



EFFECT OF INTERGENERATIONAL DEBT BURDEN ON ECONOMIC GROWTH IN NIGERIA

Ben Etim Udoh¹⁺

Kelvin-Iloafu

Lovlyn Ekeowa²

Ilo Sylvester
Okechukwu³

Obiora-
Okafochinedu
Afamefuna⁴

Nwonye Ada-John
Cordelia⁵

^{1,2,3,4} University of Nigeria, Enugu Campus, Nigeria.

¹Email: etim.ben@unn.edu.ng Tel: 08038358331

²Email: Lovlyn.kelvin-Iloafu@unn.edu.ng Tel: 08033134207

³Email: Sylvester.ilo@unn.edu.ng Tel: 08034722626

⁴Email: chineduobioraokafu@gmail.com Tel: 08063595400

⁵Institute of Management Technology, Enugu, Nigeria.

⁴Email: cordeliannwonye7@gmail.com Tel: 08033112734



(+ Corresponding author)

ABSTRACT

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An equitable proportion of government borrowing from internal and external creditors exerts a positive and significant impact on the economy. When the funds borrowed are used for unproductive investment without sufficient marginal returns to service the debts, debt becomes burdensome reducing all the indicators of economic growth. This study uses quarterly data from 2006 to 2018 to investigate the effect of intergenerational debt burden on economic growth in Nigeria, testing the hypothesis with the ARDL model to estimate the long and short-term cause-effect relationship. The findings reveal that borrowed funds are habitually used in Nigeria to pay salaries and allowances, resulting in debt overhang and intergenerational debt burden. The impact of debts to other creditors is significant on economic growth and human capital development, but negative by multilateral and bilateral creditors. The negative effect is probably because of the poor management and investment of the funds borrowed into unproductive ventures. The results show long-term cointegration, while the speed with which the disequilibrium, caused by the mismanagement of borrowed funds in earlier years, returns to long-term equilibrium is 26% in the current year, according to the error correction coefficient. Thus, Barro's provocative Hypothesis is valid in the long term and Lerner's view in the short term for Nigeria.

Contribution/Originality: This study contributes to the existing literature by in three ways: (i) adopting quarterly data on money supply (M3), multilateral creditors/debt, bilateral creditors/debt, other creditors/debt, and government expenditure on social and community services as moderating variables; (ii) using first-order analysis by conducting a range of pretests to determine the appropriate estimation model and estimation diagnostic analyses to ensure the Gauss–Markov assumptions for unbiased estimation are satisfied, forming the basis for a reliable analysis; and (iii) adopting the ARDL model to examine the long- and short-term effects of the intergenerational debt burden on economic growth in Nigeria, as well as Barro's provocative hypothesis and Lerner's view.

1. INTRODUCTION

The ultimate motivation of any government is to ensure sustainable growth and development through cost reduction and credit availability, increase in income per capita, productivity level and price stability with the target of 2% inflation; however, the fragile economic, business, and financial systems in Nigeria impede sustainable growth and development. The need to close the savings–investment gap and counterbalance fiscal and monetary policies has led the government toward external sources of finance, such as multilateral and bilateral creditors, instead of taxation and other internal sources of revenue (Ajayi and Oke, 2012). Such borrowing is to stimulate economic growth and development, though, creates debt.

Ewubare *et al.* (2017) observed that public debt arises from a domestic savings–investment gap alongside an expansionary fiscal policy for providing basic social amenities. According to debt growth theory, an equitable degree of external or internal borrowing can stimulate economic growth at a rate of 5%–7%, or more, increasing infrastructural development, life expectancy, and determinants of economic growth and development while simultaneously reducing rates of poverty and infant and maternal mortality rate, among others (Tajudeen, 2012).

Onakoya and Ogunade (2017) recommended that countries and organizations with a savings–investment gap should only borrow funds if their investment could generate higher marginal returns, which would service both the principal and interest of the original loan. Where the marginal return is less than the interest rate, the debt becomes a burden and carries over to future generations. Specifically, Monogbe *et al.* (2015) observed that public debt also becomes a burden when funds are used to finance the current payment of salaries and allowances without the marginal returns required to service the principal. Prolonged borrowing without repayments prevents investment and reduces income per capita and productivity levels while increasing poverty and unemployment rates, as well as borrowing cost due to interest rates.

