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External Debt and Nigeria's Economic Growth: Determinants and Implications

Abimbola Oluwaseyi Ademola *

Abstract: *Nigeria's economy has been largely dependent on external borrowing, which has resulted in an increasing debt burden. Policymakers and economists have debated the influence of external debt on economic growth. Therefore, this study analyzed how external debt affects Nigeria's economic growth and explored the factors that determine external debt in the nation. The study utilizes an Ex Post Facto research design, and data from the Central Bank of Nigeria and the World Bank report from 1990 to 2020 was used. Vector error correction regression model, granger causality test, unit root and co-integration tests were employed for the analysis. Findings revealed that external debt servicing, exchange rate and external debt have significant but adverse effect on economic growth, confirming the debt overhang effect. However, external reserves portends positive and significant effect on GDP. Moreover, empirical results revealed that trade openness, government expenditure, inflation and exchange rates are salient factors that affect external debts in Nigeria. In terms of causality, all the tested variables have causal relationship with external debt. The study recommends that Nigeria government needs to adopt a sustainable borrowing and debt management strategy to avoid excessive external debt accumulation and its negative implications for the economy.*

Keywords: Economic Growth, External Debt Servicing, Exchange Rate, Inflation.

Introduction

Developing nations often face resource constraints that hinder their ability to invest in crucial infrastructure, which in turn limits their potential for long-term economic growth (Rahaj, 2018). This is due to various factors, such as inadequate tax structures, tax base, and unpredictable fluctuations in commodity prices, which result in insufficient tax revenue and proceeds from natural resources to support sustainable development. Consequently, many emerging countries resort to deficit spending to cover public expenditures and address funding gaps resulting from tax revenue shortfalls.

Nigeria, like many other developing economies, uses deficit spending as a means of promoting capital formation and long-term production growth. Various research studies have suggested that a nation's economic prosperity can benefit from public spending financed through either domestic or foreign borrowing. This funding can help finance investments and deficits in balance of payments. Ayadi and Ayadi (2008) has argued that

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in order to achieve sustainable economic growth and boost Nigeria's GDP per capita, the country should raise its external debt to promote collective investment and overcome limitations in government budget funding. External debt is defined as funds obtained from overseas lenders, including corporate banks, governmental bodies, or global financial organizations.This borrowing may accumulate over time and creates a legal obligation to repay the funds at a later date.

Nigeria obtained its initial loan from its colonial ruler in 1958 to support the construction of railways prior to gaining independence. Subsequently, in 1962, Nigeria utilized foreign loans to support its inaugural economic plan (Oshikoya, 1989). Following the reduction in commodity prices in 1978, Nigeria borrowed additional funds to finance various public works and initiatives aimed at enhancing the quality of life of its people. As stated by the Central Bank of Nigeria (CBN, 2019), Nigeria has accumulated different types of debts from foreign sources, which comprise the Paris Club of Creditors, the London Club of Creditors, Multilateral Creditors, Promissory Note Creditors (refinancing of unpaid trade arrears without insurance), Bilateral Creditors, and Private Sector Creditors. These overseas funding sources are utilized to support various projects like the Nigeria Railway Modernisation Project. (Idu-Kaduna and Lagos-Ibadan Sections), Nigeria Abuja Light Rail Project, Nigeria ICT Infrastructure Backbone Project, Nigeria Four Airport Terminals Expansion Project and Nigeria National ICT Infrastructure Backbone Phase II Project among many others.

Although it may seem reasonable to obtain loans from external sources, relying on such borrowing has become a constant burden that has resulted in serious economic consequences for both present and future generations of Nigerians. This has led to a significant decline in living standards, increased dependence on external sources, and a reduction in socio-economic investment, currency devaluation, balance of payment issues, exchange rate devaluation, and a rise in inflation rates (Ijirshar, Joseph, & Godoo, 2016). Nigeria's enormous debt load poses a significant hindrance to the creation of jobs and economic advancement since money intended for productive purposes may be frequently diverted to pay off external debt obligations. For example, in the period from January to September 2021, Nigeria has spent more than US$1.82 billion to service its external debts (DMO Report, 2021). This amount is more than a quarter of Nigeria's total revenue for the year 2021, as shown in Figure 1.

