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**Research Article**

**External Debts and Economic Growth: Evidence from Nigeria**

**Olamide Irete Olasehinde<sup>a</sup> & Olusesan Samuel Afolabi<sup>b</sup>**

**Abstract**

This study examined the relationship between external debts and economic growth for sustainable capacity building in Nigeria, using annual time series data spanning from 1981 to 2022. Autoregressive Distributed Lag (ARDL) Bound technique, ARDL cointegration form and Granger causality were employed for the research analysis. The results of the study confirmed that there was evidence of long-run relationship among the variables employed in Nigerian economy. The study discovered that only foreign reserves (FRES) has positive and significant long-run impacts on economic growth (GDP). The results showed that none of the variables has significant short-run impacts on Nigerian economy growth. The Granger causality revealed that it is external debt and interest rate that granger caused economic growth (GDP), while (GDP) granger caused only openness of trade. A bidirectional causality was established between openness of trade and economic growth within the period of study. Based on the research findings, the study recommends that government should discontinue from taking unproductive loans and bonds in order to reduce excessive debt servicing in order to sustain capacity building at all levels and to encourage trade openness to boost internal and external trade in order to enhance sustainable growth and development of the country.

*Keywords:* external debt, economic growth, Autoregressive Distributed Lag model, Pairwise Granger Causality techniques.

*JEL Codes:* C20,C58,H50,H60,O40

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**Araştırma Makalesi**

**Dış Borçlar ve Ekonomik Büyüme: Nijerya'dan Kanıtlar**

**Olamide Irete Olasehinde<sup>a</sup> & Olusesan Samuel Afolabi<sup>b</sup>**

**Öz**

Bu çalışma, Nijerya'da sürdürülebilir kapasite inşası için dış borç ve ekonomik büyüme arasındaki ilişkiyi 1980'den 2022'e uzanan yıllık zaman serisi verilerini kullanarak inceledi, Araştırma analizi için Otoregresif Dağıtılmış Gecikme (ARDL) Bound tekniği, ARDL eşbütünleşme formu ve Granger nedenselliği kullanıldı. Çalışmanın sonuçları, Nijerya ekonomisinde kullanılan değişkenler arasında uzun dönemli bir ilişki olduğuna dair kanıtlar olduğunu doğrulamıştır. Çalışma, yalnızca yabancı rezervlerin (FRES) ekonomik büyüme (GSYİH) üzerinde olumlu ve anlamlı uzun vadeli etkilere sahip olduğunu ortaya koymuştur. Sonuçlar, değişkenlerden hiçbirinin Nijerya ekonomisinin büyümesi üzerinde kısa vadede anlamlı bir etkiye sahip olmadığını göstermiştir. Granger nedenselliği analizi şunu ortaya koymaktadır.Dış borç ve faiz oranı ekonomik büyüme üzerinde Granger nedenselliği etkisi yapmakta iken ekonomik büyüme yalnızca ticarete açıklık üzerinde Granger nedenselliği etkisi yapmaktadır. Çalışmanın yapıldığı dönemde ticaretin dışa açıklığı ile ekonomik büyüme arasında çift yönlü bir nedensellik tespit edilmiştir. Araştırma bulgularına dayanarak, çalışma, ülkenin her düzeyde kapasitesite gelişimini teşvik etmek ve sürdürülebilir büyümeyi ve kalkınmayı artırmak için gereksiz borç servisini azaltmak iç ve dış ticareti artırmak amacıyla ticari açıklığı teşvik etmek için hükümetin verimsiz krediler ve tahviller almayı bırakmasını tavsiye ediyor.

*Anahtar Kelimeler* dış borç, ekonomik büyüme, Otoregresif Dağıtılmış Gecikme modeli, İkili Granger Nedensellik teknikleri.

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## Introduction

External debt is the borrowing made by countries across the globe especially the developing countries to boost domestic sources for expanding their economies. Obviously, the expansion of the economies of the countries across the World is insupportable especially in the developing nations without sourcing for funds in form of loans from external financial institutions like World Bank, International Monetary Fund etc., but some of these countries have woefully failed to utilize their external funds for the purpose for which it is obtained, whereby some are getting worse-off as a result of misappropriation and mismanagement of such borrowed funds. It is very good to develop one's economy which can only occur through borrowing, but the motive for borrowing at times is rudimentary which does not enhance the economy (Manasseh, Abada, Okiche, Okanya, Nwakoby, Offu, Ogbuagu, Okafor, Obidike and Nwonye, 2022).

