



RESEARCH ARTICLE

AN EMPIRICAL INVESTIGATION INTO THE IMPACT OF EXTERNAL DEBT ON ECONOMIC GROWTH  
IN NIGERIA

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ABSTRACT

The study analyses the impact of external on economic growth in Nigeria. The time series data were derived from various secondary sources such as: the Central bank of Nigeria statistical bulletins, Economic and Financial Review and Annual reports and statement of accounts and Federal Office of Statistics (FOS). Data were also extracted from Debt Management Office (DMO) publications and website. The macroeconomic data cover gross domestic product (GDP) and external debts from 1992-2012. The estimated techniques includes the Ordinary Least Square (OLS) method, Augmented Dickey- Fuller (ADF) unit root test, Johansen Co-integration test and Error Correction Method (ECM). The results revealed that external debt impacted positively on the economic performance of Nigeria. The paper also revealed that external debt is not significantly affecting economic growth in the country, but all the same, a good performance of an economy in terms of per capita growth may be attributed to the level of external debt in the country; therefore external debt is a stimulant to the economic progress of the country. The paper found that external debts if properly manage can lead to high growth level. A major policy implication of this result is that concerted effort be made by policy makers to manage the debt effectively by channeling them to productive activities (real sector) so as to increase the level of output in Nigeria, hence achieving the desire level of growth. Another policy implication of the study is that most developing countries contract debt for selfish reasons rather than for the promotion of economic growth through investment in capital formation and other social overhead capital. For debt to promote growth in Nigeria and other highly indebted countries fiscal discipline and high sense of responsibility in handling public funds should be the Watchword of these countries' leaders. External debt can only be reduced to the barest minimum by increasing output level (GDP).

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INTRODUCTION

Governments the world over resort to borrowing to accommodate the vacuum created by fiscal gaps in expenditure and revenue. The debt alternative becomes the likely option which the governments can provide social overheads for the people if it cannot compromise macroeconomic stability by printing more money and government taxation capability is limited. The Fiscal deficit experience by countries particularly developing ones is responsible for their borrowing to improve economic growth. Government borrows principally to finance public good to increase welfare and economic growth (Ogunmuyiwa, 2011). Due to the fact that the domestic financial resources are not adequate, external alternatives sources of borrowing seem to be the last option. In Nigeria, external debts are sourced from multilateral agencies, Paris club creditors, London creditors, Promissionary Notes to mention but few. These are the major sources of public receipts and its accumulation should accelerate economic growth. Ayadi and Ayadi, (2008), Were (2001) and Soludo (2003) in their separate investigations revealed that nations borrow for macroeconomic reasons to either finance capital investment and to circumvent hard budget constraint. Economies borrow to boost economic growth, improve standard of living and eradicate poverty. However, Nigeria has not recorded a reasonably economic growth and poverty reduction from external borrowings since 1960s. This is largely due to non-government investments of the funds borrowed in infrastructure that is capable of fostering growth and socio-economic development. Past investigations on the relationship between debt and growth on the Nigerian economy such

as Ariyo (1996), Adams and Bankole (2000) and Iyoha (2000) have not shown the channel through which debt could be growth promoting. Soludo (2003) argued that when debt reaches a certain level, it begins to have adverse effect, debts servicing becomes huge burden and countries find themselves on the wrong side of the debt-laffer curve, with debt crowding out investment and growth. The excessive fiscal deficit caused by debt servicing could cause slow economic growth in Nigeria. It is also responsible for our high debt burden resulting in numerous macroeconomic problems such as inflation, corruption, poverty and insecurity etc. It is worth-while to determine whether external debt could be growth promoting in Nigeria. That of course is the objective of this paper. The paper seek to examine the impact of external debt on economic growth in Nigeria

Theoretical Issues and Literature Review

Studies on external debts and economic growth relationships are numerous in literature in both developed and developing countries and revealed mixed results. However, most studies emerged findings that support the fact that external debt is growth and investment promoting. Theoretically, developing countries stand to benefit more if the marginal product of capital should be higher than the world interest rate (Eaton, 1993). However, external debts exploits the potentials a country without enhancing it. Indermit and Brian (2005) believe that the rate of returns on spending should exceed the marginal cost of borrowing on the assumption that debt is paid. Adepaju, Salau and Obayelu (2007) examined the effects of external debt management on economic growth of Nigeria between 1962 to 2006 using time-series data of the various bilateral and multi-lateral