Furthermore, Nigeria's external debt increased from $71 billion in December 2017 to $74.28 billion by the close of the first quarter of 2018. From the beginning of 2015 to December 2020, the country's overseas debt surged from $9.7 billion to $27 billion. In terms of economic performance, Nigeria had an average growth rate of 6.1% between 2010 and 2014, but it declined to -1.6% in 2016. The economy's growth rate remained negative at -1.9% between 2018 and 2020 (Aiyedogbon, Zhuravka, Korneyev, Banchuk-Petrosova, & Kravchenko, 2022) This suggest that a significant portion of the country's resources is being utilized for non-productive activities, which could impede Nigeria's progress and potentially lead to a severe debt crisis.

Due to the persistent concern over Nigeria's increasing external debt burden and the accompanying high debt service payments, it is imperative to analyze the key factors that contribute to this situation. This is crucial because understanding the determinants of ex-

ternal debt can provide valuable insights into how to manage a country's debt, minimize debt vulnerabilities, and promote sustainable economic growth. Previous research has identified several common determinants of external debt, including economic growth, imports, population, foreign exchange reserves, total debt service, poverty, income instability, currency devaluation, budget deficit, exchange rate, and trade openness, as noted by Adamu (2019); Brafu-Insaidoo, Ahiakpor, Vera Ogeh, and William G (2019). By investigating these determinants, negative consequences can be avoided. Therefore, this study aims to explore the determinants of external debt in Nigeria.

The relationship between external debt and economic growth is a complex and widely debated issue. While external debt can provide funding for investment and growth-boosting activities, excessive levels of external debt can also be a significant burden on a country's economy, hindering long-term economic growth. Previous studies on the association between external debt and economic growth have yielded conflicting outcomes. For example, Ndubuisi (2017) argued that external debt influences economic growth positively, while (Onyele & Nwadike, 2021) established an adverse relationship. However, Ohwofasa, Nana, and Kumapayi (2012) did not establish any association between external debt and economic growth in Nigeria.

This study seeks to address the inconsistencies in previous research findings by investigating how external debt affects economic growth and the factors contributing to external debt in any nation. Given that Nigeria is a developing country, it is critical to understand the implications of external debt on the economy and identify appropriate measures to eliminate or reduce this debt and its adverse consequences. This study provides important insights into this phenomenon. Prior to this research, few researches focused on the effect of external debt on Nigeria's economic growth and the determinants of external debt. As a result, this work makes a significant contribution to knowledge in this field. The paper is organized as follows: review of the literature is presented next, followed by the methodology of the study. The fourth section contains the results and discussion, while the final section reports on the conclusions and policy implications.

Literature Review

Conceptual Review

External Debt

External debt refers to money borrowed from sources outside a country's borders. It comprises debt obligations that are incurred from external sources in the form of financial, technical, and managerial support. These debts are defined and repaid in foreign currency at a later time. Countries often borrow externally because they lack the local savings necessary to fund their economic activities. These loans are intended to stimulate domestic savings and finance productive endeavors (Ezeabasili, Isu, & Mojekwu, 2011). Furthermore, a country may obtain short-term financing from external sources to address current account deficits resulting from external disruptions, thereby strengthening its position in external reserves and improving its future external liquidity position (Zaheer, Khaliq, &

Rafiq, 2019). External borrowing has the potential to promote economic growth, if it is utilized to enhance the productive capacity of the economy.

A considerable proportion of Nigeria's external debt is owed to the Paris Club, which is made up of fifteen creditor nations. The Paris Club loans are either government-to-government loans or market-based term loans that are secured by the export credit agencies of the lenders' countries. The Paris Club functions as forum for countries experiencing difficulties with official debt repayments to engage with creditors and discuss debt restructuring. It is a temporary and informal organization that operates based on agreement. Nigeria owes money to the following Paris Club members: Australia, USA, Spain, Israel, France, Switzerland, Germany, Denmark, Italy, Netherlands, Japan, UK, Belgium, Russia, and Finland. Foreign debt is an essential source of funding that countries use to supplement their domestic funding for development and other purposes. However, if the loans are not invested in profitable and productive ways, the capacity of the borrowing nation to repay the debt raises issues, ultimately resulting in significant debt problems for the country.

