3% in 2018; 2019; 2020; 2021 and 2022 respectively [11] as well as [2]. All these figures were above the globally accepted records. The implication is that the country's risk of default and future debt unsustainability can cause a financial panic in the domestic and international market. There is therefore need for empirical investigation to see if these problems, could be averted.

Finally, there is a controversy among some economic scholars on the relationship between external debt and economic growth in some developing economies. Some scholars like Mumba and Li [20], Kasidi and Said [21], Finckle and Greiner [22], Frimpong and Oteng-Abayie [23] as well as Hameed, Ashraf and Chandhary [24], concluded that external debt can accelerate economic growth. This conclusion is in tandem with the Keynesian theory of capital accumulation and endogenous economic growth theory.

Conversely, other economic scholars concluded that external debt had adverse effect on economic growth. They believe that at a certain level, debt accumulation becomes a burden and will no longer stimulate growth: These include: Adewale and Meyer [6], Makun [25], Akinlo [26], as well as Atique and Malik [27]. This controversy also calls for further empirical investigation.

The main objective of this study is therefore, to investigate empirically the relationship between Nigeria's real economic growth and her external debt (EXD) while the specific objectives are to investigate the effect of EXD, external debt interest charges (EDIC) and nominal foreign exchange rate (NFXR) on Nigeria's RGDP.

To achieve these objectives, the hypotheses below were formulated to aid the analysis:

- i. There is no significant long run relationship between the growth of Nigeria's real economy, proxies by Real Gross Domestic Product (RGDP) and external debt, external debt interest charges; and nominal foreign exchange rate.
- ii. There is no direction of causal relationship between RGDP and external debt, external debt interest charges and nominal foreign exchange rate.

2. REVIEW OF RELATED LITERATURE

Section 2 reviews the conceptual, theoretical and empirical studies that are related to external debt and real economic growth.

2.1 Conceptual Review

2.1.1 External debt

External debt refers to that portion of a country's debt or loan that is borrowed from foreign lenders, including commercial banks, governments or international financial institutions for the purpose of financing productive activities and developments associated with the welfare of citizenry. (Oyejide, Soyede and Kayode [28]. External debt is further defined by the World Bank [29] as debt owed to non-residents of an economy, repayable in terms of foreign currency, food or services. This is because the borrowing country cannot print the foreign lender's currency [30].

Additionally, Gross external debt, at any given point in time, is the outstanding amount of the actual current and not contingent liabilities that require payments of interest and / or principal by the debtor at some point in future. Gross external debts are owed to non-residents by residents of an economy [31] as well as Adeyemi [32].

According to Arnone, Bandiera and Presbitero [33], external debt is that portion of a country's debt that is borrowed from foreign lenders, including commercial banks, international financial institution and governments. Some countries demand for external debt when their domestic financial resources are inadequate to finance public infrastructure for the growth of the economy and welfare of the citizenry [34].

Furthermore, Public debt is the aggregate of all claims against a government, held by private sectors of the economy or foreigners, whether bearing or not, less any claim held by the government against private sectors or foreigners. Public debt could be external or internal. Internal debt refers to debt borrowed within the borders of that economy while external debt, as described above, is from foreigners. World Bank [29].

Conversely, debt interest charge, as a ratio of GDP, is an important indicator of debt sustainability. It measures the ability of government to meet external creditors' claims on the public external debt through export revenues. A persistent deterioration of this ratio signals an inability of the government to generate enough foreign exchange income to meet external creditor obligations on country's external debt. The resultant effect is potential debt distress

without multilateral support or effective sovereign debt restructuring [35].

According to [36], external debt management refers to the establishment of the condition of issue and redemption of foreign loans. It involves the process of administering the external public debt by providing for the payment of interest and arranging the refinancing at the maturity of bonds/debt. External debt management is therefore, a conscious and carefully planned schedule of the acquisition and retirement of loans contracted either for development purposes or to support the Balance of Payments. It makes use of estimates of foreign earnings, sources of exchange finance; the project returns from the investment; and the repayment schedule. External debt management also includes an assessment of the country's capacity to service existing debts and a judgment on the desirability of contracting loans. Joshua et al. [1] views effective and adequate management of debt as an optimal utilization of external debt to enhance economic growth. However, it causes stagnant growth of the economy when it is improperly managed.

2.1.2 Economic growth

Economic growth could be referred to as a sustained and positive change in the level of aggregate goods and services produced by a country over certain and given period of time. It can be stated in terms of per capita income when it is divided by the population of a given country. It can be stated in nominal or in real terms also. Real economic growth (RGDP) is achieved when the increase in aggregate level of goods and services is deflated by rate of inflation. Conversely, it is referred to as nominal economic growth (GDP) when it is not deflated by inflation rate [4]. Economic growth is a key policy objective of any government and monetary policy is a major instrument for attainment of such objective [31].

However, the concept of economic growth and its measurements have not been quite easy to comprehend in real terms. This is because some economics authors have differentiated economic growth from the term "economic development" in different ways [37].

Authors like Todaro [38] and Baran [39] argue that the mere increase in the aggregate level of goods and services produced in a country, do not explain the quality of life of a citizenry, given the

threats of global pollution, lop-sided distribution of aggregate income, environmental degradation, chronic and deadly diseases and absence of freedom and justice, etc. These authors believe that much emphasis should not be laid on mere increase in aggregate output and income but also on the total quality and standard of living of the citizenry.