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arrangements. Their study concluded that accumulation of external debt adversely affected Nigeria’s economic growth. Ogunmuyiwa (2011) examines whether external debts promotes economic growth in Nigeria using time series data from 1970-2007. The regression equation was estimated using econometric techniques such as Augmented Dickey –Fuller test, Granger causality test, Johansen co-integration test and Vector Error Correction Method. The results revealed that causality does not exist between external debt and economic growth. Karogol (2002) investigated both the short-run and long-run relationship between economic growth and external debt services for Turkey during 1956-1996. It also revealed that debt service is negatively related to economic growth in the long-run. Choong *et al.* (2010) examined the effect of different types of debts on the economic growth in Malaysia during the period 1970-2006. The study employed co-integration test, the findings suggest that all components of debts have a negative effect on long run economic growth. Other studies did not find a significant effect of debt on growth include Savvides,(1992) and Dijkstra and Hermes (2001). Similar studies that found positive relationship between debt and growth includes Cohen(1995), Bovensztem (1990), Elbadawi (1997) and Potillo *et al.* (2002,2003). Were (2001) using an error correction formulation, the estimation results showed overhung problem in both growth and investment equation. The result tally with result from similar studies (Elbadawi *et al.* 1996, Mbang and Sikod, 2001). Clement, Bhattacharya, and Nguyen (2003) examined the channels through which external debts affect growth in low income countries. Their result suggested that the substantial reduction in the stock of external debt projected for highly indebted poor countries (HIPC) would directly increase per capita income growth by about 1.0% per annum. Reduction in external debt services could also provide an indirect boost to growth through their effect on public investment. The estimation result for the growth equation showed that not only does past debt accumulation deters growth but so do current debt flow in the short run. The error correction term also showed the external debt has negative implications on growth. Ali and Mshelia, (2007) using Nigeria debt data found among others; positive and negative relations with GDP. Malik, Hayat, and Hayat (2010) revealed in Pakistan that external debt is negatively a significantly related to economic growth. The evidence suggested that increase in external debt will lead to decline in economic growth.

The result of the Granger causality tests showed that the Bullow and Rogof (1990) propositions that external debt of developing countries are a symptom rather than a cause of economic slowdown was rejected. The results confirm that a feedback or bi-directional relationship between debt and growth for Malaysia and Philippines. Karogol (2002) investigated the long run and short run relationship between external debt and economic growth for Turkey during 1956-1996 and Granger causality test results showed a unidirectional causality from debt to economic growth. Elbadawi *et al.* (1996) confirmed a debt servicing overhung effect on economic growth using cross-sectional regression for 99 countries spanning SSA, Latin America, Asia and Middle East. They concluded that debt accumulation deters growth and debt burden has led to fiscal distress as manifested by severely compressed budgets. Choong, Lau, Liew, and Puah (2010) examined the effect of different types of debts on the economic growth in Malaysia during the period 1970-2006. Their findings suggest that all components of debts have negative effects on long run economic growth. The granger causality test reveals the existence of short-run causality linkage between all debt measures and economic growth of Sudan’s economic growth. The casualty test showed unidirectional casualty between debt services and the economic growth. Also Hameed *et al.* (2008) on Pakistan analyzed the long run and short run relationship between external debt and economic growth. The study concludes that debt servicing burden has a negative effect on productivity and capital, there by adversely effecting economic growth.

**METHODOLOGY**

Sources of data: The time series data were derived from various secondary sources such as: the Central bank of Nigeria statistical

bulletins, Economic and Financial Review and Annual reports and statement of accounts and Federal Office of Statistics (FOS).Data were also extracted from Debt Management Office (DMO) publications and website. The macroeconomic data cover gross domestic product (GDP) and external debts between 1992-2012. The data gathered were subjected to various econometric tests with the aid of e-views.

The regression model is specified below:-

$$GDP = F(ED)$$

$$\text{Therefore } GDP = B_0 + B_1ED + \mu \text{ ----- (1)}$$

Where GDP is gross domestic product which proxy economic growth and ED is external debt.