Economic Growth

This pertains to the progressive increase in a country's per capita output, along with growth in its workforce, spending level, resources, and amount of trade (Ijirshar et al., 2016). However, maintaining and promoting these sectors is challenged by a deficit of local resources, savings, and investment, causing a mismatch between the amount of savings and investment and hindering a country's economic growth (Imimole & Imuoghele, 2012). Consequently, income is more effectively redistributed between society and the population.

Theoretical Review

Dual-Gap Theory

This theory suggests that investment is a vital element of development, but domestic savings are often inadequate to sustain progress. Therefore, governments utilize methods to attract foreign investments to generate the necessary investment levels and promote economic growth. In some cases, an equivalent amount of money (Gap) may be borrowed and invested, and loans from external sources can supplement a developing country's local resources. Underdeveloped economies experience lower growth rates due to their inability to provide financial support for investment in all sectors of the economy. Savings and investment also play a crucial role in promoting and maintaining economic development.

Sachs (2002) stated that achieving sustained economic growth may be challenging until the capital level surpasses a certain threshold. Foreign loans can promote spontaneous economic expansion, leading to increased investment and capital growth. This scenario exemplifies the dual gap theory, which highlights the significance of external borrowing. The main factor to consider when applying for a loan from an external source is to make sure that the borrowed money can yield greater profits than the interest expense

when invested. Consequently, investing the loan in productive activities can enhance the productivity of borrowing countries. This theory is critical to this study because it underscores the importance of external loans and other forms of capital inflows in financing investments and supplementing a nation's limited financial resources.

Debt Overhang Theory

Brady and Magazzino (2018) propose that if a country's debt becomes too high and exceeds its ability to repay, it can impede investments and hinder economic growth. Debt overhang occurs when a country's debt is so substantial that it is unable obtain additional loans to fund new projects. Coccia (2017) explains that public debt and debt service affects economic growth by prioritizing debt repayment over other expenses. Unrestrained public borrowing affects the economy in two ways. The first is the crowding-out effect, which leads to an increase in interest rates. The second is an increase in interest payments, which can cause a country's budget deficit to rise. Significant debt service payments can hamper growth by lowering productive public spending, which is crucial for stimulating growth (Yusuf & Mohd, 2021).

Empirical Review

Effect of external debt on economic growth

Different studies have produced conflicting results regarding how external debt affects economic growth. Ayomitunde (2020) investigated Nigeria's economy and concluded that external debt has an adverse effect on economic growth. Meanwhile, Ugwuanyi, Ugwuanyi, Efanga, and Agbaeze (2021) studied the correlation between external debt management and Nigerian economic growth using GDP as a measure of growth, and analyzed external debt service, balance of payments, foreign debt, and exchange rate. Their results indicate that external debt management had favourable effect on Nigeria's economy, using the OLS regression technique.

Onyele and Nwadike (2021) examined the effect of Nigeria's public debt burden on economic growth using the Autoregressive Distributed Lag (ARDL) model. They found that debt burden, revenue adequacy, reserve adequacy, and exchange rate affected economic development adversely in the long run. However, in the short term, changes in income and reserve adequacy had a favorable effect on economic growth, while changes in debt burden had an adverse effect. Similarly, Getinet and Ersumo (2020) used the ARDL approach to investigate Ethiopia's situation, analyzing data from 1983 to 2018. They discovered that there is a long-term correlation between external debt services to GDP, but while the considerable but adverse relationship exist in the short term, it was contrary in the long term.

