

An Empirical Analysis of the Macroeconomic Impact of Public Debt in Nigeria

Sunday N. Essien, Ngozi .T. I. Agboegbulem, Michael K. Mba
and Ogochukwu G. Onumonu¹

This paper examines the impact of public sector borrowings on prices, interest rates, and output in Nigeria. It utilized a Vector Autoregressive framework, the Granger causality test, impulse response, and variance decomposition of the various innovations to study the impact. It found that shock to external debt stock increases prime lending rate, but with a lag. However, the level of external and domestic debt over the period of this study had no significant impact on the general price level and output.

Keywords: Public Debt, Output, Prices, Prime Lending Rate, Vector Autoregressive Model, Granger Causality

JEL Classification: C32, E23, E31, E43, H63

1.0 Introduction

Countries borrow when they are unable to generate enough domestic savings to carry out their productive activities. The funds borrowed are meant to boost economic growth and development of the country thereby improves the standard of living of the citizenry. Governments usually borrow by issuing securities, government bonds, and bills. Countries could also borrow directly from supranational organization such as the World Bank and international financial institutions.

In the early 1970s, developing countries borrowed to finance their current account deficit. Such borrowing was geared towards boosting the level of economic growth and development. As the debt piled up, the international financial institutions from the 1980s started providing both technical and financial debt-management assistance to debtor countries. This effort, which was still aimed at fostering economic growth, was equally meant to reduce both debt burdens and poverty level of these countries in order to make them more viable. While these measures succeeded in substantially reducing the

¹ Corresponding author: snessien@cbn.gov.ng. The authors are staff of Statistics Department, Central Bank of Nigeria. The views expressed in this paper are those of the authors and does not necessarily represent the position of the Bank

external debt burdens of many middle-income countries, a different scenario played out for many of their poor counterparts. On the other hand, not much attention was being paid to the domestic debt. Thus some countries, Nigeria inclusive, have been witnessing bloated domestic debt. Generally, debt burden of poor countries had continued to pile up coupled with chronic poverty and civil conflicts, culminating in sluggish economic growth.

In recent times there seems to be a consensus among public opinion leaders that huge external debt was adversely affecting economic growth and development in developing countries (Mojekwu and Ogege (2012)). This was affirmed by Reinhart and Rogoff (2010) who observed that ‘the relationship between government debt and real GDP growth is weak for debt/GDP ratios below a threshold of 90 percent of GDP’.

Nigeria incurred both domestic and external debts. The external debt is typically owed to foreign creditors. These are multilateral agencies such as the Africa Development Bank, the World Bank, or the Islamic Development Bank, and bilateral agencies such as the China Exim Bank, the French Development Bank, or the Japanese Aid Agency. There are also foreign private creditors such as investors in Nigeria’s Eurobonds. The domestic debt, however, is contracted within Nigerian borders, usually through bond and Treasury bills which are purchased by Nigerian banks, local pension funds, and other domestic and foreign investors. The government also has some contractor arrears, and other local liabilities which form part of total public debt. The concern is that excessive domestic borrowing could crowd out private sector investment as the government competes with the private sector for available funds.

The objectives of this paper are to assess the impact of public debt on key macroeconomic variables such as output, prices and interest rates in Nigeria. Thus, the paper would examine the implications of Nigeria’s rising public debt profile with a view to proffering policy recommendations.

The paper is structured into five sections. Following this introduction, section two gives an overview of Nigeria’s public debt. Section three undertakes a review of theoretical and empirical literature. Discussions on the methodology, model estimation, and empirical results are contained in section

four, while section five provides the policy implications of the analysis and concludes the paper.

2.0 Overview of Nigeria's Public Debt

Nigeria's indebtedness dates back to pre-independence era. The debts incurred before 1978 were relatively small and mainly long-term loans from multi-lateral and official sources such as the World Bank and Nigeria's major trading partners. The loans were majorly obtained on soft terms and therefore did not constitute a burden to the economy. However, due to the fall in oil prices and oil receipts, the country in 1977/78 raised the first jumbo loan to the tune of US\$1.0 billion from the international capital market. The loan was used to finance various medium to long-term infrastructural projects.