The model: The study uses Granger causality test to determine the direction of causality between GDP and external debt in Nigeria from 1992 -2012. Other econometric test such as unit root test, co-integration and error correction mechanism were performed in order to ascertain the stationary of data and long run relationship between the variables.

The test procedure as described by Granger (1969) is illustrated below:

$$= \sum + \sum + \dots \dots \dots (1)$$

$$= \sum + \sum + \dots \dots \dots (2)$$

Bilateral causality exists when the sets of ED and GDP coefficient are statistically different from zero in both regressions (Gujurati,2004). The more general model with instantaneous causality as is expressed

$$\text{as: } + = \sum + \sum + \dots \dots \dots (1)$$

$$+ = \sum + \sum + \dots \dots \dots (2)$$

Also the estimated techniques includes the Ordinary Least Square (OLS)method, Augmented Dickey- Fuller (ADF) unit root test, Johansen Co-integration test and Error Correction Method (ECM). The estimations follow three step modeling procedure. Employing Augmented Dickey-Fuller Unit root test to make non-stationary variables stationary to overcome spurious results. After establishing stationary of the data, Johansen Co-integration test is applied to determine whether a long run relationship exist among the variables in question. When it is established that the variables are co-integrated, an over-parameterized model (ECM1) is developed which involves leading and logging of the variables after which parsimonious model (ECM2) is built in accommodate short-run dynamic in the model.

**DISCUSSION OF REGRESSION RESULTS**

Table 1 contains multiple regression results for the growth model. The results indicate that the coefficient of external debt is statistically insignificant while the constant is found to be statistically significant. Precisely, the coefficient of external debt is found to be statistically insignificant at 97.06percent level as indicated by their probability values 0.9706 and the coefficient of external debt is rightly signed (positive). This therefore, implies that 1percent increase in external debt raises the economic growth (GDP) by 1.36percent. The coefficient of external debt though not statistically significant but is consistent with the theoretical expectation. This high probability value (0.9706) implies that the presence of that effect that can invalidate the parameter is high. The constant is statistically significant implying that GDP does not only depend on external debt but other variables may affect GDP. The F-statistics value of 0.0014, which measure the joint effects of the explanatory variables, is insignificant at 97.06percent as indicated by the corresponding probability value 0.970556. This implies that at least one of the variables is statistically insignificant.

**Table 1. Regression Results**

Dependent Variable: IN\_GDP  
 Method: Least Squares  
 Date: 01/29/13 Time: 09:25  
 Sample: 1992 2012  
 Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.51364	5.072166	3.058582	0.0065
IN_EXTDEBT	0.013636	0.364599	0.037400	0.9706
R-squared	0.000074	Mean dependent var		15.70298
Adjusted R-squared	-0.052554	S.D. dependent var		1.383278
S.E. of regression	1.419162	Akaike info criterion		3.628402
Sum squared resid	38.26637	Schwarz criterion		3.727881
Log likelihood	-36.09822	Hannan-Quinn criter.		3.649992
F-statistic	0.001399	Durbin-Watson stat		0.068011
Prob(F-statistic)	0.970556			

**Table 2. Unit Root test at First Difference**

Null Hypothesis: D(IN\_GDP) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=1)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.919368	0.0617
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

\*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

**Table 3. Unit Root test at First Difference**

Null Hypothesis: D(IN\_EXTDEBT) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.139429	0.0405
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

**Table 4. Granger Causality test**

\*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations

Pairwise Granger Causality Tests

Date: 01/29/13 Time: 09:27

Sample: 1992 2012

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
IN_EXTDEBT does not Granger Cause IN_GDP	19	0.22150	0.8041
IN_GDP does not Granger Cause IN_EXTDEBT		1.26496	0.3126

and may not be accurate for a sample size of 19

The  $R^2$  value of 0.000074 implies that 0.0074 percent of the total variation in GDP is explained by variables captured by the regression equation. Coincidentally, the goodness of fit of the regression remained too low after adjusting for the degree of freedom as indicated by the adjusted  $R^2$  ( $R^2 = -0.052554$  or  $-5.2554\%$ ). The Durbin-Watson statistic 0.001399 in Table 1 is higher than  $R^2$  (0.000074) indicating that the model is non-spurious. The Durbin-Watson statistics 0.001399 is very low and less than 2 indicating the presence of/or positive autocorrelation.