Awan and Qasim (2020) also investigated how external debt and external debt services affect Pakistan economic growth, and their findings indicate that both adversely affect the Pakistani economy due to the burden of repayment in foreign currency. El Aboudi and Khanchaoui (2021) used the ARDL estimation technique and demonstrated that external debt adversely affected economic growth. Antoine, Stanislas, and Rollfe (2021) affirmed

that external debt positively affected economic growth in Congo. Elhendawy (2022) conducted a study using data spanning from 1980 to 2019. The results showed that there is a long-term adverse correlation between Egypt's national currency and external debt service. This suggests that external debt service has a detrimental effect on Egypt's resources. Rawat (2019) analysed the link between external debt, domestic debt and economic growth for Pakistan from 1987 to 2018 using fully modified ordinary least squares model. Empirical findings suggested that there exist a negative relationship between economic growth and debt whether it is external or domestic, thereby confirming the debt overhang theory

Determinants of external debt

Brafu-Insaidoo and colleagues (2019) conducted a study in Ghana that aimed to analyse the factors influencing foreign debt between 1970 and 2012. They utilized an ARDL model and found that while trade openness decreases short-term debt, economic growth increases it. Similarly, Azolibe (2021) conducted a study that examined the determinants of external debt for 39 heavily indebted poor countries (HIPCs) from 1996 to 2018. Using the panel fully modified ordinary least squares method, the study revealed that corruption, government spending, and population growth increase external debt, while economic growth decreases it.

Adamu (2019) conducted research to investigate factors influencing Nigeria's external debt and he concluded that external debt favorably affected oil price, domestic savings, exchange rate, debt relief, and fiscal deficits. Meanwhile, in 2020, Fatukasi et al. utilized the fully modified ordinary least squares method and data from 1981 to 2018, and found that debt servicing and trade openness were negatively associated with external debt in Nigeria. Another study by Beyene and Kotosz in 2020 employed the ARDL model using a dataset covering 1981 to 2016. It was revealed that external debt in Ethiopia portend favorable correlation with saving-investment gap, trade deficit, fiscal deficit, and debt servicing, but was minimized by growth rate of GDP, trade openness, and inflation.

Methodology

Research Design

The study employed ex-post facto research design and relied on secondary data to accomplish its objectives. The data set comprised of annual time series data spanning 30 years (1991-2020) corresponding to Nigeria's 4th republic, a period of uninterrupted governance. Data were sourced from the Central Bank of Nigeria and the World Development Indicators database. The study utilized several methods for data analysis including the Augmented Dickey Fuller (ADF) unit root test to determine variable stationarity, as well as the Johansen co-integration model, Vector Error Correction model (VECM), and correlation matrix. Table I highlights the variables employed in the study.

Table 1
Measurements of variables

S/n	Variables	Abb.	Measurement
1	External Debt	ED	Total external debt to gross domestic product
2	External Debt Service	EDS	Total debt service on external debt
3	External Reserves	ERS	Total reserves expressed in percentage of total external debt
4	Exchange rate	EXR	Annual average Naira against US Dollar
5	Inflation rate	INF	Annual average consumer price index
6	Trade Openness	TOP	Sum of exports and as a share of gross domestic product
7	Government Expenditure	GEX	General government final consumption expenditure as a share of gross domestic product
8	Economic growth (Gross Domestic Product)	GDP	Total value of all goods produced in a country in a year

Source: Author's computation, 2022

Model Specification

To analyze non-stationary co-integrated series and consider short-term dynamics adjustment while monitoring the long-term relationship between endogenous variables towards co-integration convergence, the VEC model was created as a bounded VAR model. The model examines the effect of external debt on economic growth and is expressed as follows:

$$lnRGDP_t = \beta_0 + \beta 1 lnEDS_{t-1} + \beta_2 lnEXR_{t-1} + \beta_3 lnERS_{t-1} + \beta_4 lnED_{t-1} + \mu_t \quad (1)$$

$$RGDP = \beta_0 + \beta_1 EDS + \beta_2 EXR + \beta_3 ERS + \beta_4 ED$$

The equations for external debt model in VECM form was specified as follows:

$$\Delta lnRGDPt = \beta_0 + \beta_1 \Delta lnEDS_{t-1} + \beta_2 \Delta lnEXR_{t-1} + \beta_3 \Delta lnERS_{t-1} + \beta_4 \Delta lnED_{t-1} + \mu_t \quad (2)$$

Where; RGDP = Gross Domestic Product representing economic growth; EDS = External Debt Servicing; EXR = Exchange Rate; ERS = External Reserve; ED = External Debt; μ= Stochastic error term; Δ = Difference Operator; ECT = Error Correction Term; β_0= intercept or constant parameters.