On the other hand, it is evident that there is no satisfactory measure of "quality of life" that can be practically applied to quantitative measure of aggregate output and income that would be sustainable and acceptable to every individual. The apparent consensus is that economic growth refers to an increase in the aggregate level of output within a given time period in a country. Economic development refers to an increase in the aggregate level of output and income with due consideration given to the quality of life that hopefully takes into consideration the distribution of income; healthcare; environmental degradation; global pollution; freedom and justice, etc. [39].

Generally, economic development is a process by which an economy experiences three main phenomena namely: growth in output, structural changes and institutional changes. If the three phenomena take place, it will lead to a rise in standard of living of the populace. That is why growth can be enjoyed by many economies but not all experience development [4]. Effective economic growth ought to be practically experienced, when it goes with development.

2.1.3 Review of Nigeria's external debt stock

Nigeria's external debt are basically sourced from multilateral agencies like Paris Club of Creditors, London Club of Creditors; IMF; African Development bank; World bank; Promissory Note Holders; Bilateral and Private Sector Creditors and other sources [40]. According to CBN [41] following a recession in 1977/78, Nigeria raised the first one billion loan US Dollar (US\$1b) known as Jombo loan from International Capital market to finance her infrastructural projects.

Prior to the establishment of Debt Management Office (DMO) on 4 October 2000, Nigeria's debt management was weak as it was managed by a myriad of establishments in an uncoordinated manner. There was persistent increase in Nigeria's debt stock. Consequently, DMO was established to enhance effective central

coordination of Nigeria's debt in order to improve the growth of her economy. Despite the DMO's activities, Nigeria's real economic growth has remained sluggish and suboptimal without showing much progressive effect of DMO [42].

As at December 31 2004, Nigeria's external debt stood at US\$35.994 billion (N44.82 trillion) at the official exchange rate of N134 to US\$1.00. [43]. In 2005, the country started experiencing considerable difficulties in meeting her scheduled external debt service obligations as her total revenue was about \$9 billion in 2005 ending [44].

On April 21, 2006, the Paris Club of Creditors granted Nigeria "Debt Relief Deal". This led to the decline of her external debt from US\$35.994 billion in 2004 to a tune of US\$3.5 billion in 2006 ending [45]. The positive result was attributed to the significant Paris Club debt and repayments cancellation.

Unfortunately, after 2007, Nigeria's external debt started increasing again from US\$3.9 billion in 2009 to US\$4.6 billion and US\$5.7 billion in 2010 and 2011, respectively. This was as result of Federal Government drawdown on multilateral loans. [46] It grew further to US\$10.72 billion in 2015. [47]. As at December, 31st 2022, Nigeria's external debt stock was US\$41.69 billion (N18.70 trillion) and as at 2nd Quarter of 2023, it stood at US\$43.16 billion (N33.25 trillion) The share of external debt (in Naira value) to total Public debt was 38.05% , while the share of domestic debt (in Naira value) to total Public debt was 61.95% [14].

Furthermore, her ratio of debt service to revenue stood at 27.69%, 29.17%, 35%, 83.2% and 96.3% in 2018, 2019, 2020, 2021 and 2022 respectively. [11] as well as [2]. The above ratios were globally unacceptable and therefore raised an impression that the country is at risk of default and future debt unsustainability, hence the public agitation.

According to Ogbonna and Okosu [8] the above challenges are expected to have a cumulative adverse effect on her RGDP as a result of the increasing external debt service burden and improper direction of the external loans to non-productive sector by her political leaders

2.2 Theoretical Review

2.2.1 External debt

There are many theories that link economic growth and external debt but attention is given only to those ones that are relevant to this work.

The first is Keynesian theory of capital accumulation, which suggests that increasing capital accumulation through government external debt accelerates growth. The theory argues that using external debt as a source of capital can act as a catalyst to economic growth. This can increase production capacity of an economy, especially developing economies [30,48].

The second is Debt over-hang theory, which was propounded by Howard in 1972. Debt over-hang refers to a debt burden that is so large that a borrowing country cannot take on additional debt to finance her future projects. This theory stresses that such burden dissuades current investment and ultimately, economic growth. Debt over-hang identifies investment as a primary channel through which debt can have impact on economic growth. The theory argues that if future debt stock is larger than a country's repayment ability, then the expected increasing debt service obligations will likely affect the country's GDP adversely [49]. This implies that large accumulation of debt stock and increasing external creditors' imposition of high marginal debt service charges, can discourage private investment. This is because private investors would expect heavy taxation by the government to pay off the increasing debt interest charges. Ultimately, economic growth will be adversely affected [50].

Another implication is that both the external debt stock and the interest element, can only be repaid in foreign currency and the borrowing country cannot print the lender's currency. Therefore, the persistent increase in demand for foreign currency to repay both the debt and debt interest charges, tend to affect the exchange rate of the borrowing country negatively. Jhingan [30]. The theory has been extensively explored by Turan and Yanikkaya [51] as well as Saheed and Sani [52].