Studies of Izedonmi and Ilaboya, (2012); Kadiu (2015); Ewubare *et al.* (2017) and Onakoya and Ogunade (2017) also argued that external debt significantly affects economic growth where funds are used for productive investment and properly managed to generate higher marginal returns that services the borrowing costs. In contrast, Ezenwa, (2012); Faraji and Makame, (2013); Ijeoma, (2013); Saheed, (2015); Abdur and Amara, (2017); Silveria and Okiro, (2018) opined debt carries a colossal risk, particularly for highly indebted countries such as Nigeria, that outweighs the benefits.

Nigeria's external debt profile remained minimal until the global oil crisis of the late 1970s, the quest to meet its financial obligations and safeguard sustainable growth and development, the government was forced to take out a “jumbo” loan of \$1 billion from the International Capital Market in 1978 (Erhieyovwe and Onovwoakpoma, 2013). From 1986, Nigeria's debt profile then increased sporadically, due to the continuous borrowing from other countries and international financial organizations at non-concessional interest rates.

According to Bakare (2010), Bolanle *et al.* (2015), and Kadiu (2015), the Paris Club cancelled \$18 billion of debt and accepted a payment of \$12 billion to offset the remaining debt, which also cleared the grants from the London Club outright. This ameliorated the negative impact of debt burden in Nigeria.

Nigeria's external debt profile increased from ₦438.59 billion in 2007 to ₦523.25 billion in 2008, and then still further to ₦1,026.90 billion in 2012, ₦2,111.51 billion in 2015, ₦5,787.51 billion in 2017, and ₦7,759.20 billion in 2018 (Central Bank of Nigeria, 2018). During the same period, there were also geometric increases in the poverty rate—by 61.5% among citizens in extreme poverty, living below \$2 per day (\$2), and by 23.8% among those in moderate poverty, living below \$3 per day—infant and maternal mortality rate, outbreaks of deadly viruses, and insecurity, among others.

The negative impact of external debt on the economy instigated a debate about on whether debt burden is intergenerational, and this study examines the arguments through Barro's provocative hypothesis and Lerner's view. According to Barro's provocative hypothesis, if government expenditure is used for unproductive investments, then the debt burden becomes intergenerational affecting human capital development. According to

Lerner's view, if government expenditure is used for productive investment, with higher marginal returns to service the principal, economic growth and development is stimulated debts is not carry over to future generations.

The controversy between Barro and Lerner is the focal point of this study, unlike previous studies that analyzed the impact of external debt and debt servicing on economic growth. Instead, this study focuses on the effect of the intergenerational debt burden on Nigeria's economic growth, examining the economic conditions following the clearance of the London Club's grants and cancellation of the Paris Club's debt in 2005.

2. LITERATURE REVIEW

2.1. Conceptual and Contextual Framework

The domestic savings–investment gap plays a crucial role in sustainable economic growth and development. In both industrialized and emerging economies, it hinders growth and development indicators, which stimulates the need for internal or external borrowing to bridge the gap and creates public debt. The inability of indebted nations and organizations to promptly service their credit facilities converts their debt into an intergenerational debt burden.

Nigeria constantly faces the threat of an intergenerational burden, since the funds borrowed are used for current expenditure on wars, insurgency, the payment of allowances and salaries, among others, without sufficient marginal returns to service the principal. In 2014, Nigeria exceeded its external borrowing limit, due to un-service debt from earlier years. This intergenerational debt burden led to a decline in economic activities, productivity, and performance, as well as the opportunity for future generations to access external credit facilities to stimulate economic growth and development.

2.2. Theoretical Framework

a. Debt Overhang Theory

According to the debt overhang theory, unserviced debts are burdensome on the current and future generations, which in turn reduces economic growth and human capital development. Due to the negative effect of unserviced external debt on the economy, governments seek more sources of internal finance to close the saving–investment gap; however, the high interest rates and competition between government and the private sector for credit facilities hindered private investment.

b. Barro's Provocative Hypothesis

According to Barro's provocative hypothesis, the investment of the funds borrowed into unproductive ventures, in which the marginal returns are insufficient to service the loans, lead to not only a current but also intergenerational debt a burden. Hence, government fiscal policy becomes irrelevant.