Domestic debt management in Nigeria had hitherto been carried out by the CBN through the issuance of government instruments, such as the Nigerian Treasury Bills (NTBs); Nigerian Treasury Certificates; Federal Government Development Stocks; and Treasury Bonds.

The debt management strategy adopted at that time led to inefficiencies resulting in fundamental challenges. In consideration of these numerous difficulties, the government established an autonomous debt management office in order to achieve efficient debt management practices. The Debt Management Office (DMO) was thus established on October 4, 2000 to centrally co-ordinate the management of Nigeria's debt for all the tiers of government. While the state governments' external borrowing is guaranteed by the Federal Government (FG), their domestic borrowings required analysis and confirmation by the FG based on clear criteria and guidelines that the states can repay based on their monthly allocations from the Federation Account Allocation Committee (FAAC) and internally generated revenue (IGR).

The past couple of decades have witnessed rising concern on the increase in Nigeria's public debt. The first most significant rise in Nigeria's public debt occurred in 1987 when the total debt rose by 96.9 per cent to ₦137.58 billion. From then, the rise in Nigeria's public debt continued unabated such that as at 2004, total public debt stood at ₦6,188.03 million.

In 1986, total debt which was hitherto driven largely by the domestic debt witnessed a reversal and was being driven by the external debt. Thus, the

dominance of the external debt as well as the steady rise in total debt remained till 2005 when the country was granted debt pardon by the Paris Club. The debt forgiveness saw Nigeria's total debt and external debt plummeting by 59.0 per cent and 90.8 per cent, respectively between 2004 and 2006 to ₦2,533.47 billion and ₦451.5 billion. Incidentally, as external debt shrunk, domestic debt continued to grow unabated such that by 2011, total debt which was being driven by the domestic debt had exceeded the 2004 level and stood at ₦6,519.65 billion. By 2012, Nigeria's total debt had hit an all-time high of ₦7,564.4 billion. Between 2006 and 2012, the domestic debt had accounted for 82.2 to 87.2 per cent of the total debt.

Current debates on fiscal consolidation emphasized the crucial role of prudential limits on public debt-to-GDP ratios. A debt-to-GDP ratio of 60 per cent is quite often noted as a prudential limit for developed countries, while for developing and emerging economies, a ratio of 30.0 per cent was maintained before 2008 and 40 per cent was being applied since 2009 (DMO, 2013). However, these ratios are not sacrosanct as countries are encouraged to adapt different strategies to achieve fiscal consolidation (IMF, 2011).

Nigeria's public debt was unsustainable between the periods of 1985-1995 and 1998-2004. While brief sustainability was enjoyed in 1996-1998, Nigeria's debt had been below the threshold since 2005. The sustainability of the former was due to astronomical increase in Gross Domestic Product (GDP) whereas that of the later could be attributable to both GDP growth and debt forgiveness. Though Nigeria's debt had remained sustainable since 2005, it is however noteworthy that both public debt and GDP had been on continuous rise. At 62.41 per cent, by end-2012 the bulk of Nigerian domestic debt was made up of Federal Government of Nigeria (FGN) bonds. This was followed by the treasury bills at 32.47 per cent.

Most of Nigeria's domestic debt which was mostly long-term in 2010 became more of short-term, that is, they had maturity of less than one year. This led to increased debt service burden. As at end-2012, the Nigerian total public debt service / GDP ratio stood at 0.5 per cent. With the debt forgiveness in 2005, Nigerian foreign debt which was hitherto being driven by Paris Club was being dominated by the multilateral debt.

The holding of the domestic debt which was mostly taken up by the CBN from 1981 to 2003 changed such that the Deposit Money Banks (DMBs) and the Non-Bank Public surpassed the CBN and became major players in the domestic debt market with the DMBs taking the lead.