Note: Expected signs of the coefficient (a priori expectation) β_1, β_2, β_3, $\beta_3 < 0$

The second model representing the determinants of external debts is as follows:

$$EXD_t = \beta_0 + \beta_1 INFt + \beta_2 lnTOP_t + \beta_3 lnGEX_t + \beta_4 lnEXR_t + \mu_t \quad (3)$$

Where: INF= Inflation rate; TOP = Trade openness; GEX = Government expenditure; EXR = Exchange rate; β_1 - β_5 are parameter estimates for the independent variables μ_t = Error terms; β_0 = intercept; t = number of years.

Results and Discussions

Table 2
Augmented Dickey-Fuller and Phillip-Peron Unit Root Test

	ADF Unit Root (ADF)			Philips-Perron (PP)		
	First Difference			First Difference		
Variables	**T-Statistics**	**P- Value**	**Remarks**	**T-statistics**	**P -value**	**Remarks**
RGDP	-4.228435	0.0026**	I(1)	-4.206962	0.0027**	I(1)
ER	-5.064272	0.0003***	I(1)	-5.06533	0.0003***	I(1)
ED	-3.814893	0.0072**	I(1)	-3.829102	0.0072**	I(1)
EDS	-4.466416	0.0014**	I(1)	-4.429922	0.0016**	I(1)
ERS	-5.235684	0.0002***	I(1)	-4.708714	0.0008***	I(1)

Note: *, **, and *** represent 10%, 5%, and 1% level of statistical significance.
RGDP= Gross Domestic Product; EDS = External Debt Servicing; CR= Currency Rate; ERS = Foreign Reserve, ED = External Debt

Table 2 presents the outcomes of the unit root tests utilizing Augmented Dickey Fuller and Phillips-Perron, which is necessary to determine the appropriate estimation technique for the research. The results indicate that both ADF and PP methods yielded comparable findings. The ADF values remained constant at the initial difference 1(1), indicating stability. The PP statistics demonstrated that all variables examined were stationary at the first difference 1(1). The subsequent stage of the investigation involves conducting a co-integration test, which is necessary for VECM analysis. Co-integration tests are utilized to verify the existence of a potential long-term equilibrium association between two variables.

Table 3
Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.798739	96.68893	69.81889	0.0001
At most 1 *	0.665923	50.19755	47.85613	0.0296
At most 2	0.334795	18.40241	29.79707	0.5365
At most 3	0.126936	6.580261	15.49471	0.6269
At most 4	0.087128	2.643623	3.841466	0.1040

Table 3 shows that the trace statistics (96.68893) are higher than the critical value (69.81889) at a 95% confidence level. As a result, the null hypothesis is rejected. Additionally, at a 5% lag order selection, there are three possible co-integrating equations among the variables. Therefore, the null hypothesis that there are no co-integrating relationships is also rejected. The study proceeds with the VECM estimates on the basis of unit root and co-integration analysis, using the Lag Order Selection (LOS) criteria to determine the best lag. Table 4 displays the results of the VECM Lag Order Selection Criteria. Table 5 shows that four (LR, FPE, AIC and HQ) out of the five statistical requirements supported lag 2. Therefore, lag 2 is adopted for the autoregressive process in the VECM.