The third is Ricardo's Equivalence economic theory on public debt. This theory suggests that when a government tries to stimulate an economy through increasing debt-financed spending, demands remains unchanged. This is because the public would increase their savings instead of demand, in order to pay for expected future tax increases by the government. They assume that whatever savings gained now will be used to pay for future higher taxes that would be levied by government to offset the debt. Robert Barro who stipulated that people's

consumption be determined by their lifetime present value after-tax income, (their inter-temporal budget constraint), elaborated this theory. Ricardo, David [53]. The implication of the theory is that no matter how the government decides to increase spending by borrowing, government cannot stimulate the economy.

Ricardo, David's Classical theory of public debt also opposes public borrowing. In his view, borrowed fund is invariably wasteful, can be misappropriated and irresponsibly spent by corrupt administration because it is an easy income [54]. The requisite funds needed to sustain an economy should be an export income from diversified natural resources of the economy.

Another old threshold school of thought, led by Calvo, 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 a lower rate of return on capital; lower investment and ultimately, lower growth. The theory maintains that low debt and efficient management of debt leads to higher growth rate. Jhingan [30,34].

2.2.2 Economic growth

There are three waves of interest that could be incorporated in studying growth. The first wave is the work of Sir F. Harrods (1900-1978) and E. Domar (1914-1997), commonly referred to as "Harrods – Domar Model". The theory presumes that growth depends on a country's savings rate, capital/output ratio, and capital depreciation. The theory is criticized for three reasons. Firstly, it centers on the assumption of ergogeneity for all key factors. Secondly, it disregards technical change, and lastly, it does not give room for diminishing returns when one factor expands relative to another [55].

The second is the neoclassical (Solow) model, which argues that growth reflects technical progress and key inputs of production, (labour and capital). The theory allows diminishing returns, perfect competition but not external factors. The model stresses that capital stock needs savings to increase. It also presumes that capital accumulation, which ensures diminishing marginal returns and capital per unit of labour,

has some limitations. However, it hardly explains the sources of technical change, regardless of these modifications. Romer [56].

The third is the endogenous growth model that emerged in the 1980s. The theory emphasizes that economic growth is an outcome of an economic system and not the outcome of external forces. The fundamental idea is that economic growth results from the effort to economize, the accumulation of knowledge, and the accumulation of capital. The theory stresses that anything that enhances economic efficiency is good for growth and encourages innovations. Thus, the theoretical framework indigenizes technological process through "innovation processes". It also introduces human capital, governance and institutions in the overall growth objectives [56,55].

The emphasis on knowledge and technology in the Schumpeterian model raises question about the role of government in promoting growth. Government should act as a critical agent that provides key intermediate inputs, establishes rules, and reduces uncertainty, by creating the right macroeconomic environment for growth [57].

The endogenous theory fits the real world perfectly well because it traces growth of output per capita to two main sources: savings capital and efficiency. This implies that it is not only factor accumulation that drives growth but also efficiency in utilizing them. The economic policy implication of this theory is that of achieving sustainable economic growth and stability through efficient management of debt (capital) and savings. Patillo et al. [58,59].

2.3 Empirical Review

External debt whether in developed or developing economies, primarily aims at providing additional funding to meet up deficit budget for infrastructural development and general growth of an economy. However, there are some divergent findings from empirical studies reviewed as shown below. The outcome of each study depends on the economic structures of the economy studied and the method of analysis applied by researchers.

Mumba and Li [20] investigated the relationship between external debt and economic growth using a panel data for 28 developing economies in Asia between 1995 and 2019. They concluded

that external debt has positive relationship with economic growth.

Finckle and Greiner [22] investigated the relationship between public debt and economic growth for eight emerging market economies (Brazil, India, Indonesia, Malaysia, Mexico, South Africa, Turkey and Thailand) between 1980 to 2011. They employed fixed effect and random effect estimators and found that external debt has positive effect on growth.

Frimpong and Oteng-Abayie [23] investigated the impact of external debt to economic growth in Ghana between 1970 – 1999, using Johansen-Juselius multivariate co-integration and error correction model. They found that GDP is positively related to external debt.

Kasidi and Said [21] in their study on the impact of external debt on economic growth in Tanzania covering a period 1990 to 2010, applying OLS. They established that external debt had a significant positive effect on Tanzania's economic growth while debt servicing charges had a significant negative effect.

Adewale and Meyer [6] in their study investigated the channels through which external debt transmit its impact on growth in 30 sub-Saharan African countries using generalized method of moments technique, applying panel data. The debt service charges, fixed capital formation and external debt were identified to have negative relationship with GDP of the countries involved.

Lau, Moll de Alba, and Liew [60] in their recent study investigated the effect of external debt on economic growth of 16 selected developing economies in Asia, applying Panel data. The period of the study was 1980 to 2016. They concluded that external debt has adverse effect on economic growth. They recommended that fiscal discipline that targets appropriate debt to GDP ratio in developing countries of Asia is very important for sustainable economic development of these economies

Adeyemi [32] in his study titled: External Debt and Economic growth in Ngeria: An Implication for Debt Overhang Theory; established that external debt, exchange rate and debt interest charges contributed significantly to the suboptimal and sluggish growth of the economy.

Makun [25] in his study applied a panel data using ARDL, between 1980 to 2018, in the

context of neoclassical growth theory for Pacific Island countries. He concluded that external debt has a negative effect on economic growth. He recommended better fiscal management and minimization of unproductive expenditure.