3.0 Review of Literature

3.1 Theoretical Framework

The first step towards measuring the effect of government borrowing on the economy is to understand the mechanism through which it can affect key macroeconomic variables. Governments use fiscal policy to influence the level of aggregate demand in the economy in an effort to achieve economic objectives of price stability, full employment, and economic growth. Keynesian economics suggests that increasing government spending and decreasing tax rates are the best ways to stimulate aggregate demand. Keynesians argue that this method can be used in times of recession or low economic activity as an essential tool for building the framework for strong economic growth and working towards full employment. In theory, the resulting deficits would be paid for by an expanded economy during the boom that would follow.

Governments can use a budget surplus to do two things: to slow the pace of strong economic growth and to stabilize prices when inflation is too high. Keynesian theory posits that removing spending from the economy will reduce levels of aggregate demand and contract the economy, thus stabilizing prices.

The debate on the effectiveness of fiscal stimulus is still on-going. The argument mostly centers on crowding out: whether government borrowing leads to higher interest rates that may offset the stimulative impact of spending. When the government runs a budget deficit, funds will need to come from public borrowing, overseas borrowing, or monetizing the debt. When governments fund a deficit with the issuing of government bonds, interest rates can increase across the market, because government borrowing creates higher demand for credit in the financial markets (Frank and Bernanke, 2001). This causes a lower aggregate demand for goods and services, contrary to the objective of a fiscal stimulus. Neoclassical economists generally emphasize crowding out while Keynesians argue that

fiscal policy can still be effective especially in a liquidity trap where, they argue, crowding out is minimal.

Some classical and neoclassical economists argue that crowding out completely negates any fiscal stimulus; this is known as the Treasury View, which the Keynesian economists reject. The Treasury View refers to the theoretical positions of classical economists in the British Treasury, who opposed Keynes' call in the 1930s for fiscal stimulus. The same general argument has been repeated by some neoclassical economists up to the present.

In the classical view, the expansionary fiscal policy also decreases net exports, which has a mitigating effect on national output and income. When government borrowing increases interest rates it attracts foreign capital from foreign investors. This is because, all things being equal, the bonds issued from a country executing expansionary fiscal policy now offer a higher rate of return. In other words, companies wanting to finance projects must compete with their government for capital so they offer higher rates of return. To purchase bonds originating from a certain country, foreign investors must obtain that country's currency. Therefore, when foreign capital flows into the country undergoing fiscal expansion, demand for that country's currency increases. The increased demand causes that country's currency to appreciate. Once the currency appreciates, goods originating from that country now cost more to foreigners than they did before and foreign goods now cost less than they did before. Consequently, exports decrease and imports increase.

Other possible problems with fiscal stimulus include the time lag between the implementation of the policy and detectable effects in the economy, and inflationary effects driven by increased demand. In theory, fiscal stimulus does not cause inflation when it uses resources that would have otherwise been idle. For instance, if a fiscal stimulus employs a worker who otherwise would have been unemployed, there is no inflationary effect; however, if the stimulus employs a worker who otherwise would have had a job, the stimulus is increasing labor demand while labor supply remains fixed, leading to wage inflation and therefore price inflation.

3.2 Empirical Review

The issue of public debt and its relationship with macroeconomic variables has brought about an increasing literature regarding the determinants of public debt burden and its impact on the economy as well as the policy implications. Some of the empirical works reviewed in this section borders on analysis carried out between public debt and its impact on economic growth, prices (inflation), crowding out of private sector and interest rates.

A study by Ekperiware and Oladeji (2012) examined the effect of external debt relief on economic growth in Nigeria using regression technique on quarterly time series of external debt, external debt service and real gross domestic product. Applying Chow- test to the regression result they found that there was a structural break in the relationship between economic growth and external debt in Nigeria during the period 1975 to 2005. The study concluded that the external debt relief made more resources available for economic growth in Nigeria and recommended a shift towards discretionary concessional borrowing. It also identified external debt relief as a good option for poor unsustainable indebted countries as a way of making resources available for economic growth with the real sector being the focal point where value is created rather than impeding it with mismanagement and servicing debt.

