

The Effect of Public Debt on Economic Growth in Nigeria

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Abstract: *The scarcity of resources has often made governments to search for sources to augment the available funds for developmental purposes. This scenario necessitate the need to borrow funds with a view to promote economic growth. This study evaluates the impact of such borrowings by government and allied institutions on the economic development of Nigeria over 56 years (1960 – 2015). The study employs an error correction model (ECM) to estimate the relationship. It observes that there is a positive correlation between the proxy for domestic debt and economic development while the proxy for domestic debt service payment is negative and significant. This suggests that domestic debt is contributing to the advancement of the economy while the repayment has inverse relationship with economic growth. The proxy for external debt and external debt service payment were negative though insignificant. The result calls for a significant change in the source of public debt from external sources to domestic sources. Government should look inwards to fund budget deficit while serious efforts should be put in place to reduce the external debt burden.*

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I. Introduction

Funding is an essential ingredient for the growth of an economy. At times this funding may not be available hence the government often results into borrowing from sources that are willing to lend so far the criteria for borrowing is met. Economic theory suggests that reasonable level of borrowing by a developing country is likely to enhance its economic growth (Patillo, et al 2002). Public debt is the amount of money owed by the government to institutions, government agencies and other bodies either resident in or outside a country (Hassan and Akhtar 2012). It can be classified as sum of external debt and domestic debt and indicates how much public spending is financed by borrowing instead of taxation (Chowdhury 2001). Domestic debt is the amount of debt owed to residents of a country by the government. In Nigeria, domestic debt can be sourced from the Central Bank of Nigeria, Deposit Money Banks and the Non-Banking public via Treasury bills, Treasury certificates, Government Development Stock, among others. On the other hand, external debt is debt owed to residents outside a country by the government and this can be sourced through Paris Club of Creditors, London Club of Creditors, Multilateral Creditors, Bilateral Creditors, Private Sector Creditors and Promissory Notes holders. Thus, public debt is one of the instruments used to cover deficits in budget. The positive effects of public debt to countries pertain to the reality that in resource-starved economies, debt financing if done properly contributes to higher growth and increases a country's capacity to service and repay external and internal debt.

The relationship between public debt and economic growth has been carried out by various scholars in the literatures which reveal contradicting results. Some are of the opinion that both external debt and domestic debt influence the economic growth, while others see it from the perspective that either external debt or domestic debt influences the economic growth. In the same token, other scholars see it from the perspective of duration, some says public debt influences economic growth in the short run while others are of the opinion that public debt influences economic growth in the long run. This research therefore seeks to investigate the effect of public debt on economic growth using Nigeria as a case study. The study covers a period from 1960 to 2015 (56 years) and uses Error Correction Method to estimate the relationship.

II. Literature Review

The theory on public debt could be traced to Adam Smith who championed the classical view. He opined that public debt will inflict unnecessary burden on the populace. They argued that everybody as long as he does not engage in illegal activities should be free to pursue their personal interest in such a way that it enhances performance. This view was contended by David Ricardo who asserts that public debt is a terrible way to afflict a nation. He argues that every government expenditure may not be unproductive while shifting of debt concept may not be true.

Subsequently, modern theorist that appeared after the great depression of the 1930's such as Keynes viewed public debt as a national asset rather than a liability and that continuous deficit spending is essential to

the economic property of nations. They further argued that the size of debt does not matter while additional flow of income generated by additional debt facilitates increase in payment of taxes that is ultimately used to service the debt. Several views thereafter followed these arguments in greater detail.

Many studies have been carried out in the literature to examine the relationship between public debts and economic growth in the developed countries and developing countries including Nigeria. However, the results and discussions are not settled as presented below:

Cristina and Philipp (2010) analysed the impact of high and growing government debt on economic growth, finds evidence for a non-linear impact of public debt on per-capita GDP growth rate across twelve Euro area countries over a long period of time starting in 1970. The analysis unveils a concave (inverted U-shape) relationship between the public debt and economic growth rate with the debt turning point at about 90-100% of GDP. This means that a higher public debt-to-GDP ratio is associated, on average, with lower long-term growth rates at debt levels above the range of 90-100% of GDP. Checherita and Rother (2010) investigated the average impact of government debt on per-capita GDP growth in twelve Euro area countries over a period of 40 years starting from 1970. They found a non-linear impact of debt on growth with a turning point—beyond which the government debt-to-GDP ratio has a deleterious impact on long-term growth—at about 90-100% of GDP. Their results further suggested that the negative growth effect of high debt may start from levels of around 70-80% of GDP, which calls for even more prudent indebtedness policies.