Table 4
VECM Lag Order Selection Criteria Result

Lag	Log	Sequential Modified LR test statistic	Final Prediction Error (FPE)	Akaike Information Criterion (AIC)	Schwarz Information Criterion (SIC)	Hannan-Quinn Information Criterion (HQ)
0	-125.8328	NA	0.005706	9.022950	9.258691	9.096781
1	4.409166	206.5907	4.14e-06	1.764885	3.179329*	2.207871
2	35.47585	38.56553*	3.23e-06*	1.346493*	3.939641	2.158635*

Note:* indicates lag order

Table 5
Vector Error Correction Model Result

Variables	Coefficient	Std. Error	t-Statistic	Prob.
ECT	-0.250533	0.118105	-2.121273	0.0499
RGDP(-1)	0.500685	0.206129	2.42899	0.0273**
RGDP(-2)	-0.285556	0.185001	-1.543538	0.1422
ERS(-1)	0.014426	0.107407	0.134315	0.8948
ERS(-2)	0.315363	0.113926	-2.768138	0.0137**
EDS(-1)	0.306473	0.086627	3.537828	0.0027***
EDS(-2)	-0.219542	0.050659	-0.385761	0.0048***
ED(-1)	-0.096656	0.114194	-0.846425	0.4098
ED(-2)	-0.349811	0.128616	-3.497329	0.0030**
ER(-1)	-0.103047	0.109869	-0.93791	0.0622
ER(-2)	-0.215543	0.111731	-1.929124	0.0716*
C(12)	0.130122	0.044531	2.922053	0.0100***
R-squared	0.659955	Mean dependent var		0.078653
Adjusted R-squared	0.526175	S.D. dependent var		0.175689
S.E. of regression	0.133087	Akaike info criterion		-0.898105
Sum squared resid	0.283393	Schwarz criterion		-0.32716
Log likelihood	24.57347	Hannan-Quinn criter.		-0.723561
F-statistic	2.822967	Durbin-Watson stat		1.531885
Prob(F-statistic)	0.029248			

The negative Error Correction Term (ECT) coefficient, displayed in Table 5 above, was significant but had a negative sign. It is necessary for a VECM to meet these two requirements for proper functioning. Therefore, the model has long-term convergence, as indicated by the negative ECT coefficient. The R2 value of 0.659 and adjusted R2 value of 0.526 indicate how much variation can be explained by the independent variables. The Durbin-Watson statistic of 1.531 indicates favorable correlation between the specified variables. Furthermore, the F-stat of 2.822 and a P-value of 0.029 suggest that the model is closely linked to real GDP and effectively explains it. Results showed that ER, EDS, and ED have considerably adverse effect on GDP, while ERS positively affected Nigeria's economic growth.

Results in Table 5 indicate that ERS affects GDP favorably. Specifically, when ERS is increased at lag 2, there is 31.5% increase in GDP, suggesting that increasing ERS could lead to greater economic growth in Nigeria. Foreign reserves refer to the assets that a nation's monetary authorities hold to finance balance of payments requirements and intervene in exchange rate markets to ensure currency stability and payment systems. In Nigeria, foreign reserves have additional advantages such as providing a safety net for oil market shocks and instability, enhancing Nigeria's creditworthiness and serving as cushion during times of unexpected natural calamities (Johnny & Johnnywalker, 2018). The outcome is in line with the general belief that effective management of foreign reserves can play a crucial role in promoting Nigerian economy. This discovery corroborates the

findings of Kashif and Sridharan (2015), who observed a substantial positive influence of holding foreign reserves on long-term economic growth in Malaysia, India, and Brazil, respectively.

Despite being negative, the ED coefficient is significant, indicating that a unit increase in external debt at lag 2 leads to a 35% decrease in GDP. This negative relationship is consistent with expectation and the debt overhang hypothesis, suggesting that the government has not effectively utilized external borrowing to expand the productive base of the economy, which is necessary for achieving sustained economic growth. These results have implications for public policy, supporting the need for external debt reduction to promote long-term economic growth in Nigeria. Similar findings were reported in studies conducted in India, Oman, and South Africa by Saxena and Shanker (2018); Kharusi and Ada (2018) accordingly.

