

Does External Debt Promote Economic Growth in Nigeria?

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Abstract: The study examines whether external debt actually promotes economic growth in developing countries using Nigeria as a case study. Time series data from 1970-2007 were fitted into the regression equation using various econometric techniques such as Augmented Dickey Fuller (ADF) test, Granger causality test, Johansen co-integration test and Vector Error Correction Method (VECM). Empirical results reveal that causality does not exist between external debt and economic growth as causation between debt and growth was also found to be weak and insignificant in Nigeria.

Key words: Causality, co-integration, economic growth, error correction, external debt JEL CLASSIFICATIONS: H63, 040

INTRODUCTION

No doubt, governments borrow to fill the vacuum created by the fiscal gaps in the proposed expenditure and expected revenue within a fiscal period. If government does not want to compromise macroeconomic stability by printing more money and government taxation capability is limited, then debt option becomes the only available avenue that the government can explore to provide social overhead capital for the citizenry. Governments borrow in principle to finance public goods that increase welfare and promote economic growth. The spending has to be financed either through taxation, through seignorage, or with debt.

Three reasons could be advanced why debt may be preferred to taxation or money printing. Firstly, debt encourages tilting by allowing a more equitable manner in which a country can exploit investment with long gestation periods. Secondly, by smoothing a more efficient procedure for conducting counter-cyclical policies or meeting emergency spending needs are achieved. Adjusting taxes frequently may lead to efficiency losses and economic uncertainty. Third is the stability advantage of debt over taxation and seignorage. However, debt has to be repaid. Funds borrowed are simply postponed taxation. Hence, the use to which the funds are put and the returns relative to the cost of borrowing becomes crucial. If the government invests in infrastructure, such investments are capable of leading to faster 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. The question is how and to what extent can

such borrowed funds promote growth in developing economies like Nigeria? That of course is the objective of this paper. The paper seeks to determine whether external debt can be growth promoting in developing countries using Nigeria as a case study.

Review of empirical studies: Empirical studies on external debt-economic growth relationship are numerous in the literature in both developed and developing countries. Theoretically, it is expected that the marginal product of capital should be higher than the world interest rate for developing countries. Then, such countries would benefit from external borrowing (Eaton, 1993). However, external debt only helps to exploit the potentials of a country, it does not enhance it. Therefore, the only guideline is that the rate of return on spending should exceed the marginal cost of borrowing on the assumption that debt is paid (Indermit and Brian, 2005). Fischer (1993) while explaining the deficit-debt-growth relationship posited that larger budget surpluses are associated with more rapid growth through greater capital accumulation and greater productivity growth. He posited further that, high deficit may be consistent with low inflation for a while, but that a more detailed assessment of debt dynamics may be needed to see if the deficit is sustainable and therefore consistent with macroeconomic stability.

Savvides (1992) while trying to measure the impact of debt overhang on the country's economic performance used a Two Stage Limited Dependent Variable model (2SLDV) procedure by cross section time series data from 43 Less Developing Countries (LDCs) encountering debt problem. The study concludes that debt overhang and decreasing foreign capital flows have significant negative effect on investment rates. In line with Savvides (1992),

Deshpande (1997) attempted to explain the debt overhang hypothesis by an empirical examination of the investment experience of 13 severely indebted countries. The author argues that the adjustment measures, which are applied by severely indebted countries, have an impact on the indebted countries, since the investment crisis has typically implied a growth crisis for the highly indebted countries. Bauerfreund's (1989) findings also show that external debt payments obligations reduced investment levels in Turkey, in 1985. He asserted that the debt overhang is as a result of both internal and external economic policies.