Reinhart and Rogoff (2010), used simple correlation statistics to estimate the relationship between public debt and the long-term real GDP growth rate in a sample of 20 developed countries over a period spanning about two centuries (1790 - 2009). The study finds that the relationship between government debt and long-term growth is weak for debt/GDP ratios below a threshold of 90% of GDP, but when the ratio is above 90%, the median growth rate falls by one percent and the average by considerably more. A similar change in the behaviour of GDP growth in relation to the debt ratio is also found by Kumar and Woo (2010).

Similarly, Qureshi and Ali (2010) empirically explored the impact of high public debt burden on the economy of Pakistan from 1981 to 2008. The study opines a negative impact of public debt on the economy of Pakistan over the period considered. Akram (2010) investigated the effect of debt on the economy of Pakistan using Autoregressive Distributed Lag (ARDL) technique. The paper suggests that public debt is negatively related to investment hence economic growth

Hassan and Akhter (2012) analyzed the effect of public debt burden on the economic growth of Bangladesh. The sample period was 1980-2011 and estimated the relationship with the use of Error Correction Model (ECM). Empirical results reveal that there is no significant negative relationship between external debt and economic growth. They also found that domestic debt has a negative impact on growth with a weak statistical level of significance. Saifuddin (2016) examined the relationship between public debt and economic growth in Bangladesh. The empirical findings of the study indicate that public debt has made a significant contribution to economic growth, as measured by GDP, not only directly but also indirectly via its effect on investment because the public debt induces investment over time and this, in turn indirectly enhances economic growth.

In Nigeria, Adepoju et al (2007) analyzed the effects of external debt management on sustainable economic growth and development in Nigeria using time series data over a period from 1962 to 2006. Exploring time to time behavior of donor agencies as an outcome of various bilateral and multilateral arrangements, they concluded that accumulation of external debt hampered economic growth in Nigeria. Adofu and Abula (2010) also examined the relationship between domestic debt and economic growth in Nigeria for the period 1986 – 2005 and found a negative relationship between domestic debt and economic growth. Likewise, Onyeiwu (2012) employed ordinary least squares (OLS) on error correction model to investigate the relationship between domestic debt and economic growth during the year 1994 to 2008. The study found domestic debt stock holding by government to be far above a healthy threshold of 35 per cent of bank deposit, thereby providing evidence of private investment crowd out in addition to negative growth effect during the period investment. Aminu and Anono (2012) conducted a study on external debt relationship in Nigeria and found that external debt impacted positively on the growth of the economy within the period under review. External debt does not cause GDP, but the flow of causation runs from GDP to external debt.

Amassoma (2011) examined the causal nexus between external debt, domestic debt and economic growth in Nigeria between 1970 and 2009 using a Vector Autoregressive (VAR) and a Vector Error Correction (VEC) models. The findings show that whereas there was no long-run relationship between domestic debt and economic growth external debt and economic growth showed a long-run relationship. It was evident from the findings that there existed a bi-directional causality between internal debt and economic growth; this implied that both internal debt and economic growth leads to one another. However, the result of the causality between external debt and economic growth showed a unidirectional causality from economic growth to external debt and not vice versa, this implied that it is economic growth that lead to external debt and not external debt leading to economic growth. This result showed that external debt has not contributed to the growth of the

Nigerian economy rather domestic debt have contributed significantly to economic growth in Nigeria and in the same vein, economic growth can be a very significant factor or determinant of internal debt.

Oluitan and Balogun (2013) examined the effect of foreign debt on the Nigerian economy from 1960 to 2012. The result opines that foreign debt has a negative relationship with output level of gross domestic product. Emmanuel (2012) focused on the impact of public debt on economic growth in Nigeria. The study shows that the impact of debt on economic growth is negative and quite significant in the long-run but become positive in the short-run. This was attributed to incompetent debt management. Aminu et al (2013) examined the impact of domestic debt and external debt on economic growth in Nigeria from 1970-2010 using ordinary least square method to establish a simple relationship between the variables under study. The results revealed that external debt possessed negative impact on the economic performance of Nigeria while domestic debt possessed positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity.

Okonet al (2013) investigated the relative impact or potency of both external and domestic debts on the performance of the Nigerian economy with emphasis on which of the debt type exert more impact or influence on the major macroeconomic variables of per capita GDP and gross domestic investment. They used time series data from 1970 to 2011 and observes that external debt is superior to domestic debt in terms of economic growth. External debt and not domestic debt crowd-out domestic investment in Nigeria. They concluded that government should have recourse to domestic market-based borrowing in order to help mobilize domestic savings and stimulate domestic investment in Nigeria.