The consequence of external liability on any economy in World especially among developing countries like Nigeria has caused great tension, drawing substantial attention from various sectors of the economy over the years. It is obvious that there is an existence of economic problem which resulted from accumulated external debt stock, particularly in less-developed countries and is a slavery palaver to the developing economies. Apart from misappropriation and mismanagement of funds, some of the borrowed funds are diverted into unprofitable projects, yielding no returns at all but is creating a burden on the internally generated revenues in the debtors' countries. Also, some of the leaders in developing countries borrow for the purpose of siphoning it (Gunter, 2002, Easterly, 2003; Adamu & Rasiah, 2016).

Nigeria external debt has a background, which was outlined to her independence in 1960 and up to 1970s, there was no serious credit problem facing her. It was noticed somehow that her ideology then did not encourage excessive borrowing from international capital market. In the 60s and 70s in Nigeria which could be viewed as a primitive era, she hardly had much projects to develop and as a results, no much fund was needed for development. But when borrowing was permitted to finance several developments in the country, it was not easy to obtain loans from the international capital market. The pre-independence period in Nigeria did not witness any significant growth and so foreign investors were not given any opportunity that could attract them into having investment here. The first major borrowing made by Nigeria as a result of oil glut was \$1 billion in late 1970s. Without any doubt, the critical and undeniable factor affecting economic growth globally is the excessive external debt taken especially for unproductive projects not meant for sustainable capacity development. But if the excessive external debt is being adequately utilized for productive projects which can yield much returns through economic expansion, there will not be a cause of regret for obtaining such a huge amount of loan by the time refund is being made (Rafael & Andrei, 2004).

The report from Debt Management Office (DMO) concerning Nigerian debts indicated that her debt stock as at 2017 was ₦21.68 trillion, lingering to \$76 billion (₦22.50 trillion) as at the end of 2021. From the collected information, the effect of DMO could be felt on Nigeria's loan stock through monitoring of monetary policy. The report from DMO shows that Nigeria is heavily dependent on external loans for one development or another and this has resulted in the increase in her loan structure from year to year, leading to her huge external debt (Oniha, 2018).

Former Deputy Governor of CBN (2017) described that Nigerian rising debt burden is worrisome and stressing because there is nothing much to show in terms of development for

obtaining such loans. Truly, this view is right as the rate at the Nigeria has been taking loans especially during Buhari's administration was worrisome as loan was taken concurrently for irrelevant project even until the regime was about to end. During his regime, Nigeria external debt has increased to ₦31 trillion, leaving ₦39.12 trillion debt for his successor. However, two-third of Nigerian accrued revenue is being used for servicing her debts, leaving just little fund to maintain the economy, and this has been having adverse effect on capacity building in terms of economic and social infrastructure (health and education). As a result of increasing our external loan in this country without much progress to show for it, it has given the World room to identify us as a poor country. Over the years, Nigeria debt has caused a lot of social and economic challenges and the revenue for debt servicing has made the government to be incapacitated in her responsibilities towards the citizens. Today, every citizen in Nigeria is trying hard to feed for himself or herself because our government has failed to perform her responsibility to supply the citizens with dividends of democracy which include free education, free health care provision, supply of good road network, housing but instead it is noticed for democratic failures, lack of rule of law, divide and rule policy etc. (FSDH research, 2017; DMO; Gabriel & Oghator, 2022).

The need for this research has generated some researchable questions such as; What relationship does external debt have with Nigerian economy? Is there granger causality between external debt and Nigerian economy? The paper is to provide solutions to the identified questions by analyzing the description view of the country within the period of study.

### **Statement of Problem**

Increasing Nigerian debt stock has in turn affected important economic and social infrastructures and economic growth, causing poor sustainable capacity building of the nation. In the area of infrastructure which should have been a means of easing the hardship of the citizens, there is nothing to write home about it. For example, the citizens are only enjoying bad road network, poor communication network, inadequate health care, epileptic power supply, food insecurity, insecurity of life and property among others. However, rising debt burden in Nigeria is worrisome and stressing, and her over-reliance on foreign loans is somehow affecting her social and economic sustainability. So, our development in terms of economic and social life does not commensurate with the rate of our borrowing and that is the reason for underdevelopment we are facing at every sphere of the economy. The highest fraction generated revenue being used for servicing debts annually is a major concern of International Monetary Fund (FSDH, 2017).