Cohen (1993) estimated an investment equation for a sample of 81 developing countries over three sub-periods using O.L.S method. The author shows that the level of debt does not explain the slowdown of investment in highly rescheduling developing countries. Warner (1992) tried to measure the size of debt crisis effect on investment with Least Square estimation for 13 less developed countries over the period 1982-1989. He affirmed that the reasons behind the decline of investment in many heavily indebted countries are declining export prices, high world interest rates and sluggish growth in developed countries. Rockerbie (1994) criticized Warner (1992) of various shortcomings. Rockerbie (1994) used O.L.S for each of the 13 countries over a sample period 1965-1990 and the results affirm that the debt crisis of 1982 had significant effects in terms of dramatic slowdown of domestic investment in less developed countries. Afxentiou and Serietis (1996) in furtherance to Afxentiou (1993) examined 55 developing countries facing debt service difficulties. The study's objective was to find out the relationship between foreign borrowing and productivity over the period 1970-1990. The results show that during the period 1970-1980, the relationship between indebtedness and national productivity is not negative. They submitted that the developing countries used the foreign loans to absorb the shock from oil price increases as painless as possible. However, for the period 1980-1990 when the debt forgiveness and rescheduling started, the debt crisis and debt overhang affected some indebted countries economic growth.

Fosu (1996) tested the relationship between economic growth and external debt in sub Saharan African countries over the period 1970-1986 using O.L.S method. The study examined the direct and indirect effect of debt hypothesis. Using a debt- burden measure, the study reveals that direct effect of debt hypothesis shows that GDP is negatively influenced via a diminishing marginal productivity of capital. The study also finds that on the average a high debt country faces about one percent reductions in GDP growth annually. Fosu (1999) also employed an augmented production function to investigate the impact of external debt on economic growth in sub Saharan African countries for the period

1980-1990. The author tested whether external debt as negative effect on economic growth and the findings show that debt exhibits a negative coefficient. Cunningham (1993) examined the association between debt burden and economic growth for 16 heavily indebted nations during the period 1971-1987. The study concludes that the growth of a nation's debt burden had negative effect on economic growth during the period 1971-1979. Smyth and Hsing (1995) tried to test the impact of federal government's debt on economic growth and examine if the optimal debt ratio exists that will maximize growth. The debt/GDP ratio corresponding to the maximum GDP growth rate was found to be 38.4%. The results show that during 1980s and early 1990s, federal debt has a different role in economic growth. In the early 1980s, debt ratio rose but it was below 38.4, thus debt-financing stimulates economic growth.

Debt-economic growth nexus has also found significance among several other scholars. Essien and Onwioduokit (1998) examine the impact of foreign debt on economic growth and they found that the degree of responsiveness of growth to external finance in Nigeria is elastic. By implication government should only put in place appropriate debt management strategies to enhance economic growth. The debt burden of a country and the consequent debt service impose a constraint on the economy in terms of insufficient foreign exchange to finance importation of raw materials and capital goods needed for economic growth. Another serious constraint is found in debt overhang theory which states that accumulated debt burden adversely affect the rate of private investment. The debt stock acts as a tax on future income and production and discourages investment by the private sector.

Studies including Sach's (1986) have made a theoretical case for debt overhang effect by analyzing the crowding out effect of debt on service payments. They posit that many highly indebted poor countries frequently divert foreign exchange resources to meet pressing debt service obligation. Of interest to policy makers presently is the effect of the debt relief granted some African countries and as put by Burnside and Fanizza (2004), it differs from previous major debt relief initiatives in that it requires that budgetary resources saved from debt service be used for poverty reduction purposes. This view however need be interpreted with caution as many countries in Africa have specific - country problems which may not allow the impact of the debt reduction be felt by the common man. For example in Nigeria, rather than having a positive feel of the debt relief, the standard of living of an average Nigeria has worsened due to escalating prices of essential commodities and growing food shortages.

In the findings of Iyoha (2000), he opines that a 75% debt stock reduction would have raised the