c. Lerner's View

According to Lerner's view, the investment of the funds borrowed into productive schemes, such as social and community services, basic infrastructure, security, that generate higher marginal returns with which to service the loans, prevents debts carrying over to future generations. Thus, the existence of an intergenerational debt burden depends exclusively on the expected marginal returns to service the principal: higher marginal returns service the principal and stimulates economic and human capital development. Unlike Barro, therefore, government fiscal policy becomes relevant.

d. Liquidity Constraint Theory

The liquidity constraint hypothesis posits that pressure from developed economies for the repayment of prolonged debt discourages emerging economies from external borrowing. The potential for failing to service and

repay debts and avoid an intergenerational debt burden thus increases governments' demands for internal credit facilities to provide basic social amenities.

e. Classical Economic Theory

Classical economic theory (among the main proponents of which were Adam Smith, David Ricardo, and John Stuart Mill) argues that the significant correlation between increased external debt and unproductive government expenditure impedes private savings and reduces investible resources. The Harrod–Domar economic growth model, though, posits that the savings–investment (or capital output) ratio is vital in motivating economic growth.

2.3 Empirical Review

Table 1 Empirical Review

Author	Topic	Country	Period	Data Frequency	Methodology	Results/Findings
Al-Zeaud (2014)	Impact of public debt on Jordan's economic performance	Jordan	1991 and 2010	Annual	OLS	Public debt has a positive, and debt servicing a negative, impact on economic growth in Jordan.
Rashid and Muhammad (2014)	Effect of external debt on Pakistani economy	Pakistan	1972 and 2010	Annual	OLS	A positive relationship exists between external debt and economic growth in Pakistan.
Wellington (2015)	The growth debt nexus in Zimbabwe	Zimbabwe	1930 and 2013	Annual	OLS	Public debt has a negative impact on economic growth in Zimbabwe.
Hadhek and Mrad (2014)	Effect of debt on economic growth in 19 countries	19 developing countries: Tunisia, Egypt, Mali, Niger, Congo Democratic Republic, Ethiopia, Angola, Gambia, Bangladesh, Jordan, Mauritania, Algeria, Malawi, Guinea, Ghana, India, Sri Lanka, Cote d'Ivoire, and El Salvador	1990 and 2011	Annual	Arellano and Bond dynamic panel technique. data estimator	External debt has a negative impact on economic growth in these countries.
Suna (2015)	The external debt and economic growth nexus in Turkey	Turkey	2003 and 2014	Annual	Vector AutoRegression (VAR) and Granger Causality	There is a unidirectional causality from external debt to economic growth in Turkey.

Ezenwa (2012)	Effect of foreign loans on economic growth in Nigeria	Nigeria	1970 and 2010	Annual	OLS and Granger Causality	External debt inhibits economic growth due to the increase in debt servicing costs above the sustainable debt limit. No nexus exists between external debt and economic growth.
Bolanle <i>et al.</i> (2015)	Impact of cointegrated debt and foreign direct investment	Nigeria	1990 and 2013	Annual	Johansen Cointegration Test	External debt has a negative impact on economic growth in the short term, while foreign direct investment has a negative impact in the long term.
Ibi and Aganyi (2015)	Effect of external debt on economic growth	Nigeria		Annual	Vector Autoregression (VAR) and Granger Causality	A non-significant correlation exists between external debt and economic growth.
Nwaeze <i>et al.</i> (2015)	External debt and economic growth	Nigeria	2003 and 2013	Annual	OLS	Debt servicing significantly impacts on economic growth.
Monogbe (2016)	Intergenerational effect of the foreign loans on the economy	Nigeria	1981 and 2014	Annual	OLS	External debt significantly impacts on economic growth
Iliya and Tahir (2017)	Impact of external debt on economic growth in Nigeria	Nigeria	1980 and 2014	Annual	Vector Autoregression (VAR), Johansen Cointegration Test, and Vector Error Correction Model (VECM) Approach	Debt servicing negatively and significantly impacts on real GDP in the long term.
Ewubare <i>et al.</i> (2017)	Effect of public borrowing on the Nigerian economy	Nigeria	1980 and 2015	Annual	Autoregressive Distributed Lag (ARDL) Model	External debt significantly stimulates while internal debt significantly inhibits economic growth in both the short and long term.