The study showed that changes in exchange rates at lags 1 and 2 have a significant negative effect on GDP, with a unit change in exchange rate variation affecting GDP by 21.5% at lag 2. The implication is that a rise in external debt leads to currency devaluation, which subsequently affects GDP. This outcome corroborates the viewpoint proposed by Onafowora and Owoye (2019) regarding the link between exchange rate fluctuations and external debt. It was discovered that servicing external debt adversely affected GDP, with a 1% increase in debt service expenses resulting in a 21.95% drop in GDP at lag 2. Debt servicing drains resources from the government, reducing revenue available for investment and affecting economic growth adversely.

This result corroborates crowding-out hypothesis, which suggests that debt service costs adversely affect economic growth. This can be attributed to the fact that resources allocated for servicing debt signify a loss of crucial foreign exchange that could have been utilized for constructive investments in infrastructure, ultimately hindering economic development. DMO (2021) report shows that Nigeria paid over US$1.82 billion on debt servicing, indicating that the government should exercise caution when borrowing and only use loans for constructive purposes, as debt servicing adversely affect economic growth.

Table 6
Summary of unit root test using Augmented Dickey-Fuller.

Variables	ADF test statistics	P- Value	Level	Remarks
lnEXD	-3.241984	0.0226**	I(1)	S
INF	-5.72338	0.0134**	I(1)	S
lnTOP	-4.814893	0.0052**	I(1)	S
lnGEX	-3.511661	0.0122**	I(1)	S
lnEXR	-2.452207	0.0076**	I(1)	S

EXD - External debt, INF= Inflation rate; TOS = Trade openness; GEX = Government expenditure; EXR = Exchange rate
*10% significance level, ** 5% significance level

Table 6 presents the outcome of a unit root test which aimed to check the stationarity of the variables under investigation and prevent false regression. The test utilized the Augmented Dickey-Fuller method. According to the results, all variables exhibited stationarity after undergoing a first level difference. This indicates that the variables meet the requirement for Fully Modified Ordinary Least square.

Table 7
Summary of regression results

Variables	Coeff.	Std.Error	t-stat	Prob
C	4.65276	1.75642	3.16579	0.0017
INF	0.87459	0.14456	2.35582	0.0236**
lnTOP	-1.25881	0.7238	-1.49118	0.0455**
lnGEX	1.28741	0.81346	1.49866	0.0033**
lnEXR	0.51135	0.13434	3.376651	0.0487**
R-square	0.70234		F-statistic	7.7866
Adjusted R-Square	0.51766		Prob(F-statistic)	0.0023

Dependent variable: EXD – External debt
INF= Inflation rate; TOS = Trade openness; GEX = Government expenditure; EXR = Exchange rate. *10% significance level, ** 5% significance level

Table 7 displays the results of the regression analysis. The model estimated that the predictors accounted for 70.2% of total variation in EXD in Nigeria, R2 was 0.702. The adjusted R2, which measures the model's goodness of fit, was 0.517, indicating that the model was a good fit. Consequently, all the explanatory variables under investigation were excellent predictors. The F-stat was 7.786, with a value of 0.0023, indicating that the model was significant. As a result, the explanatory variables had joint influence on EXD in Nigeria during the period studied.

Results demonstrated that inflation (INF) substantially and positively affected external debt (EXD), suggesting that a rise of 1% in INF corresponds to 0.87% rise in EXD. This implies that EXD increases as, INF rates rises. Though, Dawood, Biqiong, Al-Asfour, and Nilofar (2021) argued that INF can reduce a country's debt, and as inflation rates increase, it can put pressure on exchange rates. To uphold a stable exchange rate, a nation may have to take out loans in foreign currency, which could result in the buildup of foreign debt. This finding aligns with the arguments made by Beyene and Kotosz (2020); Dawood et al. (2021), who all suggested that INF affect external debt positively.

According to the results, the TOP coefficient had a significant negative impact at a 5% significance level. This suggests that as trade increases, external debt decreases. This is logical because TOP facilitates more exports, leading to buildup of foreign currency and decrease in external debt. In Nigeria, trade liberalization has resulted in minimizing external debt by eliminating trade barriers and promoting free trade, which brings economic advantages like technology and skills transfer, improved labor productivity, and economic development. Therefore, TOP is an important factor that affects external debt in Nigeria, the finding aligns with previous studies by Beyene and Kotosz (2020), but it is in contrast to Dawood et al. (2021), who reported that TOP positively affect EXD.