investment - GDP ratio by 8.6% and increased GDP by 7.8% and the debt/GNP ratio would have fallen by 65%. No doubt, the debt reduction is expected to promote growth. In a study conducted by Chauvin and Kraay (2005) on a sample of 62 low-income countries assessed the extent to which debt relief induces government to embark on social spending. They conclude that the marginal benefits of debt relief may not be same in Africa, Latin America and Asia. Lora and Olivera (2006) test the crowding out effect of public debt on social services between 1985 and 2003 and find that the effect comes mostly from stock of debt and not debt service. They posit that loans from multilateral organization do not ameliorate the adverse consequences of debt on social expenditures. Thus, if Lora and Olivera's (2006) results hold for Africa, beneficiaries of debt relief should have increased their expenditure in the social sector (Dessy and Vencatachellum, 2007). Evidences from (Dessy and Vencatachellum, 2007) study however show that if a government has a high discount factor, it will rather consume than invest once debt relief is granted. This is particularly true of most developing countries that have high marginal propensity to import. These findings are consistent with Cooper and Sachs (1985) and Arslanalp and Henry (2004) who argue that the problem faced by debt-relieved countries is lack of good institutions. Thus, if the status-quo remains the same, the new debt-relief initiative would not achieve their objectives to increase growth promoting expenditure in these countries. Similar studies that have found relationship between debt and growth include Cohen (1995), Bovensztem (1990), Elbadawi *et al.* (1997) and Patillo *et al.* (2002, 2003). Few other studies did not find a significant effect of debt on growth and they include Savvides (1992) and Dijkstra and Hermes (2001).

On causality analysis of external debt and growth, Afxentiou and Serletis (1996a) used Granger causality test on a sample of 55 severely indebted countries and the results affirm that no causality exists between debt and income. The tests show that indebtedness is not a specific factor of per capital income growth. Hence, foreign resources can have a positive effect on economic development if resources are transferred into inputs since borrowing countries need to have these scarce resources. Amoateng and Amoako (1996) investigated the relationship between external debt and growth for 35 African countries using Granger causality test. The results show that there is a unidirectional and positive causal relationship between debt service and economic growth. Chowdhury (1994) tried to resolve the Bullock and Rogoff's (1990) proposition by finding the cause and effect relationship between external debt and economic slowdown in 7 Asian countries for the period 1970-1988. The results of the Granger causality tests show that the Bullock and Rogoff (1990) propositions that external debt

of developing countries are a symptom rather than a cause of economic slowdown was rejected. The results confirm a feedback or bi-directional relationship between debt and growth for Malaysia and Philippines. Karagol (2002) investigated the long run and short run relationship between external debt and economic growth for Turkey during 1956-1996 and the Granger causality test results showed a unidirectional causality from debt to economic growth.

MATERIALS AND METHODS

This study makes use of time series data sourced from statistical Bulletin, Economic and Financial Review and Annual Reports and Statement of Accounts of the Central Bank of Nigeria (CBN) and the Federal Office of Statistics (FOS). The macroeconomic data cover gross domestic product (GDP) and external debt between 1970 and 2007 in Nigeria. The data gathered were then subjected to various econometric tests using E-views.

The model: The model for this study uses Granger causality test to ascertain the direction of causality between GDP and external debt in Nigeria between 1970 and 2007. Other econometric tests such as unit root test, co integration test and error correction mechanism were also performed to determine the stationarity of the data and the long run relationship between the variables.

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

$$GDP_t = \sum_{j=1}^K A_j ED_{t-i} + \sum_{j=1}^K B_j GDP_{t-j} + U_{it} \quad (1)$$

$$ED_t = \sum_{j=1}^K C_j ED_{t-i} + \sum_{j=1}^K D_j DGP_{t-j} + U_{2t} \quad (2)$$

Equation (1) postulates that current GDP is related to past values of itself as well as that of ED and vice-versa for Eq. (2). Unidirectional causality from ED to GDP is indicated if the estimated coefficient on the lagged ED in equation (1) are statistically different from zero as a group (i.e., $\sum A_i \neq 0$) and the set of estimated coefficients on the lagged GDP in Eq. (2) is not statistically different from 0 (i.e., $\sum D_j = 0$). The converse is the case for unidirectional causality from GDP to ED.

Feedback or bilateral causality exists when the sets of ED and GDP coefficient are statistically different from 0 in both regressions (Gujarati, 2004).