3. METHODOLOGY

This study adopts the neoclassical production function model to examine the effect of the intergenerational debt burden on economic growth in Nigeria, which was also used by [Abdur and Amara \(2017\)](#) to determine the impact of external debt on economic growth in Pakistan. Failing to service and repay a debt by the current generation reduces productivity, capital, and labor in future generations. It is thus relevant to include external debt in the production function:

$$Y = f(K, L, FD)$$

Where,

Y = output, K = capital, L = labor, and FD = Foreign Debt

In contrast, the model used by [Cunningham \(1993\)](#) included internal as well as external debts to examine the effects of debt on economic growth. This study separates external debt into multilateral, bilateral, and other creditors to explore the individual effect on the economy, and on future generations if the current one failed to service and repay those debts.

3.1. Model Specification

The specific econometric model in this study is the classical linear regression model, which can be expressed as:

$$Y_t = \beta_0 + \beta_1SOCS_t + \beta_2MULT_t + \beta_3BILAT_t + \beta_4OTHE_t + \beta_5MSPP_t + \mu_t \dots \dots \dots (1)$$

Where,

SOCS = Social and Community Services, MULT = Multilateral creditors/debt,
 BILAT = Bilateral creditor/ debt, OTHE = Other Creditor/debt, MSPP = M3 Money Supply

3.2. Nature and Source of Data

This study extracted quarterly time series data from the Central Bank of Nigeria’s statistical bulletin, covering the period from 2006, following the debt cancellation, to 2018. This secondary source data was then analyzed to investigate the impact of external debt on Nigeria’s economic growth and its intergenerational effect if the debts were not serviced on time.

3.3. Study Variables

1. Gross national product (GDP) at current market prices (i.e., the price purchasers pay for goods and services) measures economic growth.
2. Social and community measures of government capital expenditure on human capital development.
3. Multilateral, bilateral, and other credit/debit measures of government external debt burden when not serviced and repayed by the current generation.
4. M₃ money supply measures (i.e., M₂, M₁, M₀, and liquid components of the money supply not in circulation, such as repurchase agreements), which is the broadest measure of money supply in an economy.

4. DATA ANALYSIS

4.1. Pre-test

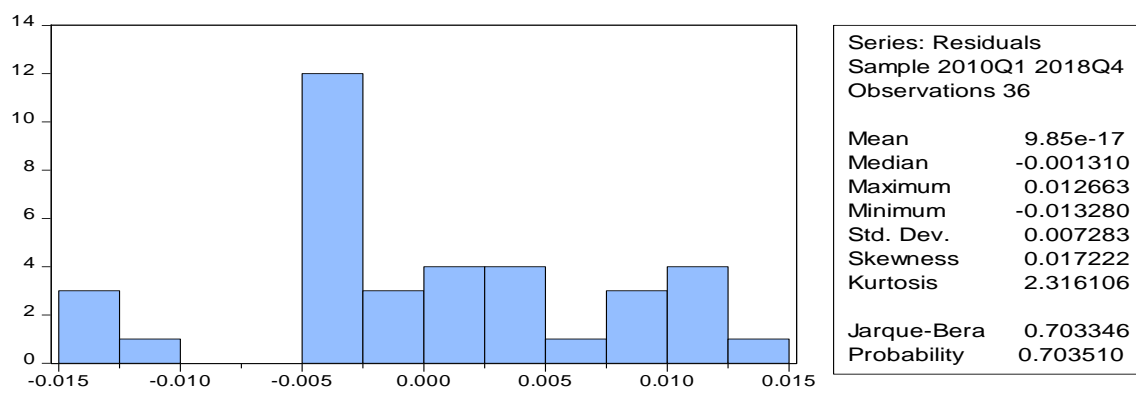


Figure-1. Descriptive statistics of the study variables.

Figure 1 outlines the aggregated averages of the observations: the mean, median, and standard deviation, representing the spread and variation of the data. In addition, skewness (i.e., the degree of asymmetry) and kurtosis

(i.e peakednes) both measure the extent to which the distribution varies from the normal distribution by examining the extreme values in the tails of the bell curve. In this case, the results are largely platykurtic (kurtosis < 3), meaning extreme events are less likely. The Jarque–Bera (J–B) and probability (p-) values >5%.