Obademi (2012) used the ordinary least squares (OLS) technique in an augmented Cobb Douglas model in analyzing the impact of public debt on economic growth in Nigeria. The variables used were the external debt, domestic debt, total debt and budget deficit. He found that the impact of debt on economic growth was negative and quite significant in the long-run though in the short-run the impact was useful. He concluded that though the impact of borrowed funds on the Nigerian economy was positive in the short-run, its impact in the long-run depressed the economy as a result of inefficient debt management.

In another attempt to study the impact of external debt management on macroeconomic performance in Nigeria, Ezike and Mojekwu (2011) applied the OLS technique on real GDP, total external debt stock and debt service ratio. Their results revealed that foreign capital inflow was positive as expected while debt service/export ratio was negative as expected. This was because debt capital adds to capital formation and positively impacted on economic growth. On the other hand, debt-service ratio reflects capital outflow and

consequently deteriorates the performance of a country and thus reduces real GDP. It also confirms the theoretical expectations that debt service/export ratio diverts resources away from the debtor country. Since total debt stock depicts a positive relationship in the results instead of a negative relationship and statistically significant at all the levels, they therefore concluded that total debt stock, less debt service, still leaves a robust positive balance, to enhance capital accumulation that positively impacts economic growth.

Udoka and Ogege (2012) examined the extent of public debt crisis and its consequences on economic development using data on the Nigerian economy for the period 1970 to 2010. They employed the error correction modeling framework with co-integration techniques to test the relationship between per-capita GDP and other macroeconomic variables (foreign reserve, debt stock, investment, debt service payment). The test revealed that political instability may reduce the rate of development and other independent variables were responsible for the underdevelopment of the country. Hence, they recommended that, to avoid the crisis of economic development in Nigeria, public debt should be reduced to minimal level.

In an empirical investigation of the relationship between domestic debt and economic growth in Nigeria, Adofu and Abula (2010) using ordinary least square regression techniques explored the relationship between domestic debt and economic growth in Nigeria. The result showed that domestic debt affected the growth of the economy negatively. They recommended that government domestic borrowing should be discouraged and that increasing the revenue base through tax reform programmes should be encouraged.

To validate the belief that public sector borrowing spurs growth, Onyeiwu (2012) carried out an investigation on the relationship between domestic debt and economic growth in Nigeria using the error correction modeling approach to regression analysis. He used quarterly data between 1994 and 2008 for GDP, foreign exchange rate, credit to private sector, budget deficit and money supply. The result showed that the domestic debt holding of government was far above the healthy threshold of 35 percent of bank deposits, which resulted in a negative effect on economic growth. He recommended that government should maintain a debt-to-bank deposit ratio of below 35 percent, resort to increased use of tax revenue to finance its projects and divest itself of all

projects the private sector can handle while providing enabling environment for private sector investments such as tax holidays, subsidies, guarantees and most importantly improve infrastructure.

Faraglia et al (2012) examined the impact of government debt maturity on inflation using dynamic stochastic general equilibrium (DSGE) model. They used the following variables: Fiscal Insurance, Fiscal Sustainability, Government Debt, Inflation, Interest Rates and Maturity. The result showed that the persistence and volatility of inflation depends on the sign, size and maturity structure of government debt and remains significantly incomplete even with long bonds and inflation which plays a minor role in achieving debt sustainability. They concluded that issuing long term debt does enable governments to use inflation more to achieve fiscal sustainability. The longer the maturity of debt, the more volatile and persistent is inflation. However the relative impact on inflation is modest and the relative importance of inflation in achieving fiscal sustainability is modest whatever the length of maturity. A more substantial contribution to debt stabilization comes from twiggging interest rates.