The more general model with instantaneous causality is expressed as:

Table 1: Unit Root Test (GDP and ED: (1970-2007))

VAR	ADF	Stage	1%	5%	10%
GDP	-5.7481* **	Level	-3.6228	-2.9446	-2.6105
ED	-1.380851	Level	-3.6171	-2.9422	-2.6092
ED	-4.541506* **	1 st Difference	-3.6228	-2.9446	-2.6105

*: Significant @ 1%; **: Significant @ 5%

Table 2: Pairwise Granger Causality Test (1970-2007)

Hypothesis	F-statistics	Lags	Decision
ED does not GC GDP	0.16758(0.84649)	2	Accept
GDP does not., ED	0.59820(0.55623)	2	Accept
ED does not., GDP	0.25096(0.85994)	3	Accept
GDP does not., ED	0.42260(0.73831)	3	Accept
ED does not., GDP	0.26886(0.89509)	4	Accept
GDP does not., ED	0.88789(0.48617)	4	Accept

Critical level: 1% = 7.3; 15% = 4.08; 10% = 2.84

$$GDP_t + bo ED_t = \sum_{j=1}^K A_j ED_{t-i} + \sum_{j=1}^K B_j GDP_{t-1} + U_{it} \quad (3)$$

$$ED_t + CoGDP = \sum_{j=1}^K C_i ED_{t-i} + \sum_{j=1}^K D_j GDP_{t-j} + U_{2t} \quad (4)$$

Instantaneous causality occurs and knowledge of GDP will improve prediction or goodness of fit of the first equation for ED.

In this study, a bivariate regression of the form presented below is estimated:

$$ED_t = \alpha_0 + \alpha_1 ED_{t-1} + \dots + \alpha_1 ED_{t-1} + \beta_1 GDP_{t-1} + \dots + \beta_1 GDP_{t-1} \quad (5)$$

$$GDP_t = \alpha_0 + \alpha_1 GDP_{t-1} + \dots + \alpha_1 GDP_{t-1} + \beta_1 ED_{t-1} + \dots + \beta_1 GDP_{t-1} \quad (6)$$

The equation for the second model is stated thus:

$$GDP_t = f(ED_t) \quad (7)$$

$$GDP_t = \beta_0 + \beta_1(ED_t) + \mu_t \quad (8)$$

To avoid spurious regression outcomes on time series data, unit root test that affirms the stationarity of the series and co integration test that confirms at least one co integrating equation were conducted. Sequel to the above, the O.L.S in Eq. (8) is re-specified to take care of possible short term disequilibrium as follows:

$$\Delta GDP = \beta_0 + \beta_1 \Delta (ED) + \beta_2 \mu_{t-1} + \Sigma_t \quad (9)$$

β_1 is expected to be >0

where,

GDP = Gross Domestic Product measured by GDP growth rate

ED = External Debt measured by external debt/GDP percent

Unit root test: Since carrying out regressions on non stationary time series data would lead to spurious regression outcomes, we employ the widely used Augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979) to ascertain the stationarity of the data.

The econometric views (E-views package was employed) to carry out the regressions.

DISCUSSION

Before determining the level of causality or otherwise between external debt and economic growth, it is contingent upon us to subject the series to unit root test to determine their stationarity. Using the Augmented Dickey Fuller (ADF) test as presented in Table 1, the results show that gross domestic product proxied by GDP growth rate was stationary at level and is thus found to be of order I(0) with ADF @ -5.74891 while external debt still contain a unit root at levels. By applying 1st differencing to the series external debt (ED) was found to be stationary with ADF @ -4.541506 and is thus found to be of order I(1) at both 1 and 5% levels of significance (Table 1).

Having affirmed the stationarity of the series, we then proceeded to finding the causality using the Granger causality test as defined by Granger (1969). The results as shown in Table 2 fail to support any strict causality between External Debt (ED) and economic growth in Nigeria despite the lag length from lags 2-4. Thus, it can be affirmed that the variables are exogenous of one another, albeit, the degree of exogeneity between the variables cannot be easily determined. Hence, it can be stated that external debt is not a specific factor determining the rate of economic growth or economic slowdown in Nigeria. The period 1985 through 1993 when the country embarked on Structural Adjustment Programme (SAP) coincided with a period when external debt was at its peak but this could not translate into increased growth (Fig. 1 and 2). This finding is in confinement with Afxentiou and Serletis (1996a) which posits that indebtedness is not a specific factor of per capital income growth and Bullow and Rogof (1990)

Table 3: Johansen co integration Test (1970-2007)

Eigen Value	Likelihood ratio	5%	1%	Hypothesized CE
0.547394	30.76100	15.41	20.04	None**
0.059871	2.222583	3.76	6.65	At most 1

L.R indicates 1 co integrating equation(s) @ 5% level.