Akinlo [26] studied the relationship between external debt and economic growth in Nigeria using her time series between 1970 and 2016, applying Markov switching approach. He concluded that the effect of external debt on economic debt was significantly negative.

Patillo, Helen and Luca [58] 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. The study established that external debt had significant and negative impact on physical capital formation of the economies studied which ultimately affects growth.

Atique and Malik [27] 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.

Ogege and Ekpudu [61] tested the relationship between debt burden and the growth of the Nigerian economy using OLS method of regression. 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 [62] investigated the impact of external debt stock, external debt service charges and exchange rate on economic growth in Nigeria, using OLS method. The result showed that exchange rate external debt shock, external debt service charges adversely affected and the nation's economic growth.

Sulaiman and Azeez [63] 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 level of depreciation of Naira.

Udeh, Ugwu and Onwuka [64] 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, co-integration, and error correction model. The study established that in the short-run, external debt has positive relationship with GDP while in the long run, external debt interest charges and exchange rate have adverse effect on GDP.

Senadza et al. [65] investigated the effect of external debt on economic growth on 39 Sub Sahara African countries from 1990 to 2013 using Generalized Method of Moments (GMM) technique. The findings revealed adverse effect of external debt on economic growth of the SSA countries and there was linear relationship between the two variables.

Amooteng and Amaoko [66] 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.

Ajayi and Oke [12] 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.

Joshua et al. [1] in their study on the effect of external debt on Economic growth of 31 selected Sub-Saharan countries, taking into account whether heterogeneity makes a difference in public sector management, applied System Generalized Method of Moment spanning 2005 to 2017. The study revealed that external debt, without difference in heterogeneity has a significant negative effect on growth. They also found that external debt significantly complements public sector management to boost growth for economies with strong quality public sector management.

Yolcu Karadam [67] conducted a cross-country study to examine the non-linear relationship between external debt and economic growth unbalanced panel of 24 developed and 111 developing countries, using Panel Smooth Transition Regression (PSTR) technique. The

findings established that the effect of external debt on economic growth changes from positive to negative as the debt stock increases.

2.4 Reviewed Literature Gap

Some past analysis of reviewed literature on external debt and economic growth of some developing economies had been largely devoid of in-depth empirical analysis [68].

For instance, most of the previous studies reviewed have some methodological and conceptual problems that undermine their accuracy and thus their efficacy for effective policy implementations. Nearly, almost no reviewed studies applied unit root test, which tend to reduce spurious results. For a example, Ijeoma [62], Ogege and Ekpudu [61] and Ajayi and Oke [12] did not apply unit root test. Estimation of non-stationary time series on another could lead to accidental or induced auto-serial correlation. This can give rise to spurious regression. Unit root test is a strategy for reducing the risk of spurious regression [69,70]. Furthermore, Senadza et al. [65]. and Amooteng and Amaoko [66] applied cross country analysis. The use of cross-country analysis precludes country specifics. There are at least two important caveats that might affect such results. The first is that such cross-country analysis is affected by multiplicity of issues of parameter heterogeneity, omitted variables, model uncertainty and measurement error [71]. Any conclusion based on such results, leads to potential biases. Blonigen and Wang [72] also argue that pooling rich and poor countries together without distinguishing between their level of development leads to wrong conclusions.

Furthermore, Udeh, Ugwu and Onwuka [64] and Sulaiman et al. [63] in their studies applied econometric analysis but their observations were limited to 2013 and 2010 respectively. However, dependable qualitative facts and appropriate policy would address limitations facing external debt problem in developing economies but well-articulated econometric analysis of the nature of this study, would provide a stronger basis to analyze the problem.

There is therefore need to reexamine these challenges holistically, having recognized the gaps, by updating the number of observations of the study to 2022, using Nigerian time series and applying realistic econometric analysis to see if a more reliable result could be achieved. The

outcome is expected to enhance effective policy planning and implementations.

3. METHODOLOGY

3.1 Estimation Technique and Procedure

The study applied econometric analysis based on co-integration, unit root test, Error correction mechanism(ECM)and Granger causality test for the data analysis. Secondary data time series used for the study were sourced from CBN Statistical Bulletin, Debt Management Office, and CBN Annual Reports and Statement of Accounts(various issues). The study covered a peroid of 1981 to 2022 to arrive at a dependable and unbiased analysis. The study applied ex-post facto research design in order to determine the cause-and-effect relationship between the dependent and explanatory variables used for the study.

The OLS level series regression was applied at first stage to test for long run relationship between RGDP (dependent variable) and external debt, external debt interest charges and nominal foreign exchange rate (explanatory variables). However, based on the characteristics of the time series used, the author carefully noted the probability of stochastic error terms that might have entered the model, which could give rise to spurious regression. Consequently, a further rigorous investigation was made using Augmented Dickey Fuller (ADF) [73] unit root test to check if the selected variables used for the study are stationary or not.