Traum and Yang (2010) estimated the crowding out effects of government debt for the U.S. economy using a New Keynesian model which includes the following variables: real aggregate consumption, investment, labor, wages, nominal interest rate, gross inflation rate, and fiscal variables such as capital, labor, consumption tax revenues, real government consumption and investment, and transfers. The result of the estimates revealed that whether private investment is crowded in or out in the short term depends on the fiscal shock that triggers debt accumulation. Higher debt can crowd in investment despite a higher real interest rate for a reduction in capital tax rates or an increase in productive government investment. Distortionary financing to retire debt also showed that the degree of crowding out depends on the monetary authority's responses to inflation and output fluctuations.

In a cross-country study, Kalulumia (2002) analysed the impact of government debt on interest rates of United States, Germany, the United Kingdom and Canada using the Johansen error-correction model (ECM) and the general portfolio balance model. The variables used were exchange rate, real GDP, interest rate and stock of domestic assets. The evidence generally indicated the absence of causality in the long-run, between government debt and interest-rate related variables for all the four countries, which indicated

that government debt had no lasting positive effects on any of the variables of interest, such as interest rates, money demand and the exchange rate.

4.0 Methodology, Estimation, and Empirical Results

4.1 Data Description and Source

This paper used annual data for the period 1970 to 2014, which was primarily sourced from various editions of the Central Bank of Nigeria (CBN) Statistical Bulletin and Annual Report & Statement of Accounts.

To capture public debt in Nigeria, we used data on domestic debt stock and external debt stock, while real GDP was used to capture output. The general price level was captured using the average CPI for the various months in the year, while the prime lending rate was used as proxy for interest rates.

4.2 Estimation Framework

To achieve the core objective of this paper of analyzing the macroeconomic impact of public debt in Nigeria, this section adopted a Vector Autoregression (VAR) model to investigate the impact of public debt on the key macroeconomic variables. The VAR impulse response function and granger causality test were used to analyze the effects of public debt on output, prices and interest rates. The adoption of the VAR framework was informed by the main objective of the study.

According to Mordi (2013), a VAR model is an n-equation, n-variable linear model in which each variable is in turn explained by its own lagged values, (plus current, depending on the variant of the VAR) and past values of the remaining n-1 variables. It is a simple framework that provides a systematic way to capture rich dynamics in multiple time series, while its statistical toolkit is easy to use and interpret.

We start the analysis with a basic model which gives the combined impact of public debt on output, prices and interest rate. Our aim is to observe the interaction among the variables.

Our VAR model is of the form:

$$Z_t = \sum_{i=1}^k A_i Z_{t-i} + \mu_t \tag{1}$$

Where,

$$Z_t = \begin{pmatrix} g_t \\ LR_t \\ CPI_t \\ XD_t \\ DD_t \end{pmatrix}, \quad \mu_t = \begin{pmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \\ \mu_{5t} \end{pmatrix}$$

and

$A_i (i = 1, \dots, k)$ is a 5x5 matrix and k is the maximum lag length to be determined;

with

- g = real GDP
- LR = prime lending rate
- CPI = composite consumer price index
- XD = external debt stock
- DD = domestic debt stock
- μ = residual

Each of the variables in the VAR model depends on all the other variables, with exactly the same lag structure applied to each variable in all the equations. For the purpose of this study, no zero-restrictions were imposed, thus all the a_{ij} and b_{ij} parameters were non-zero.