The capacity building is a scenario for improving an individual's or organization's capability to produce with different approaches for building the nation based on the accumulated debts but in Nigeria, it is impossibility not achievable and sustainable (Damte, 2010).

### **Objective**

Leading objective is for the researchers to examine the relationship between external debt and Nigerian economy for sustainable capacity building between 1980 and 2021. The specific objectives are to; examine causality among the variables involved and verify the granger causality of the study.

## Literature Review

### Theoretical Literature

As long as Nigeria revenue did not increase as expected, the government resorted to foreign borrowing which has led to external debts burden and financial crises over the years till today. When prices of commodity fell latterly, expenditures were not abridged consequently and earlier borrowing was supplemented with new borrowing in order to maintain expenditure situations to huge debts. According to Were, borrowing is not condemned from being taken but loan is being accumulated when fresh loan is taken to service a previous one and as a result, the loan becomes a burden, turning some of the debtors' countries into slavery and losing some vital resources for the sake of swapping with their creditors. For example, Nigeria is facing the swapping because of her inability to fulfill her financial obligation to her creditors (Were, 2001).

The debt overhauling concept is grounded totally on reimbursement potential with a few opportunities. A number of returns from investing inside financial system remain efficaciously taxed with the aid of current creditors, (Claessen et al., 1996). A reduction inside the cutting-edge debt carrier needs to, consequently, lead to a growth in contemporary investment. From the debt overhauling theory, it is clearly understood that it will be good for a debtor's country to keep on redeeming their loan as agreed upon in order for her to continue enjoying more financial credit facilities as needed, meaning the more you settle your debt, the more you get more financial support from your creditors. The handiest manner out of money owed being recommended, is that, debit remedy is increasing, which is antidote to financial instability (Cohen, 1993). IMF (2016) emphasized that 23 nations of which 19 are Africa had benefited from debt provider alleviation amounting to \$34 billion in June 2001. From the IMF records, it shows obviously that African countries are financially incapacitated and this is the reason why they keep on looking for loans from International Financial Institutions to back up their meager internally generated revenues.

Solow (1956) believed that neoclassical model for financial boom may be accomplished by using an expansion in the quantity of investment. Primarily based on this model, a country will achieve financial boom if it will increase her savings and investment, implying that for less-developed countries to develop economically, they need to implement regulations that support more financial savings to be able to result in boom-funding and as a result increase savings. In line with the neoclassical growth theory, debt has a fantastic direct impact on monetary boom. According to Solow, financial expansion is a necessity and it is a function of an investment. Without funds, there is no way an investment can be conceded, and for this reason, that is why the under-developed countries especially the African countries are always seeking for loans internally and externally to support the expansion of their economies.

Adebite, Ayadi, & Ayadi (2008) emphasized that a country ought to borrow overseas if it is far anticipated that the returns on the borrowed budget could be greater than the cost. Consequently, we do anticipate a country to spend money on projects having expected returns better than price of foreign debt. From their view, borrowing abroad is highly supported provided such a loan if invested on productive projects would bring forth substantial returns for the expansion of the economy. So, it is normal to get foreign loan in as much it is anticipated that it would yield good returns, leading to poverty reduction through creation of productive employment opportunities for the citizens (Manila, 2005). However if not used judiciously, debt can quantify to impeding the long-time period boom prospect of the country.



Capacity building is a method by which individuals and agencies acquire, enhance and hold the skills, knowledge, equipment and different resources to do their jobs effectively for sustaining the economy. It is quite an investment in the effectiveness and future sustainability of a public. When capacity building is successful, it strengthens a nonprofit's ability to convey on its mission over time, thereby enhancing nonprofit's ability to have a positive impact on lives and communities at large. So, capacity building is needed to bring a public to the next level of operational, programmatic, financial or organizational development, to effectively and efficiently advance its operation into the future. Capacity building is needed at all levels to enhance sustainable development in the nation to promote it. (Damtew, 2010; Martha, 2011 and National Council of Nonprofits, 2023).