3.1.1 Unt root test

A time series is stationary if its means, variance and auto-variance are not time- dependent. Gujarati and Porters [69] The purpose of Unit root test is to confirm if the time series used for the study have a stationary trend, and, if non-stationary, to show the order of integration through 'differencing'. The assumption is that the variables used for this study have unit root stochastic process that could be represented as follows:

$$\Delta Y_t = \beta_0 + \beta_1 t + \alpha Y_{t-1} + \sum_{i=1}^m \alpha_i \Delta Y_{t-i} + \epsilon_t \dots (3.1)$$

where: Y represents the single variable for (External debt, external debt interest charge and nominal foreign exchange rate) under

investigation; β , is the parameter coefficient, ϵ_t is a pure white noise error term; α 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 variable is stationary is accepted.

3.1.2 Cointegration test

The objective of this test is to determine if there is existence of long-run equilibrium relationships among variables used in this research.

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.

The author applied Johansen [74] co-integration test based on the likelihood of their behavioral co-movement, which implies possibility that the selected variables trend together towards stable long run equilibrium. A full information maximum likelihood was specified using Vector Autoregressive (VAR) equation, as mathematically stated below:

$$y_t = a_1 y_{t-1} + \dots + a_k y_{t-k} + \phi x_t + \mu_t \quad (3.2)$$

where: y_t is a k -vector of 'differenced' stationary time series, ' k ' is 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 coefficients of the deterministic variables, μ_t is a vector of innovations or error term, which is known as the adjustment parameter in the vector error correction model, while " t " indicates time dependent.

Using this method, the equation was estimated in an unrestricted form and then tested whether the restriction implied by the residual rank of the co-integration, could be rejected.

The numbers of Co-integration relations were determined by applying the maximal non-zero eigen-values and the trace test of the maximum likelihood ratio; with reference to the level of significance. This result indicates the existence of long run relationship among the selected variables used for the study [74].

3.1.3 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. The objective of this test is to capture the time series properties of the variables used, through the complex lag-structures allowed, while at the same time incorporating an economic theory of equilibrium. It thus preserves the long run relationship while specifying the system in a short run dynamic way. Granger and Newbold [75] and Engel and Granger [70] 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 (VECM) is a restricted VAR that has co-integration restriction built into the specification. VECM analyzes cointegrated variables in relation to non-stationary error correction term. The deviation from the long equilibrium is corrected gradually through series of partial short-adjustment [69].

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 ECM. A search for parsimony in this dynamic model typically follows the general-to-specific modeling (using various information criteria (Akaike, Schwarz, log likelihood, etc)).

Furthermore, search for parsimony in this dynamic model typically follows the general-to-specific modeling (using various information criteria (Akaike, Schwarz, log likelihood, etc)). This helps to minimize the possibility of estimating relationship while retaining long-run information, if the time series used have different order of integration [70]. The functional form of the model that was initially presented in a general form, which incorporated many lag terms, was then reduced to a specific or parsimonious structure by empirical testing and elimination. The specification as shown below is therefore re-parameterized in a dynamic process and OLS regression applied.

$$RGDP_t = a_0 + \sum_{i=1}^m a_i RGDP_{t-i} + \sum_{i=0}^m a_i Z_{t-i} + \mu_t \quad (3.3)$$

Where:

$RGDP_t$ is a vector of endogenous variable and dependent variable, a_0 is a constant, $RGDP_{t-1}$ is

its lag term, Z_{t-1} is lag term of a vector of the selected explanatory variables, a_i is the parameter coefficients, ecm_{t-1} is error correction term, which is the residual from the long-run co-integration process. Its coefficient measures the speed of the adjustment of the disequilibrium and μ_1 , the white noise. The insignificant variables are usually omitted at the parsimonious stage. Finally, diagnostic tests are performed on the results with a view to validating the models.

As long as the 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 3.3, constitutes the maintained hypotheses for the ECM specification search.

3.1.4 Granger causality test

The objective of Granger Causality test [76] is to determine both causation and direction of the variables used for the study. The test enables determination of whether lagged information on RGDP (dependent variable) as well as that of the selected explanatory variables, have any statistical significant role in explaining the effect of the selected explanatory variables on the RGDP.

The Granger causality test is important in determining if it is RGDP or the selected variables are significant in either enhancing or deteriorating the rate of each other. Although correlation analysis deals with dependence of one variable on the other, it does not imply causation in the real sense. [77]. A statistical relationship in itself cannot logically imply causation [78]. According to Granger [78] variable X Granger causes variable Y if the past values of X could be used to predict Y more accurately than simply using the past values of Y. The test applied an optimal lag of two.

An example, using an estimation of a pair of regression of RGDP (dependent variable) and external debt (independent variable), is shown below:

$$RGDP_t = a_0 + \sum_{i=1}^n \alpha_i EXD_{t-i} + \sum_{j=1}^n \beta_j \ln RGDP_{t-j} + \mu_1 \quad (3.4)$$

$$FXR_t = b_0 + \sum_{i=1}^n \phi_i RGDP_{t-i} - \sum_{j=1}^n \varphi_j EXD_{t-j} + \mu_2 \quad (3.5)$$

Equation 3.4 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, μ_1 is the error term, n is the number of lag terms included, and $RGDP_t$ is the current value of RGDP. It is assumed that the error terms μ_1 and μ_2 are uncorrelated. The F-statistic test is applied for the joint test of the hypothesis.

In like manner, equation (3.5) postulates that current external debt (EXD_t) is related to a number of RGDP lags ($RGDP_{t-i}$) or past values of RGDP as well as its own past values EXD_{t-j} . This process applies to each parameter used in the study.