4.2. Unit Root

The stationarity of the variables were investigated according to Gauss–Markov assumptions for unbiased estimation using the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests. The null hypothesis for both tests was that the series had a unit root and can be expressed as:

$$\Delta y_{t-1} = \alpha_0 + \lambda y_{t-1} + \alpha_2 t + \sum_{i=2}^p \beta_j \Delta y_{t-1} + \mu_t$$

Where, y = dependent variable, t = trend, a = intercept, μ_t = white noise

The results (Table 2) show the variables had stationarity at I(1) and I(0) orders of integration. A combination of these orders provides theoretical support for adopting the autoregressive distributed lag (ARDL) model proposed by Pesaran *et al.* (2001) to test for long- and short-term cointegrating relationships among the variables.

Table-2. Summary of ADF and PP unit root tests.

Variable	Test	Statistics	5% Critical Value	Order of Integreation	Inference
GDP	ADF	-7.389	-3.456	I(0)	Stationary
	PP	-8.402	-3.590	I(0)	
SOCS	ADF	-5.781	-2.701	I(1)	Stationary
	PP	-6.791	-4.467	I(1)	
MSPP	ADF	-6.915	-3.143	I(0)	Stationary
	PP	7.902	-4.600	I(0)	
MULT	ADF	-5.201	-1.010	I(1)	Stationary
	PP	7.092	-5.210	I(1)	
BILAT	ADF	-6.752	-2.610	I(0)	Stationary
	PP	-6.891	-1.710	I(0)	
OTHE	ADF	-5.705	-2.350	I(0)	Stationary
	PP	-6.670	-3.109	I(0)	

Note: Values in parentheses are p-values at the 5% significance level.

4.2.1. Decision Rule

The p-values of all the variables were < 0.05, which rejected the null hypothesis of unit rootwas convincingly rejected. The tests satisfy the Gauss–Markov assumptions for unbiased estimation, forming the basis of a reliable analysis.

4.3. Stability Test

Figures 2 and 3 show the stability test results of the cumulative sum (CUSUM) of recursive residuals and cumulative sum of squares (CUSUMSQ). As the blue lines fall within the upper and lower control limits without crossing these critical boundaries, the variables and data are stable. These results verify the Gauss–Markov assumptions.

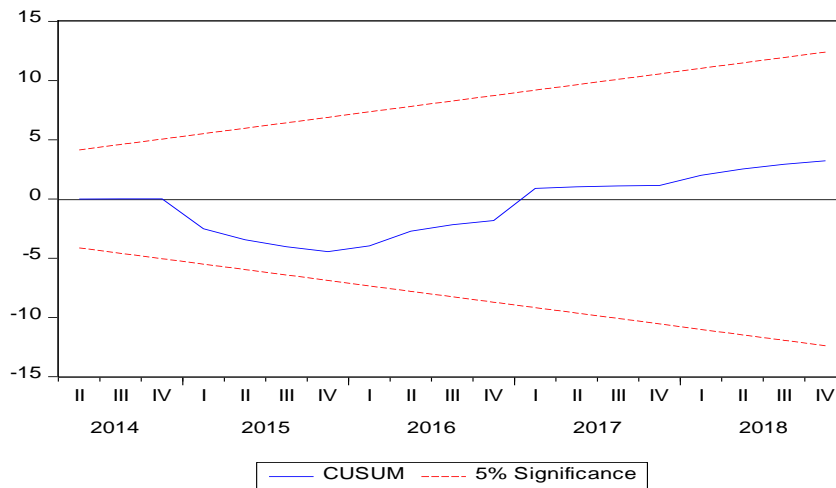


Figure-2. The cumulative sum of recursive residuals (CUSUM).

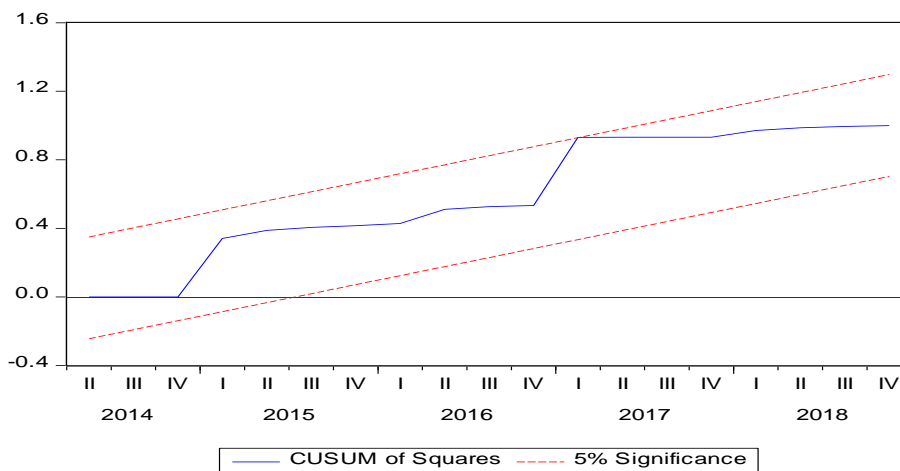


Figure-3. The cumulative sum of squared recursive residuals.