### **Empirical Literature**

Alda, Elok and Moh (2022) examined the effect of gross domestic product, exports, imports, exchange rates, inflation and external debt on Indonesia's foreign exchange reserves in 2017 to 2020, using Multi-linear regression analysis. The findings showed that GDP has a positive significant effect on Indonesia's foreign exchange reserves. Her exports have a positive significant effect on her foreign reserves. Her imports have a negative significant effect on the foreign exchange reserves. Her exchange rate has a negative and significant effect on her foreign exchange reserves. Foreign debt has a positive significant effect on Indonesia's gross domestic product.

Mesbah (2022) observed uneven impact of foreign financial increase on Egyptian economy, spanning between 1980 and 2019, using Nonlinear Autoregressive disbursed Lag bound method and VECM. The findings confirmed a statistically sizable poor boom on the economy, stemming from each prompted debt. So, each brief and long runs of the findings in Egypt is symmetric. Nonlinearity hypothesis was supported with a negative impact which exceeds of 96.7%.

Ogbodo, Okofor and Nwaobi (2022) examined the impact of public debt on economic growth of Nigeria between 1990 and 2020, using Ordinary Least Square method. The findings showed that external debt has a positive significant relationship with the real gross product growth rate. Internal debt has a positive significant relationship with real gross product growth rate and there was uni-causality between real gross product growth rate and external debt.

Ehikioye, Omarkhanlen, Osuma and Inua (2020) examined the relations between external debt and economic increase in 43 African international locations between the length of 2001 and 2018, using Johansen Cointegration technique and generalized method of second. The findings exhibited the existence of long-run relationship between debts and financial increase in the countries concerned. The short-run converged to equilibrium inside the long-run, borrowing has a deteriorating effect on African economy. As a result, the findings boosted the need for policymakers to make certain right application, resulting in sustained long-time period monetary overall performance.

Ekpe (2020) investigated the impact of external debt on economic growth in Nigeria, using ARDL Bounds and Granger causality test. The findings showed that external debt has a positive significant relationship with gross domestic product. Also it is revealed that exchange rate indicates a positive significant relationship with GDP. Then, the study exhibited a long-run relationship between external debt and economic growth in Nigeria. From Granger causality test, it was shown that external debt has no causal relationship with economic growth in Nigeria.

Fagbola, Sokunbi, Aderemi and Adebayo (2020) examined the contribution of external debts to economic growth in Nigeria from 1981 to 2018, using ARDL model and Bounds testing techniques. The findings showed that external debt caused a significant setback to economic growth in Nigeria during the periods of study. It was showed that debt servicing and economic growth had a direct relationship, while exchange rate contributed negatively to the economic growth in Nigeria.

Qureshi, Irfan and Liaqat (2020) examined the relationship between external debt and economic growth. The database of 123 nations sampled among 1990 and 2015 were employed, with the use of a Panel Vector Autoregression technique. The findings showed that total external debt had a negative effect on growth on sampled countries and recorded a good affiliation with earnings increase inside the decrease and top-center-income nations. Therefore, it was shown that external debt had positive association with income growth in the lower-and upper-middle income countries.

Obisesan, Akosile and Ogunsanwo (2019) examined the effect of external debt on economic growth in Nigeria from 1981 to 2017, using Ordinary Least Square econometric technique. The findings showed that external debt and external debt service payment have negative effect on the economy. Exchange rate has positive effect on economic growth. Based on Durbin Watson test, the model is positively autocorrelated.

Adamu and Rasiah (2016) investigated the dynamic effect of external debt on economic growth in Nigeria from 1970 – 2013 with the usage of ARDL bound. The findings showed a long-run cointegration relationship between the variables. In the long-run, external debt has a sustainability positive index of 0.072%.

In Nigeria, public debt was showed that ₦12.589 trillion was her debt in December 2017, ₦12.577 trillion in March 2018 and ₦12.151 trillion in June 2018, demonstrating a reduction in her debt’s stock which might have happened as a result of the policy implementation from DMO on debt service strategies (Oniha, 2018).