Bilateral, unilateral and dependent causal relationships can be established. Bilateral causal relation exists when both hypotheses are accepted 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 both hypotheses are rejected [69].

3.2 Model Specification

The specification is based on the theory of Keynesian capital accumulation and endogenous growth theory. The theories assume that external debt as a catalyst to growth, will lead to higher level of investment and ultimately, to increased RGDP [30,56].

Additionally, other factors that constrain inflow of resource capital, if mismanaged, are also taken into consideration. These are exchange rate and external debt interest charges. In relation to Nigerian experience, when a policy-induced short-term interest rate or domestic nominal interest rate rises above its foreign counterparts, it affects RGDP negatively [32].

Furthermore, equilibrium in the foreign exchange market requires that the domestic currency gradually depreciate at a rate that serves to equate the risk-adjusted returns on various debts instruments. This makes the cost of capital (debt charges) higher. Maurice [79]. Therefore, excessive exchange rate depreciation is expected to affect RGDP adversely.

Consequently, debt service charge and foreign exchange rate are included as control variables since both the capital and interest charges are paid back in the foreign currency.

The model variables are reduced to logarithm form to make calculation less tedious with exception of exchange rate and external debt interest charges.

The functional and linear mathematical relationships are specified as stated below based on the above theories.

$$\ln \text{RGDP} = f(\text{EXD}, \text{EDIC}, \text{NFXR}).$$

$$\ln \text{RGDP}_t = \beta_0 + \beta_1 \text{EXD}_t - \beta_2 \text{EDIC}_t + \beta_3 \text{NFXR}_t + u_t$$

Where:

$\ln \text{RGDP}_t$ = Real Economic Growth

$\ln \text{EXD}_t$ = External Debt

EDIC_t = External Debt Interest Charges

NFXR_t = Nominal Foreign Exchange Rate

u_t = Error term or white noise.

Theoretical priori expectation = $\beta_1 > 1$, $\beta_2 < 1$ and $\beta_3 > 1$.

The above estimable long-run linear equation hypothesizes that RGDP in Nigeria (dependent variable) is a function of the selected explanatory variables – EXD, EDIC and NFXR, ‘t’ indicates time-dependent and ‘ μ ’ is an unobservable element that is assumed “white noise”.

4. DATA PRESENTATION AND ANALYSIS

Section four presents the data, the empirical findings and discussions on the relevant results from the model specifications tested in this study. Table 1, summarizes the empirical result of the OLS multiple regression, (level series).

4.1 Analysis of the Ordinary Least Square (OLS) Series Result

The OLS level series result is presented on Table 1. It shows that the coefficient of determination (R-square) is ‘a good fit’, indicating that 84 per cent of the variations in RGDP are determined by the combined effect of changes in the selected explanatory variables used for the study. The F-statistics (101.07) confirms further that these explanatory variables are jointly and statistically important in explaining the variations in the growth process. The explanatory variable, NFXR, is rightly and positively signed in accordance with the theoretical priori expectations (but not significant) while EXD and EDIC are not,

as they are negatively and positively signed, respectively with RGDP.

However, a critical look at these diagnostics tests suggests possible biased result in relation to low Durbin Watson (DW) statistics ratio (1.06), coupled with very high R-squared (0.84), which imply time-dependency of these selected variables at this level. Consequently, a more rigorous test of looking at the inherent properties of these time series by testing for stationarity or otherwise, is required. The variables were therefore subjected to Augmented Dickey Fuller (ADF) [73] unit root test.

4.2 Analysis of Unit Root Test

The main objective of this test is to confirm whether the selected time series used for the study have a stationary trend, and if non-stationary, the number of times the variables have to be differenced to get to a stationary trend. The selected variables were subjected to the ADF unit root test separately, at ordinary and first order levels of differencing, based on the suspicion that they are time-dependent in the OLS regression model.

The summary of the unit root test results as presented on Table 2, shows that the null hypothesis of non-stationarity is accepted because the variables are not stationary at level. They could only be rejected after the first order “differencing” (1) for all the variables, at one and 5 per cent levels of significance. This result is confirmed by the 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 [80].

Johansen co-integration test was applied to test the long run relationships of these variables used for the study, based on this outcome,

4.3 Analysis of Co-integration Tests Results

The objective of this test is to investigate if there are long-run equilibrium relationships among the non-stationary variables used in this research. According to Engle and Granger [70] 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. The study applied the two maximal likelihood ratio tests (the maximal Eigen-value and the trace statistics), to determine the number of co-integrating vectors.