From the foregoing, the literature is not settled on the impact of public debts on economic growth. The nature and extent of the effect of public debts on Nigeria economic growth has not been conclusively agreed. The presence of this lingering gap is the driving force behind this study.

ESTIMATION TECHNIQUES AND MODEL SPECIFICATION

The study uses historical data from 1960 to 2015 and employs econometric methodology such as descriptive statistics, unit root tests for stationarity of each variable and co-integration test to test for the presence of long run relationship. Error Correction Model (ECM) is used to estimate the relationship.

The model that was tested in this study is: -

$$GDPPC = f(EDS, DDS, ESP, DSP) \tag{1}$$

The stochastic form of the model is:

$$GDPPC = \beta_0 + \beta_1EDS + \beta_2DDS + \beta_3ESP + \beta_4DSP + \mu \tag{2}$$

GDPPC represents Gross domestic product per capita; EDS represents External debt stock; DDS represents Domestic debt stock; ESP represents External debt service payment; DSP represents Domestic debt service payment; ε_{it} represents Error term; β_0 represents Intercept.

The following are the *a priori* expectations regarding the signs of the coefficients of independent variables including the constant. Therefore, the following are the ‘*a priori*’ expectations:

$$\beta_1 > 0 \text{ and } \beta_2 > 0, \\ \beta_3 < 0 \text{ and } \beta_4 < 0$$

III. Data Analyses and Results

Descriptive statistics was carried out and the result is presented in table 1 below

Table 1: Descriptive Analysis Results

| | GDPPC | EDS | DDS | ESP | DSP |
|--------------|----------|----------|----------|----------|----------|
| Mean | 68418.07 | 730.4860 | 1116.408 | 96.72891 | 117.5715 |
| Median | 1531.780 | 133.9600 | 47.0300 | 9.240000 | 0.000000 |
| Maximum | 516712.2 | 4890.270 | 8837.000 | 1271.540 | 897.4800 |
| Minimum | 48.51000 | 0.050000 | 0.30000 | 0.000000 | 0.000000 |
| Std. Dev. | 138880.2 | 1210.243 | 2162.038 | 255.6948 | 232.5645 |
| Skewness | 2.249674 | 2.025665 | 2.309546 | 3.726295 | 2.232985 |
| Kurtosis | 6.739948 | 6.222414 | 7.303443 | 16.07416 | 6.982788 |
| | | | | | |
| Jarque-Bera | 78.44684 | 61.41031 | 91.33582 | 519.0045 | 82.05883 |
| Probability | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| | | | | | |
| Sum | 3762994. | 40176.73 | 61402.43 | 5320.090 | 6466.430 |
| Sum Sq. Dev. | 1.04E+12 | 79093144 | 2.52E+08 | 3530512. | 2920657. |
| | | | | | |
| Observations | 55 | 55 | 55 | 55 | 55 |

Source: Author's computation using E-views 9.0

The table above shows the summary of the outcome of the descriptive analysis of each variable and shows that the variables are not normally distributed.

Results of Unit Root Test using ADF

We use the Augmented Dickey-Fuller approach and the output is shown below:

Table 2: Unit Root Test Results

| Variables | ADF t-statistics | Critical value | P-value | Order of integration |
|-----------|------------------|----------------|---------|----------------------|
| GDPPC | -5.332946 | -2.922449 | 0.0000 | I (1) |
| EDS | -4.619213 | -2.917650 | 0.0004 | I (1) |
| DDS | -7.347541 | -2.917650 | 0.0000 | I (1) |
| ESP | -3.570596 | -2.917650 | 0.0097 | I(0) |
| DSP | -6.174597 | -2.916566 | 0.0000 | I(1) |

Source: Author's computation using E-views 9.0

From the results of table 2, only ESP i.e. External Service Payment is stationary at level while all the other variables are stationary at first difference. Due to this, we estimate the Johansen Cointegration test to examine the possibility of the existence of long run relationship amongst the variables. The result is presented in table 3 and 4 below.