## Methodology

### Model Specification

The paper adopts a modified version of Adamu & Rasiah (2016) model for developing countries, covering a span of 42 years (1981 – 2022);

$$\text{GDP} = f(\text{EXTD}, \text{EDS}, \text{FRES}, \text{INTR}, \text{OPN}) \dots\dots\dots (1)$$

Where:

- GDP = Gross domestic product
- EXTD = External debt
- EDS = External debt servicing
- FRES = Foreign reserves
- INTR = Interest rate proxy by real interest rate
- OPN = Openness of trade

Equation 2 indicates the econometric form of equation 1 as thus:

$$\text{GDP}_t = \alpha_0 + \alpha_1\text{EXTD}_t + \alpha_2\text{EDS}_t + \alpha_3\text{FRES}_t + \alpha_4\text{INTR}_t + \alpha_5\text{OPN}_t + u_t \dots\dots\dots (2)$$

Where:

$\alpha_0$  = constant intercept  
 $\alpha_1$  to  $\alpha_5$  = estimated parameters.  
 $U_t$  = error term

## Data Analysis and Discussion

**Table 1**

*Descriptive Statistics*

	GDP	EXTD	EDS	FRES	INTR	OPN
Mean	25.65027	21.78756	21.25018	22.92516	1.875551	3.760143
Median	25.50757	21.23810	21.28289	22.77482	1.717211	3.878878
Maximum	27.06627	25.35906	22.89883	24.70481	3.298521	4.404399
Minimum	24.04658	19.62719	19.55938	20.65390	-0.083382	2.772589
Std. Dev.	0.970084	1.707653	0.679375	1.392905	0.799357	0.436547
Skewness	0.079316	0.596754	-0.134386	-0.169320	-0.042159	-0.482031
Kurtosis	1.426413	2.310577	3.540711	1.460730	2.823284	2.030993
Jarque-Bera	4.377346	3.324589	0.638062	4.243551	0.067092	3.269682
Probability	0.112065	0.189703	0.726853	0.119819	0.967011	0.194983
Sum	1077.311	915.0776	892.5074	939.9316	78.77314	157.9260
Sum Sq. Dev.	38.58359	119.5592	18.92356	77.60738	26.19781	7.813495
Observations	42	42	42	41	42	42

Source: Researchers' Computation

From the Descriptive table, the mean ranged from interest rate (1.875551) to gross domestic product (25.65027). The standard deviation consists of positive low variability. The variables are positively and negatively skewed which ranged from -0.482031 (OPN) to 0.596754 (EXTD). From the estimated values of the kurtosis, gross domestic product (GDP), external debt (EXTD), foreign reserves (FRES), and openness of trade (OPN) are platokurtic, having lower values than the sample mean of 3, while only external debt servicing (EDS) is having the normal kurtosis mean value of 3. The Jarque-Bera statistics p-values indicated that debt servicing (EDS) and interest rate (INTR) exhibited normal distribution as the p-values are greater 5%, showing the normality of the variables while economic growth (GDP), external debt (EXTD), foreign reserves (FRES) and trade openness (OPN) were not normally distributed as they have less than 5% p-values.



**Table 2***ADF Unit Root Test with Intercept, using Akaila criterion*

Variables	AT LEVEL		1 <sup>ST</sup> DIFFERENCE		Order of Stationary
	F-stat	5% Critical value	F-stat	5% Critical value	
<b>GDP</b>	-0.319311	-2.936942	-4.518060	-2.936942	<b>I(1)</b>
<b>EXTD</b>	-0.206560	-2.935001	-5.668536	-2.936942	<b>I(1)</b>
<b>EDS</b>	-4.439336	-2.935001			<b>I(0)</b>
<b>FRES</b>	-0.729173	-2.938987	-5.509155	-2.948404	<b>I(1)</b>
<b>INTR</b>	-3.291824	-2.935001			<b>I(0)</b>
<b>OPN</b>	-1.788346	-2.935001	-8.233366	-2.936942	<b>I(1)</b>

Source. Researchers' Computation

Augmented Dickey-Fuller Unit root test with an intercept was employed for stationarity of the variables. Based on the results, external debt servicing (EDS) and interest rate (INTR) were stationary I(0) in nature, while economic growth (GDP), external debt (EXTD), foreign reserves (FRES) and openness of trade (OPN) are non-stationary, that is, they were stationary at 1<sup>st</sup> difference [I(1)]. Based on the condition of time-invariant variables, Autoregressive Distributed Lag (ARDL) technique would be employed on the data employed.

**Table 3***Lag selection criteria*

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-186.1646	NA	0.002367	10.98083	11.24746	11.07287
1	-62.49870	197.8654*	1.63e-05*	5.971354	7.837772*	6.615642*
2	-31.52505	38.93830	2.63e-05	6.258574	9.724779	7.455108
3	13.52167	41.18557	2.75e-05	5.741619*	10.80761	7.490398

Source. Researchers' Computation

The Table showed that Sequential modified LR test statistic (LR), Final prediction error (FPF), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ) have in common lag 1, while only Akaike information criterion (AIC) has in common lag 3. From the information, the lag with the highest variables would be suitable for the study. As a result, lag 1 would be employed in this study.