### Discussion of Unit Root test Results

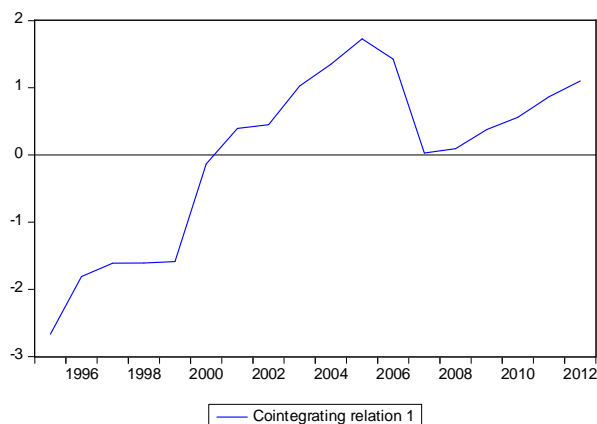
The results of unit root test in Tables 2 and 3, revealed that GDP is stationary at 10.0 percent only, and nonstationary at both 1.0 percent and 5.0 percent level. While external debt is stationary at both 5.0 percent and 10.0 percent and nonstationary at 1 percent level. Both GDP and external debt are found to be stationary at first difference (d(1)). GDP is stationary at first difference and at only 10 percent which is indicated by ADF results in Table 2 at 10.0 percent less than the critical values in negative direction. The ADF value for GDP is  $-2.919$  and the critical values are  $-3.832$ ,  $-3.030$  and  $-2.655$  at 1, 5, and 10 percent respectively. External debt is also stationary at first difference and at both 5.0 percent and 10.0 percent, which is indicated by ADF results in table 3 at 5.0 percent and 10.0 percent less than the critical values in negative direction. The ADF value for external debt is  $-3.139$  and the critical values are  $-3.832$ ,  $-3.030$ , and  $-2.655$  at 1, 5, and 10.0 percent respectively.

### Discussion of Granger Causality Results

As in Table 4, the results revealed no causation between GDP and external debt. That is External debt does not granger causes GDP, hence the null hypothesis is accepted at 80.41 percent as indicated by its probability value of 0.8041, and confirmed by its F-statistics value of 0.222. The results also revealed that GDP does not granger caused external debt. Also the null hypothesis is accepted at 31.26 percent, as indicated by its high probability value (0.3126), this is confirmed by its F-statistics value 1.265. This result therefore indicates no causation existed between GDP and external debt for the period under study. This signified the need to conduct cointegration test to find whether there exist a long run relationship between the variables under study.

### Discussion of Cointegration Results

The Johansen cointegration test results contain in Table 1 in appendix. Both the Trace and Max-Eigen statistics indicates nonexistence of long run relationship between GDP and external debt, as indicated by their values less than the critical values at all levels. The Trace and Max-Eigen statistics indicates no cointegrating equation at 5.0 percent level. The Log likelihood statistics indicate that there is one cointegrating equation and this equation is presented in the graph below. It implies that there existed long run relationship between the variables.



The graph above shows the cointegrating relation 1 between GDP and external debt. The longrun relation between these variables is negative from 1992 to 1999, zero in 2000, while positive from 2001 to 2012.

After correcting the errors found in the specification, the results still revealed no causation between GDP and External debt in the country for the period under review. Its indicates also the existence of longrun relationship between GDP and external debt with little improvement in  $R^2$  value of (0.037343) implying that 3.73 percent of total variation in GDP is explained by external debt.

### Concluding Remarks

The main objective of this study is to specifically examine the impact of External Debt on economic growth in Nigeria from 1992-2012. Ordinary least square method was used to establish a simple relationship between the variables under study. The results revealed that external debt impacted positively on the economic performance of Nigeria. The paper also revealed that external debt is not significantly affecting economic growth in the country, but all the same, a good performance of an economy in terms of per capita growth may be attributed to the level of external debt in the country; therefore external debt is a stimulant to the economic progress of the country. The paper found that external debts if properly manage can lead to high growth level. A major policy implication of this result is that concerted effort be made by policy makers to manage the debt effectively by channeling them to productive activities (real sector) so as to increase the level of output in Nigeria, hence achieving the desire level of growth. Another policy implication of the study is that most developing countries contract debt for selfish reasons rather than for the promotion of economic growth through investment in capital formation and other social overhead capital. For debt to promote growth in Nigeria and other highly indebted countries fiscal discipline and high sense of responsibility in handling public funds should be the Watchword of these countries' leaders. External debt can only be reduced to the barest minimum by increasing output level (GDP).