Table 1. Data Presentation on long-run OLS regression (Variables measured at Level)

lnRGDP = f(lnEXD, EDIC, NFXR , μ t)

Dependent Variable: lnRGDP

Method: OrdinaryLeast Squares

Date: 10/10/2023 Time: 10:03

Sample(adjusted): 1981 - 2022

Included observations: 42 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NFXR	0.150797	0.080432	1.874832	0.0642
lnEXD	-0.332548	0.080039	-4.154837	0.0001*
EDIC	0.051444	0.052462	0.980587	0.3294
R-squared Adj.R2 0.7341	0.841234	Mean dependent var		12.8144
S.E. of	0.215812	Akaike info criterion		0.00156
Sum squared resid	0.878366	Schwarz criterion		0.37633
Log likelihood	8.882122	F-statistic		101.0764
Durbin-Watson stat	1.065123	Prob(F-statistic)		0.000000

Source: E-View Econometric Computer Software Application, Version 6

Table 2. Summary of unit root test result data presentation

Variables	At Level		First Order Difference		Remarks
	ADF Test Stat	Order of Integration	ADF Test Stat	Order of Integration	
lnRGDP	-2.187932	-	-3.226143	/ (1)	**
lnEXD	-1.860776	-	-3.999801	/ (1)	***
NFXR	-2.451143	-	-3.378241	/ (1)	**
EDIC)	-2.254723	-	-4.170876	/ (1)	***
Note:	Critical Value:		Critical Value:		
	1%	= -3.6852	1%	= -3.6959	
	5%	= -2.9705	5%	= -2.9750	
	10%	= -2.6242	10%	= -2.6265	

* = 10% level of Significance ** = 5 % level of significance *** = 1 % level of significance .

Source: E-VIEW Econometric Computer Software application, Version 6

Table 3. Summary of johansen co-integration test results data presentation

Sample: 1981-2022

Included observations: 42

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)
0.937151	301.6113	118.22	123.48	None**
0.906043	202.2121	93.05	102.16	At most 1**
0.8744345	188.6456	66.42	74.57	At most 2**
0.278112	11.06121	14.21	19.16	At most 3

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 3 co-integrating equation(s) at 5% significance level

Source: E-View Econometric Computer Software application, (Version 6)

Table 4. Parsimonious error correction model data presentation

Series: lnRGDP = f(lnEXD, ,EDIC, NFXR,)
 Dependent Variable: DLn (RGDP)
 Method: Least Squares
 Date: 10/10/2023.Time: 12:56
 Sample (adjusted): 1981 2022
 Included observation:42 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	-2.010042	0.299051	-6.721402	0.0001
Dln(RGDP(-1))	0.404245	0.261621	1.545155	0.1352
DlnRGDP(-2))	-0.060011	0.014447	-4.153872	0.0004*
Dln(EXD(-1))	-0.084869	0.024577	-3.45318.	0.0012*
Dln(EDIC(-2))	-0.246828	0.091030	-2.711508	0.0080*
D(NFXR(-1))	-0.220378	0.328661	-0.620036	0.5471
DIN FXR(-2))	0.034430	0.013123	2.623637	0.0078*
ECM02(-1)	-0.154347	0.055848	-2.569044	0.0082*
R-squared	0.822312		mean dependent var	0.04321
Adjusted R-squared	0.765462		S.D dependent var	0.201003
S.E of regression	0.200243		Akaike info criterion	2.20222
Sum squared resid	0.702366		Schwarz criterion	0.11231
Log likelihood	-14.43524		F-Statistics	13.514032
Durbin-Watson stat	2.41233		Prob (F-statistic	0.00015

Source: E-view econometric computer software application, version 6

Table 5. Summary of data presentation on pairwise granger causality test

Sample: 1982 – 2022
 Date: 10 /10/2023 Time: 1.55
 Lags = 2
 Observation = 40 (After Adjusting Endpoints)

Null Hypothesis	F-statistics	Probability
Ln(RGDP) doesn't Granger cause ln(EXD)	0.41861	0.68288
Ln(EXD) doesn't Granger cause ln(RGDP)	0.34915	0.70896
Ln(RGDP)) does not Granger cause lnEDIC	3.84841	0.68288
Ln(EDIC) 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: E-View econometric computer software application version 6.

The summary of the results is presented on Table 3. The results confirm that there are three (3) co-integrating relationships at 5 per cent level of significance, since their values are greater than the critical values at 5 per cent significance. This result implies that the test statistics rejected the null hypothesis, which states that the variables are not co-integrated but accepted the alternative. This indicates that there is long-run relationship among the selected variables.

Johansen cointegration test is preferred to Engle-Granger co-integration test in that it permits cointegrating relationships among several non-stationary time series. The test is more generally applicable than that of Engle-Granger test, which

is based on augmented or Dickey-Fuller Unit root test on the residuals from a single (estimated) co-integrating relationship.

4.4 Analysis of the Parsimonious Error Correction Model Result

Table 4, presents the parsimonious Error Correction Model (ECM) result which gives the final and more precise estimation result when compared with the OLS level series model. All the variables are rightly signed and significant in accordance with the priori expectation, except EXD. The coefficient of determination ((R²) (0.82) which measures the overall goodness of fit is still significantly high. The indication is that 82 per

cent of variations in RGDP is determined by the aggregate variations in the selected explanatory variables in the long run. The F- statistics ratio of 13.5 is still significant, indicating that the selected explanatory variables are collectively important in explaining the variations in RGDP in Nigeria. The Durbin-Watson statistics test ratio of 2.4122 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 rate 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 longterm projects. Exchange rate depreciation will increase the cost of interest charges on external debt since both the principal and the charges are paid in foreign currency of the creditor.

Theoretically, an exchange rate overvaluation could also 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, in practical terms, for a developing economy like Nigeria with high inflationary tendency, both overvaluation and undervaluation are inimical to growth [81].