**Table 4***Pesaran ARDL Bound Cointegration Test*

H0: There is no long-run relationship among the variables.

H1: There is long-run relationship among the variables.

<b>T-statistics</b>	<b>Value</b>	<b>K</b>
F-statistics	4.113244	5
<b>Critical Value Bounds</b>		
<b>Level of significance</b>	<b>I(0) Bound</b>	<b>I(1) Bound</b>
10%	2.08	3.00
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Source. Researchers' Computation

The Table revealed that the computed ARDL f-statistic value of 4.113244, while the estimated upper Bound values are 3.00, 3.38, 3.73 and 4.15 which were corresponding to the level of significance of 10%, 5%, 2.5% and 1% respectively. From the analysis, the f-statistic value is greater than the upper bound values from 10%, 5% and 2.5%, making the variables to be cointegrated. As a result,  $H_0$  is rejected and accept  $H_1$ , indicating there is long-run relationship among the variables employed between 1981 and 2022.

**Table 5.***ARDL Cointegration short-run form*

<b>Variables</b>	<b>ARDL Cointegration Short-run</b>			
	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-statistic</b>	<b>P-value</b>
D(EXTD)	-0.037598	0.056269	-0.668176	0.5097
D(EDS)	0.004811	0.049670	0.096856	0.9236
D(FRES)	0.108109	0.075036	1.440768	0.1611
D(INTR)	-0.010591	0.040937	-0.258729	0.7978
D(OPN)	-0.075750	0.142953	-0.529895	0.6005
CointEq(-1)	-0.256382	0.043219	-5.932208	0.0000

Source. Researchers' Computation

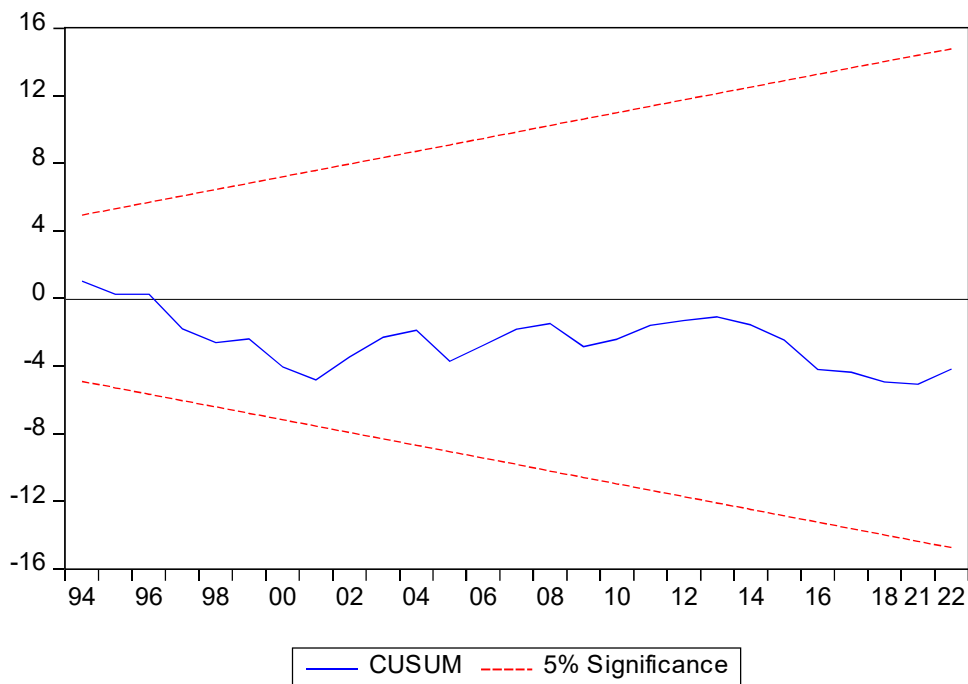
The ARDL cointegration short-run model showed that external debt (EXTD), interest rate (INTR) and trade openness (OPN) have negative insignificant short-run impacts on GDP, while external debt (EXTD) and foreign reserves (FRES) have positive insignificant short-run impacts on economic growth (GDP) in Nigeria. The ECM met the required condition in which the coefficient is -0.256382 and the p-value is 0.0000, showing a long-run causality (cointegration) where the error can be adjusted at the speed of 25.64%.