5.0 Model Estimation and Empirical Findings

5.1 Descriptive Analysis of the Data

Table 1: Descriptive Statistics

	L_G	LR	L_CPI	L_XD	L_DD
Mean	12.68	15.16	1.60	11.22	11.61
Median	12.73	16.72	1.58	12.97	11.99
Maximum	13.81	31.65	5.10	15.40	15.88
Minimum	11.24	6.00	-2.30	5.16	6.91
Std. Dev.	0.64	6.54	2.52	3.41	2.84
Skewness	-0.36	0.16	-0.10	-0.61	-0.20
Kurtosis	2.84	2.23	1.48	1.86	1.78
Jarque-Bera	1.04	1.30	4.42	5.21	3.05
Probability	0.60	0.52	0.11	0.07	0.22
Sum	570.82	682.15	72.09	504.88	522.63
Sum Sq. Dev.	18.16	1879.71	279.27	512.77	353.89
Observations	45	45	45	45	45

In order to ascertain the distribution of the data being used for this analysis, some descriptive analyses were performed. First, logarithmic transformations were carried out for some of the variables such as external and domestic debt stock data. Table 1 shows the result of the descriptive analysis of the data. The Jarque-Bera test for normality shows that all the variables were normally distributed at 5% level of significance.

5.2 Unit Root Test

To test for the stationarity of the variables to ascertain their order of integration, the Augmented Dickey Fuller (ADF) and the Philip-Perron (P-P) tests were carried out on each of the variables.

The results of the ADF and P-P tests are shown Table 2. All the variables were found to be stationary at first difference.

The unit root test also considered whether the variables were intercept or trend stationary, the result indicated that all the other variables were found to be stationary with the intercept in both ADF and P-P tests. With this evidence that all the variables were of a higher order (I(1)), we proceeded with the VAR estimation for the system.

Table 2: Unit Root Test

ADF Test					
Variable	Level	1st Difference	Order of Integration	No. of Lags	Trend/Intercept
g	-1.377080*	-3.888631**	I(1)	1	Intercept
lr	-1.592822*	-5.861301**	I(1)	1	Intercept
cpi	-0.753207*	-3.402675**	I(1)	1	Intercept
xd	-1.791351*	-3.909374**	I(1)	1	Intercept
dd	-0.812984*	-4.573212**	I(1)	1	Intercept
P-P Test					
Variable	Level	1st Difference	Order of Integration	No. of Lags	Trend/Intercept
g	-1.611497*	-5.107314**	I(1)	1	Intercept
lr	-1.683086*	-7.582737**	I(1)	1	Intercept
cpi	-0.782797*	-4.429492**	I(1)	1	Intercept
xd	-1.709510*	-5.030440**	I(1)	1	Intercept
dd	-0.658642*	-5.037436**	I(1)	1	Intercept

* implies not significant at 5%

** implies significant at 5%

5.3 VAR Estimation

We estimated an unrestricted VAR equation using two (2) lag lengths. Then we proceeded to carry out some tests on the result such as optimal lag length selection, residual tests and stability test for the model.

The test for the optimal lag length shows that all the test criteria (SIC, LR, HQ, AIC, and FPE) selected one lag length. Further tests using higher lags did not yield any different result. Specifying lag lengths lower than five resulted in the test criteria selecting lag one as the optimal lag length. Due to the sample size of the data used for analysis, we adopted the selection made by all the test criteria of one-lag length for re-estimating the VAR equations (Table 3).

Table 3: Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-253.2339	NA	0.150697	12.29685	12.50372	12.37268
1	5.023799	442.7275*	2.28e-06*	1.189343*	2.430535*	1.644289*
2	23.48478	27.25193	3.28E-06	1.500725	3.776244	2.334793
3	40.57576	21.16026	5.51E-06	1.877345	5.187191	3.090534

** indicates lag order selected by the criterion*

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Using the lag length of $k = 1$, we re-estimated the VAR model and tested for the stability of the model.

The result of the stability test of the VAR model shows that none of the roots of the model lies outside the unit circle, which implies that our VAR equation satisfies the stability condition.

To further probe on the model, we used the autocorrelation LM test of the residuals which shows that there were no serial autocorrelation in the model. This confirmed the behavior of the residuals for each model as shown in the residual graphs.

For instance, apart from the spike in the residuals of the real GDP model in 1975 being outside the band, it was within the band for most of the period under consideration. For the prime lending rate, its model residuals operated within the band except for the period 1989 to 1994 which reflected the impact of the structural adjustment programme (SAP) implemented in Nigeria as an economic reform programme (Figure 1).