Overall, since external debt and its interest charges have negative and significant relationship with RGDP, they are not contributing to the growth of Nigeria's RGDP. This could be attributed to improper direction of the debt capital to non-productive sector of the economy, in addition to excessive increase of interest charges on debt.

Furthermore, keeping other variables constant, the model shows that one percent increase in nominal FXR induces 3.5% reduction on RGDP annually while one percent increase in external debt and its interest charges induce 8% and 24% reduction in RGDP respectively. This indicates that EDIC overhang and EXD have more devastating effect on the real economy.

The lag of the dependent variable (RGDPt-2) was equally significant in explaining the effect of the explanatory variables on RGDP. The effect reflected inter-temporal dependence of RGDP, with the level of RGDP1-t at any one period, determining the level in another.

The coefficient of the ECM term (-0.154347) which measures the speed of the adjustment at which equilibrium is restored, is significant and rightly signed (negative) at 5 percent level. This confirms the earlier proposition that the variables are cointegrated [69].

The same ECM coefficient also gives the proportion of the short run disequilibrium in the explanatory variables which was accumulated in the previous period and corrected in the current period. The speed implies that in the long run, 15 per cent of the shorrun disequilibrium of RGDP in Nigeria is corrected within a lag, during the period under review. (One lag is one year in this study). This suggests that in the longrun, RGDP in Nigeria adjusts slowly to short run disequilibrium changes in the selected explanatory variables. It implies lag effect. (Gujarati and Porters [69]. The findings collaborates with that of Adeyemi [32] and Kayadi, Opara, Zwingina, and Okon [82].

4.5 Summary of Pairwise Granger Causality Test Analysis

The essence of this test is to establish the direction of causal relationship between RGDP in Nigeria and the selected explanatory variables. It was run on the model with optimal lag of 2. The test is preferred to traditional correlation method which measures only relationship without direction. Establishing which variable deteriorates or promotes the other, will enhance effective economic planning, especially in determining the relative weights to be assigned to these macroeconomic variables to achieve a sustainable economic growth.

The summary of the result is presented on Table 5. The F-statistics ratios and their probability values are applied, at 5 percent level of significance, to determine the existence of unilateral, bilateral and independent causal relationships between RGDP and the selected explanatory time series. NFXR has unilateral causal relationship with RGDP without a feedback. Independent causality runs between EXD and RGDP implying none of the variables determined each other. Likewise EDIC with RGDP.

The general results imply that direction of causal relationships between RGDP and the selected explanatory variables are mixed. However, it agrees with the findings of Kara and Pentecost [83] and Konya [84], which show that causality

tests are mixed and inconclusive depending on the variables used.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between external debt and the real economic growth of Nigeria, which spans from 1981 to 2022. The study used external debt, external debt interest charges and nominal foreign exchange rate as explanatory variables and RGDP as the dependent variable. The overall import of the results and analysis imply that the selected explanatory variables have adverse effect on RGDP. This was determined by significant inverse relationship of external debt and external debt interest charges with RGDP and significant positive relationship of nominal FXR with RGDP. The result in relation to exchange implies high rate of depreciation.

Overall, the findings suggest that the selected variables for the study are not contributing to the growth of RGDP in Nigeria.

Based on the above findings, the study recommends as follows:

- i. The 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 external debt interest charges since both debt capital and its charges are paid in foreign currency of the creditor, Depreciation of Naira would have encouraged exportation but Nigerian government has neglected the diversification to non-oil real sector resources but concentrates more on crude oil exportation
- ii. More emphasis should be laid on managerial debt efficiency and monitoring to encourage channeling of external debt to their tied specific productive projects, This strategy will enhance income in order to meet up with debt service charges. If borrowed funds are effectively utilized on productive investment, it will enhance economic growth and development, since employment and the welfare of the citizenry will improve.
- iii. In most developing countries (Nigeria inclusive), fiscal policy focuses extremely on short-term goals but not guided by clear

middle-term/long-term goals strategy. This lack of anchoring has resulted in frequent breaches of fiscal rules and ever-increasing external debt levels. A strategic approach to fiscal policy should be properly implemented by applying clear middle-term/long term goals to circumvent increasing external debt and its interest charges burden.

- iv. Reliable debt data are also a prerequisite for effective debt management, which enhances economic growth. Nigerian government lacks the appropriate human and technical capacity to handle public resources and liabilities effectively, in addition to preparing risk analysis and debt strategy. Furthermore, another significant challenge for managing debt in Nigeria is weak capacity for debt data recording and reporting. The Debt Management Office (DMO) should effectively address the problem in order to maintain effective debt management. Analysis of risk, recording and reporting reliable debt statistics for policy making and implementation are very important. The DMO can make use of Debt Management and Financial Analysis System (DMFAS).
- v. According to DMO [85] recent report titled "Market Access Country-Debt Sustainability Analysis" for 2022, Nigeria's debt service-to-revenue ratio in 2022 stands at 73.5%, and this figure is very outrageous. It implies debt unsustainability and threat. If external debt is properly channeled to appropriate productive projects, there would be no cause for rescheduling of debt, which increases debt service charge. Diversification to non-oil sector will also increase export revenue to enable the government meet up with the creditor's obligation within the stipulated maturity period [86].
- vi. Finally, since there is a confirmation of lag effect, the Policy makers should design policies that would match the magnitude of the expected changes in order to counter the lag effect

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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