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**APPENDIX**

**Table 1. Johansen Cointegration test**

Date: 01/30/13 Time: 08:51  
 Sample (adjusted): 1994 2012  
 Included observations: 19 after adjustments  
 Trend assumption: Linear deterministic trend  
 Series: IN\_GDP IN\_EXTDEBT  
 Lags interval (in first differences): 1 to 1  
 Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.244978	5.382103	15.49471	0.7670
At most 1	0.002258	0.042946	3.841466	0.8358

Trace test indicates no cointegration at the 0.05 level  
 \* denotes rejection of the hypothesis at the 0.05 level  
 \*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.244978	5.339158	14.26460	0.6986
At most 1	0.002258	0.042946	3.841466	0.8358

Max-eigenvalue test indicates no cointegration at the 0.05 level  
 \* denotes rejection of the hypothesis at the 0.05 level  
 \*\*MacKinnon-Haug-Michelis (1999) p-values  
 Unrestricted Cointegrating Coefficients (normalized by b\*S11\*b=I):

IN_GDP	IN_EXTDEBT
0.572032	0.878718
0.775462	-0.876280

Unrestricted Adjustment Coefficients (alpha):

D(IN_GDP)	-0.000777	-0.012091
D(IN_EXTDEBT)	-0.246597	0.005316

1 Cointegrating Equation(s): Log likelihood -12.03636

Normalized cointegrating coefficients (standard error in parentheses)

IN_GDP	IN_EXTDEBT
1.000000	1.536133
	(0.97254)

Adjustment coefficients (standard error in parentheses)

D(IN_GDP)	-0.000444
	(0.03759)
D(IN_EXTDEBT)	-0.141061
	(0.06604)

**Table 2. Vector error Correctio Estimates**

Date: 01/30/13 Time: 08:57  
 Sample (adjusted): 1995 2012  
 Included observations: 18 after adjustments  
 Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CoIntEq1		
IN_GDP(-1)	1.000000		
IN_EXTDEBT(-1)	0.917085		
	(0.59718)		
	[ 1.53569]		
C	-28.64817		
Error Correction:	D(IN_GDP)	D(IN_EXTDEBT)	
CoIntEq1	-0.004739	-0.255955	
	(0.06350)	(0.10165)	
	[-0.07463]	[-2.51796]	
D(IN_GDP(-1))	-0.030708	-1.104557	
	(0.44143)	(0.70670)	
	[-0.06956]	[-1.56298]	
D(IN_GDP(-2))	-0.050328	-0.994065	
	(0.47949)	(0.76762)	
	[-0.10496]	[-1.29499]	
D(IN_EXTDEBT(-1))	0.080177	0.125079	
	(0.14961)	(0.23952)	
	[ 0.53590]	[ 0.52221]	
D(IN_EXTDEBT(-2))	0.009536	0.007940	
	(0.14390)	(0.23038)	
	[ 0.06627]	[ 0.03446]	
C	0.272143	0.449666	
	(0.15391)	(0.24639)	
	[ 1.76823]	[ 1.82499]	
R-squared	0.037343	0.463266	
Adj. R-squared	-0.363764	0.239627	
Sum sq. resid	1.228703	3.149130	
S.E. equation	0.319987	0.512277	
F-statistic	0.093099	2.071488	
Log likelihood	-1.381177	-9.851683	
Akaike AIC	0.820131	1.761298	
Schwarz SC	1.116921	2.058089	
Mean dependent	0.255792	-0.003305	
S.D. dependent	0.274008	0.587477	
Determinant resid covariance (dof adj.)		0.024668	
Determinant resid covariance		0.010963	
Log likelihood		-10.46311	
Akaike information criterion		2.718123	
Schwarz criterion		3.410635	

\*\*\*\*\*