Table 4: Vector error correction mechanism (VECM 1970-2007)

DEP Var = D(GDP)		
D (GDP-1)	-0.506005 (0.16320) (-3.10043)	R ² = 0.283514 Adjusted R ² = 0.211865 F-Test = 3.957007 Akaike A/C = 9.938431 Schwarz SC = 10.11800
D (GDP-2)	-0.394900 (0.16267) (-2.42767)	
C	-5.265202 (8.79915) (-0.59838)	
ED	0.182797 (0.25696) (0.71139)	

Standard errors and t-statistics are in parenthesis

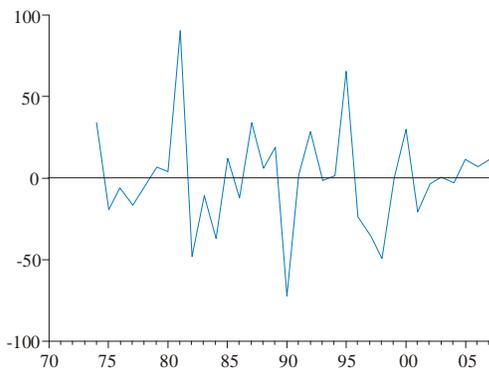


Fig. 1: GDP residuals

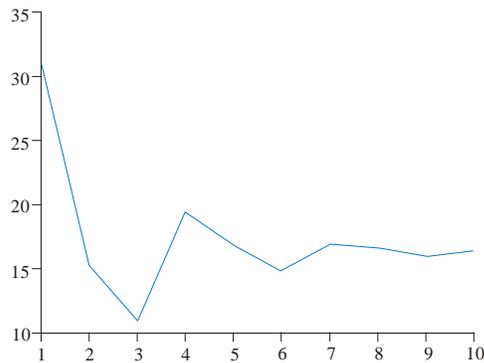


Fig. 2: Response of GDPGR to One S.D. GEPGR Innovation

propositions that external debt of developing countries are a symptom rather than a cause of economic slowdown.

In Table 3, the long run relationship between debt and growth was confirmed with the Johansen co-integration test and the result shows that at least one co-

integrating equation exists. Thereafter, the re specified error correction Eq. (9) was tested using the ECM to take care of short run disequilibrium in the model. The result in Table 4 shows that the explanatory variable is correctly signed indicating a positive relationship between debt and growth. It also shows that it will take at least 2 lags of GDP for GDP to adjust to external debt. R² stood at 0.283514 meaning only about 28% variation in GDP is accounted for by external debt. The t-statistics of the explanatory variable is insignificant and the F-statistics could only confirm the significance of the overall regression equation at the 10% level but not at the conventional 1 and 5% levels of significance. Comparing values of the AIC and SIC for lags 2, 3 and 4, lag 2 is preferred because it gave us the lowest value of AIC and SIC and a reasonable value of R² and F-statistics.

CONCLUSION AND POLICY IMPLICATION

The paper seeks to determine whether external debt can promote economic growth in a developing economy like Nigeria. Empirical results have shown clearly that causation between external debt and growth could not be established in the Nigerian context and external debt could thus not be used to forecast improvement or slowdown in economic growth in Nigeria. As causality could not be established, causation between debt and growth in Nigeria is also weak and insignificant, and as such, changes in GDP cannot be predicted with changes in external debt.

The 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. The periods 1985-1995 and 2000-2004 were periods of high debt/GDP percent but slow and (or) negative GDP growth rates in Nigeria. This situation is not unconnected with wasteful expenditures and high level of financial indiscipline on the part of Nigerian leaders at this time. This led to high debt overhang during the period and fall in foreign investment and growth. 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.

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