The residuals of the model for the composite consumer price index (CPI) exhibited fluctuations that were not far away from the band during the period under consideration. External debt model recorded major spikes in its residual outside the band in 1999 and 2006, with the later believed to be a result of Nigeria's exit from the Paris Club debt the previous year. The residuals of the model for domestic debt remained reasonably within the band though with several spikes occurring at various periods around the band. This reflected the fluctuating attitude of the Nigerian government in borrowing from the domestic market as it is usually more expensive than external borrowing in addition to its tendency to inflate prices and increase interest rates.

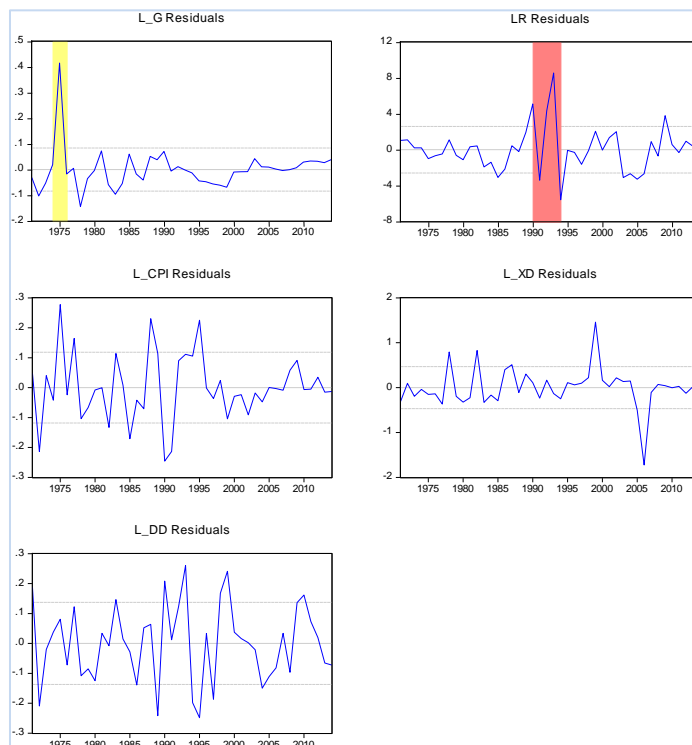


Figure 1: Residual Series of the VAR model

Granger Causality

Table 5 shows the results of the VAR Granger Causality/Block Exogeneity Wald Tests on the estimated VAR (5,1) model. The test showed that growth in real GDP was not Granger caused by the past values of either external or domestic debt.

Table 5: VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable: L_G				Chi-sq	df	Prob.	Dependent variable: L_XD				Chi-sq	df	Prob.
LR				0.0633	1	0.80	L_G				0.0380	1	0.85
L_CPI				2.1089	1	0.15	LR				0.0155	1	0.90
L_XD				0.1983	1	0.66	L_CPI				3.9679	1	0.05
L_DD				0.3015	1	0.58	L_DD				1.9927	1	0.16
All				4.2525	4	0.37	All				4.9619	4	0.29
Dependent variable: LR				Chi-sq	df	Prob.	Dependent variable: L_DD				Chi-sq	df	Prob.
L_G				0.1266	1	0.72	L_G				23.8771	1	0.00
L_CPI				0.2730	1	0.60	LR				0.6825	1	0.41
L_XD				10.8363	1	0.00	L_CPI				4.4037	1	0.04
L_DD				0.2319	1	0.63	L_XD				0.8216	1	0.36
All				12.2005	4	0.02	All				24.2139	4	0.00
Dependent variable: L_CPI				Chi-sq	df	Prob.							
L_G				0.3741	1	0.54							
LR				8.4110	1	0.00							
L_XD				0.0120	1	0.91							
L_DD				0.6510	1	0.42							
All				23.5686	4	0.00							

The current values of the prime lending rates was however, found to be influenced by previous year’s values of external debt while past values of real GDP and CPI did not influence current values of the prime lending rate.