**Table 6***ARDL Cointegration Long-run form*

Variables	ARDL Cointegration Long-run			
	Coefficient	Standard Error	t-statistic	P-value
GDP				
EXTD	0.052069	0.152000	0.342558	0.7346
EDS	-0.130558	0.265825	-0.491143	0.6273
FRES	0.695036	0.162085	4.288096	0.0002
INTR	0.112244	0.236519	0.474567	0.6389
OPN	-0.253464	0.434775	-0.582977	0.5647

Source. Researchers' Computation

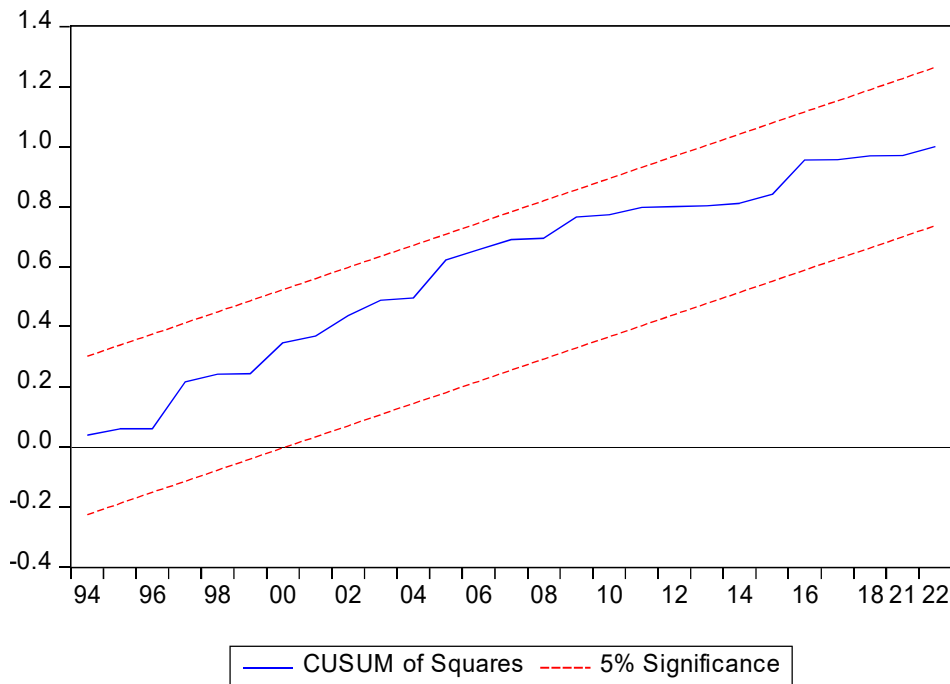
Table 6 showed the ARDL Cointegration long-run model. From the results, only foreign reserves (FRES) has positive significant long-run impact on the economic growth. External debt servicing (EDS) and openness of trade (OPN) have negative insignificant impact on Nigerian economic growth, while external debt (EXTD) and interest (INTR) have positive insignificant impacts on the economic growth (GDP).

**Figure 1***Stability test, using CUSUM TEST*

The cumulative sum (CUSUM) investigated the stability of both short-run and long-run parameters in the study. Based on this, the CUSUM showed that the cumulative sum of the variables lies within the critical bounds at the 5% level and as a result, we can affirm the stability of short-run and long-run parameters in the study.

**Figure 2**

*CUSUM SQUARE TEST*



The cumulative sum of square (CUSUM-q) is also used to determine the stability of both short-run and long-run parameters in the study. Based on this, the CUSUM-q showed that the cumulative sum of square of the variables lies above zero origin and within the critical bounds' level. As a result, we can uphold the stability of short-run and long-run parameters in the study.

**Table 7**

*AR Root Table*

Root	Modulus
1.244182	1.244182
0.917107 - 0.087306i	0.921253
0.917107 + 0.087306i	0.921253
0.646102 - 0.523212i	0.831384
0.646102 + 0.523212i	0.831384
0.012075 - 0.548621i	0.548754
0.012075 + 0.548621i	0.548754
0.242207 - 0.418755i	0.483756
0.242207 + 0.418755i	0.483756
-0.341958 - 0.195106i	0.393702
-0.341958 + 0.195106i	0.393702
-0.320624	0.320624

Source. Researchers' Computation

Table 7 showed the roots of AR of the model which ranged from 1.244182 to -0.320624, having modulus from 1.244182 to 0.320624.