Table 3: Johansen Co-integration Test using Trace Statistic

Unrestricted Cointegration Rank Test (Trace)

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
|---------------------------|------------|-----------------|---------------------|---------|
| None * | 0.880752 | 253.6465 | 69.81889 | 0.0000 |
| At most 1 * | 0.736433 | 140.9393 | 47.85613 | 0.0000 |
| At most 2 * | 0.546662 | 70.26648 | 29.79707 | 0.0000 |
| At most 3 * | 0.307212 | 28.33720 | 15.49471 | 0.0004 |
| At most 4 * | 0.154336 | 8.884557 | 3.841466 | 0.0029 |

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's computation using E-views 9.0

Table 4: Johansen Co-integration Test using Max-Eigen Statistic

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

| Hypothesized No. of CE(s) | Eigenvalue | Max-Eigen Statistic | 0.05 Critical Value | Prob.** |
|---------------------------|------------|---------------------|---------------------|---------|
| None * | 0.880752 | 112.7072 | 33.87687 | 0.0000 |
| At most 1 * | 0.736433 | 70.67278 | 27.58434 | 0.0000 |
| At most 2 * | 0.546662 | 41.92927 | 21.13162 | 0.0000 |
| At most 3 * | 0.307212 | 19.45265 | 14.26460 | 0.0069 |
| At most 4 * | 0.154336 | 8.884557 | 3.841466 | 0.0029 |

Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's computation using E-views 9.0

From the estimation of the trace statistics and maximum Eigen value statistics, the results suggest existence of long run relationships among the variables for all the cointegrating equations from none to maximum of 4. It is therefore safe to estimate the relationship which in this study will be done using the Error Correction Method. The result is presented in table 5 below.

Table 5: Results of OLS estimation using ECM

Dependent Variable: D(D(LOG(GDPPC)))

Method: Least Squares

Sample (adjusted): 1963 2015

Included observations: 19 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|-----------|
| C | 0.130694 | 0.219490 | 0.595446 | 0.5618 |
| D(EDS) | -0.000125 | 7.56E-05 | -1.660034 | 0.1208 |
| D(D(LOG(DDS))) | 0.902298 | 0.390715 | 2.309351 | 0.0380 |
| LOG(ESP) | -0.015137 | 0.044038 | -0.343721 | 0.7366 |
| D(LOG(DSP)) | -0.294238 | 0.152698 | -1.926931 | 0.0761 |
| ECM(-1) | -2.107168 | 0.423326 | -4.977643 | 0.0003 |
| R-squared | 0.679203 | Mean dependent var | | -0.014737 |
| Adjusted R-squared | 0.555820 | S.D. dependent var | | 0.288329 |
| S.E. of regression | 0.192162 | Akaike info criterion | | -0.208864 |
| Sum squared resid | 0.480042 | Schwarz criterion | | 0.089380 |
| Log likelihood | 7.984205 | Hannan-Quinn criter. | | -0.158389 |
| F-statistic | 5.504818 | Durbin-Watson stat | | 2.049427 |
| Prob(F-statistic) | 0.006144 | | | |

Source: Author's computation using E-views 9.0

The result shows that only DDS has a positive relationship with GDPPC with a 0.902298 coefficient that is significant at 5%. DSP is equally significant but has an inverse relationship with GDPPC. This finding aligns with our a priori expectation for the study because repayment of debt will reduce available funds for development when effected hence the inverse relationship. Both EDS and ESP have no significant relationship with GDPPC although the coefficients have negative sign suggesting possible inverse relationship. This result posits that only domestic debt exerts positive relationship on economic growth and aligns with the study of Amassoma (2011) and that of Aminu et al (2013).

The ECM coefficient is -2.107168 and significant at 1%. This depicts proper specification of the model. The Durbin Watson report is 2.049 which suggests absence of auto correlation. R^2 value is 0.6792 which means that about 67.92% of the total variation of the GDPPC values is explained by the independent variables. This implies that the power of EDS, DDS, ESP and DSP explaining GDPPC is relatively strong while the balance can be attributed to the factors included in the disturbance variable u_t .

IV. Conclusion

Based on the aforementioned findings, the external debt stock and its service payments are insignificant to the Nigerian economic growth (that is, a rise or fall in the Nigerian economic growth is not determined by the external debt stock nor its service payments) and as such should not be resorted to in times of need as it will not lead to any progress in the growth of the Nigerian economy.

Domestic debt serves as a useful tool and should be encouraged as it positively affects the economic growth of the nation but the loans borrowed should be repaid as soon as possible as the service payments of domestic debts negatively influence the economic growth. This means that an increment in the procurement of domestic debt leads to an increment in the Nigeria economic growth but an increment in the domestic debt service payment leads to a decrease in the economic growth. That is when loans are borrowed internally, effort should be made to pay back the loan as soon as possible.

In a nutshell, Nigeria can resort to borrowing when short of revenue, but this borrowing should be made only from domestic sources and the repayment should be done as soon as the debt matures, that is the loan should be paid back within a short period of time so that it will not pose a threat to the economic growth of the nation.

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