The GEX coefficient is both significant and positive, indicating that a 1% increase in GEX leads to a 1.28% increase in EXD in Nigeria. This suggests that when the government spends more than it generates in revenue, it may resort to borrowing to cover the deficit. This tendency to borrow may also be due to the need to finance government expenditures when there are no available funds. Consequently, increasing EXD. For example, in Nigeria, the government borrows heavily to address security issues in the Northern part of the country, leading to a rise in external indebtedness. Studies conducted by Dawood et al. (2021) also reveal that high levels of government spending drive external debt.

The EXR coefficient shows a noteworthy and optimistic correlation indicating that a

country's external debt rises as its exchange rate increases. Nonetheless, an upsurge in EXR results in a decrease in GDP. This is because when a country's exchange rate climbs, its domestic currency's value declines, and more funds become necessary to repay the debt. The devaluation of the domestic currency amplifies the value of the debt. As a result, EXR is a critical factor influencing EXD, which aligns with previous researches conducted by Udoh and Rafik (2017); Adamu (2019).

Table 8
Granger Causality Test

Null Hypotheses	F- Statistics	Prob.
INF does not granger cause EXD	4.7634	0.0257**
EXD does not granger cause INF	2.1544	0.0863*
TOP does not granger cause EXD	3.6438	0.0614*
EXD does not granger cause TOP	1.4436	0.2432
GEX does not granger cause EXD	3.7784	0.0422**
EXD does not granger cause GEX	4.2366	0.0211**
EXR does not granger cause EXD	4.9954	0.0045**
EXD does not granger cause EXR	2.0337	0.1877

Table 8 shows the results of the Granger causality test, which was carried out to establish a causal connection between the predictors. Results indicates that INF has a two-way causal relationship with EXD. At 5% significance level, INF has a Granger-causal effect on EXD, whereas EXD Granger-causes INF at 10% significance level. This corroborates the earlier finding that INF has a meaningful and favorable effect on external debt, indicating that high INF is disadvantageous to an economy since it results in the accumulation of debt.

Furthermore, there is a one-way causal relationship between TOP and EXD, where TOP causes EXD at 10% significance level, but not the other way around. This causal relationship reinforces the earlier finding that TOP has an adverse association with EXD. Additionally, the results demonstrate that there is a two-way causal relationship between GEX and EXD at 5% significance level. This suggests that GEX prompts an increase in EXD in Nigeria during the study period. Conversely, EXR exhibits a one-way causal relationship with EXD, indicating that EXR causes changes in EXD, and not vice versa.

Conclusion and Recommendations

This study analyzed how external debt affects Nigeria's economic growth and explored the factors that determine external debt in the nation. The study utilizes an Ex -Post Facto research design, and data from the Central Bank of Nigeria and the World Bank report from 1990 to 2020 was used. Vector error correction and regression models, granger causality test, unit root and co-integration tests were employed for the analysis. Findings revealed that three of the tested variables external debt servicing, exchange rate and external debt substantially but adversely affected Nigeria's economic growth, confirming the debt overhang effect. However, external reserves portends positive and significant effect on GDP. Moreover, empirical results revealed that trade openness, government expenditure, inflation and exchange rates are salient factors influencing external debts in

Nigeria. In terms of causal relationship, all the tested variables have causal relationship with external debt.

Policy Implications and Suggestions for Further Studies

The outcome of the study have practical implication for making financing and investing decisions, and they are crucial for figuring out whether a fiscal strategy that boosts public debt would lead to lower living standards in the future or not. These findings are expected to aid decision-makers in devising public debt plans that promotes Nigeria's economic growth while freeing up funds for government spending. Additionally, it is suggested that ECOWAS and other Sub-Saharan African countries conduct similar research since they have similar economic frameworks and developmental phases.

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