**Table 8**  
*Pairwise Granger Causality Test*

Pairwise Granger Causality				
Sample: 1981 – 2022				
Lags: 1				
Null Hypothesis	Obs.	F-stat	Probability	Comment
EXTD does not Granger Cause GDP	41	10.2215	0.0028	Unidirectional causality
GDP does not Granger Cause EXTD		0.72872	0.3986	
EDS does not Granger Cause GDP	41	0.87742	0.3548	No causality
GDP does not Granger Cause EDS		3.64270	0.0639	
FRES does not Granger Cause GDP	39	29.3784	4.E-06	Unidirectional causality
GDP does not Granger Cause FRES		0.17979	0.6741	
INTR does not Granger Cause GDP	41	6.75978	0.0132	Unidirectional causality
GDP does not Granger Cause INTR		0.22678	0.6367	
OPN does not Granger Cause GDP	41	6.76712	0.0132	Bidirectional causality
GDP does not Granger Cause OPN		5.99475	0.0191	
EDS does not Granger Cause EXTD	41	1.81055	0.1864	No causality
EXTD does not Granger Cause EDS		1.55769	0.2196	
FRES does not Granger Cause EXTD	39	0.40089	0.5306	Unidirectional causality
EXTD does not Granger Cause FRES		5.98663	0.0194	
INTR does not Granger Cause EXTD	41	0.42539	0.5182	No causality
EXTD does not Granger Cause INTR		0.20933	0.6499	
OPN does not Granger Cause EXTD	41	0.19973	0.6575	No causality
EXTD does not Granger Cause OPN		1.49781	0.2285	
FRES does not Granger Cause EDS	39	4.57425	0.0393	Unidirectional causality
EDS does not Granger Cause FRES		0.02729	0.8697	
INTR does not Granger Cause EDS	41	0.88977	0.3515	No causality
EDS does not Granger Cause INTR		0.01788	0.8943	
OPN does not Granger Cause EDS	41	0.01955	0.8895	No causality
EDS does not Granger Cause OPN		0.44952	0.5066	
INTR does not Granger Cause FRES	39	0.62322	0.4350	No causality
FRES does not Granger Cause INTR		0.04009	0.8424	
OPN does not Granger Cause FRES	39	0.01184	0.9140	No causality
FRES does not Granger Cause OPN		0.62029	0.4361	
OPN does not Granger Cause INTR	41	7.84626	0.0080	Unidirectional Causality
INTR does not Granger Cause OPN		0.00206	0.9640	

Source.Researchers' Computation

The results from Table 7 showed that there is unidirectional causality between external debt (EXTD) and economic growth (GDP), between interest rate (INTR) and economic growth (GDP), between external debt (EXTD) and foreign reserves (FRES), between foreign reserves (FRES) and debt servicing (EDS) and between openness of trade (OPN) and interest rate (INTR). Only bidirectional causality that occurred was established between openness of trade (OPN) and economic growth (GDP), while some variables have no causality at all. In summary, it is only external debt and interest rate that granger caused economic growth in Nigeria within the period of study (1981-2022).

## **Conclusion and Recommendations**

The study showed that there was evidence of long-run relationship among the variables employed in Nigerian economy. It was discovered that foreign reserves (FRES) has positive and significant long-run impacts on (GDP) as aligned with Alda et al (2022), while the remaining variables have insignificant long-run impacts on the economic growth. It was alarming that none of the variables has short-run significant impacts on the economic growth. The Granger causality revealed that it was only external debt (EXTD) and interest rate (INTR) that granger caused (GDP) between 1981 and 2022. Then, the stability test of the model was confirmed to be asserted through CUSUM and CUSUM-q tests.

The policy recommendation from the findings is that the policy makers, economic planners and committee of advisers on financial matters should stand as watchdogs on government, encouraging her to reduce the trends of external debt, external debt service, and interest rate which are part of the determinants of economic growth in Nigeria. Moreover, government should be discouraged from taking loans for unproductive projects in order to reduce debt servicing, and to encourage government to utilize loans taken in all sectors for sustainable capacity building of the entire economy and to encourage trade openness to boost internal and external trade for the sustainability of the economy.



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