4.4. Estimation of the ARDL Regression Model

$$\Delta \text{LogGDP}_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta \text{LogGDP}_{t-1} + \sum_{i=0}^n \alpha_{2i} \Delta \text{LogSOCS}_{t-1} + \sum_{i=0}^n \alpha_{3i} \Delta \text{LogMULT}_{t-1} + \sum_{i=0}^n \alpha_{4i} \Delta \text{BILAT}_{t-1} + \sum_{i=0}^n \alpha_{5i} \Delta \text{OTHE}_{t-1} + \sum_{i=0}^n \alpha_{6i} \Delta \text{MSPP}_{t-1} + \beta_1 \text{LogGDP}_{t-1} + \beta_2 \text{LogSOCS}_{t-1} + \beta_3 \text{LogMSPP}_{t-1} + \beta_4 \text{logMULT}_{t-1} + \beta_5 \text{logBILAT}_{t-1} + \beta_6 \text{logOTHE}_{t-1} + U_t \dots \dots \dots (2)$$

Where,

Δ = first difference operator and the parameters $\alpha_1 - \alpha_6$ = short-term and $\beta_1 - \beta_6$ = long-term relationship dynamics of the model.

Prior to analyzing the ARDL results, it's obligatory, to discuss the other parameters estimation and diagnostic tests shown in Table 3. These were calculated to confirm that none of the assumptions in the model were violated, such violations could cast doubt on the validity and reliability of the model.

The 99% coefficient of determination (R^2) confirmed the goodness of fit and reliability of the model, as well as the independent variables accounting for the variation in the dependent variable. Despite a 1% unexplained variation, the F-statistic of 3809.666 and p-value of 0.000 implied that the entire model was positive, statistically significant, and reliable, for the analysis to be meaningful.

Table-3. ARDL regression results.

Variable	Coefficient	Std. Error	t-Statistic	Probability*
LOGGDP(-1)	0.013279	0.031854	0.416875	0.6802
LOGGDP(-2)	1.32E-12	0.031961	4.4E-11	1.0000
LOGGDP(-3)	-7.17E-12	0.031961	-2.24E-10	1.0000
LOGGDP(-4)	0.725234	0.056169	12.91159	0.0000
LOGBILAT	-0.036523	0.019305	-1.891907	0.0697
LOGMSPP	0.139695	0.044532	3.136984	0.0042
LOGMULT	-0.040055	0.032497	-1.232577	0.2288
LOGOTHE	0.082716	0.030679	2.696138	0.0121
LOGSOCS	0.027759	0.010050	2.761950	0.0104
Constant	1.392888	0.587238	2.371931	0.0254
Other Parameters Estimation and Diagnostic Tests for the ARDL model				
R ²	0.999242	F-statistic		3809.666
D-W statistic	0.916758	Probability (F-statistic)		0.000000
B-G statistic: F-test	0.005	χ^2 (HET)		0.001
RESET: F-test	0.007			

Note: D-W: Durbin-Watson statistic; B-G: Breusch-Godfrey statistic; RESET: Ramsey Regression Equation Specification Error Test; R²: coefficient of determination; χ^2 (HET): chi-squared heteroskedasticity statistic.

The Durbin-Watson (D-W) statistic of 0.917 creates a suspicion of possible existence of a first-order positive autocorrelation therefore, a Breusch-Godfrey Lagrange multiplier test for a higher-order serial correlation was conducted. However, the F-statistic and p-value of 0.005 rules out the existence of autocorrelation, overriding the D-W statistic result (with its inherent limitation). The chi-squared heteroskedasticity test was performed to ensure that the assumption of homoskedasticity was correct, which was confirmed by the χ^2 (HET) and F-statistic of 0.001.

The Ramsey regression equation specification error test (RESET) revealed that the model neither includes any irrelevant variables or excludes any relevant variables, the F-statistic of 0.007.

Table-4. Long-term estimation results.

Bound Test	(4, 0, 0, 0, 0, 0)				
Selected Model					
Test Statistic	Value	Signif.	I(0)	I(1)	
Asymptotic: n = 1000					
F-statistic	27.99		Lower Bound	Upper Bound	Decision
K	5	10%	2.08	3	NO Cointegration
		5%	2.39	3.38**	Cointegration
		2.5%	2.7	3.73	NO Cointegration
		1%	3.06	4.15	NO Cointegration

Note: **at 5% significance level.

Table 4 shows the long-term cointegrating effect of external debt on economic growth in Nigeria, represented by the F-statistic of the bound test. The result of 27.99, is linked to the lower and upper bound values of 2.39 and 3.38, respectively, at a 5% significance level (Pesaran *et al.*, 2001).

The F-statistic results of (27.99) exceed the upper bound of (3.38) at a 5% significance level as proposed by Pesaran *et al.* (2001). From the result, it is inferred that there is a long-term relationship between external debt and economic growth in Nigeria The F-statistic value clearly rejected the null hypothesis. To investigate the short-term effects, the error correction model (ECM) was applied.

As shown in Table 5, the error correction coefficient (CointEq(-1) value of (-0.26), with a p-value of 0.000, is statistically significant. In other words, as a direct estimation of the speed at which the dependent variable returns from short-term deviation (i.e., disequilibrium) to the long-term equilibrium following changes in the independent

variables, caused by mismanagement of external debt in earlier years leading to an intergenerational debt burden is corrected by 26% in the current year. These results support Lerner's view in Nigeria.

Table-5. Short-term (ECM) results.

Variable	Coefficient	Std. Error	t-Statistic	Probability
D(LOGGDP(-1))	-0.725234	0.025223	-28.75335	0.0000
D(LOGGDP(-2))	-0.725234	0.025223	-28.75335	0.0000
D(LOGGDP(-3))	-0.725234	0.025223	-28.75335	0.0000
CointEq(-1)*	-0.261487	0.005362	-48.76236	0.0000
Other Parameter Estimation for the ECM				
R ²	0.982909	D-W statistic		0.916758

5. DISCUSSION

From the ARDL results shown in Table 3, it is inferred that: debts to other creditors positively affects (i.e., increases) economic growth and human capital development by 8.3%; (M3) money supply positively affects them by 13.9%; government expenditure on social and community services by 2.8%. This supports the traditional economic theory that greater debt increases the money supply, as consumers purchase more goods and services, which stimulates economic growth. In contrast, debts to multilateral and bilateral creditors exert a negative impact, reducing economic growth and human capital development by 3.7% and 4%, respectively, which results in an intergenerational debt burden for future generations. The plausible justification for the negative relationship is most likely due to the poor management of the funds borrowed: investments with insufficient marginal returns to service the principal.

The bound test revealed a positive and significant long-term relationship between external debt and economic growth, while the error correction coefficient showed speed of convergence from long-run disequilibrium caused by mismanagement of external debt in earlier years leading to an intergenerational debt burden and declining economic growth returned to long-term equilibrium by 26% in the current year. Thus, in Nigeria, the Barro's provocative Hypothesis is valid in the long term and Lerner's view in the short term.

6. CONCLUSION AND RECOMMENDATIONS

This study explored the effect of external intergenerational debt on economic growth using quarterly data covering the period from 2006, following the debt cancellation, to 2018. The data was analyzed with the ARDL model to test for a long-term relationship and the ECM to correct the disequilibrium in debt management. The results implied that debts from other creditors and the money supply exerted a positive impact on economic growth whereas that from multilateral and bilateral creditors was negative. In addition, government expenditure on social and community services positively affected economic growth in Nigeria. Meanwhile, a long-term relationship was confirmed by the bound test and the ECM suggested that the speed with which the disequilibrium, due to the mismanagement of external debt in earlier years, returned to long-term equilibrium by 26% in the current year.

These findings suggest that if the government uses the funds borrowed in a productively, desirable economic growth could be achieved. Consequently, controlling crippling inflation and reducing the imports–exports gap, corruption, and increasing expenditure on security would help achieve the desired macroeconomic goals.

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