Further analysis of the Wald test showed that the current values of the CPI was not influenced by the past values of the external debt nor the domestic debt in Nigeria but was influenced by the past values of the prime lending rate.

The result of the Wald test implies that any increase in the external debt for Nigeria would impact on lending rates which have buttressed the impact of external borrowing on the country’s credit market.

Impulse Response and Variance Decomposition

Using the Monte Carlo response standard errors, we carried out an impulse response analysis of real GDP, prime lending rate and inflation rate to innovations in external debt and domestic debt for periods of 5-years and 10-years. The impulse response graphs shown in Figure 2 indicated that for both the 5-year period and 10-year period, the real GDP did not respond to innovations from either the external debt or the domestic debt values.

The result on the other hand showed that the prime lending rate and CPI responded positively to shocks in innovations from the external debt but reacts negatively over the periods to shocks in innovations from the domestic debt. This confirmed the inflationary tendencies of increased public borrowing which increases government expenditure as well as the attendant changes in interest rates arising from the increase in credit to government which crowds out private borrowing.

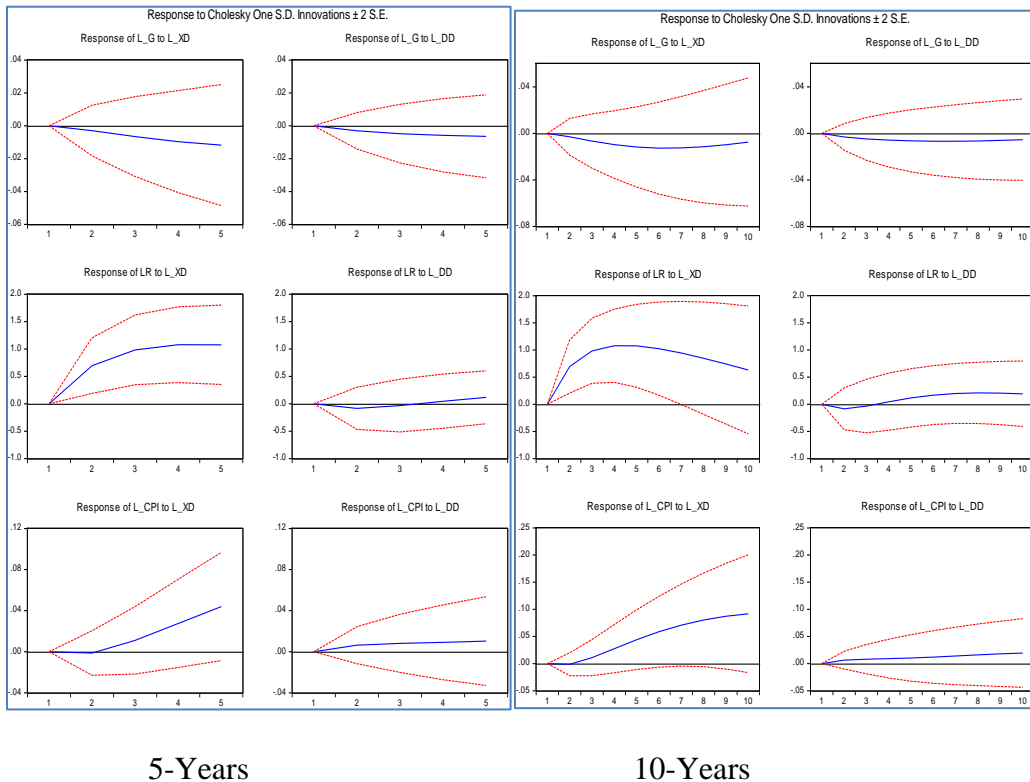


Figure 2: Monte Carlo Impulse Response

6.0 Policy Implications and Concluding Remarks

6.1 Policy Implications

The essence of public sector borrowing is to promote growth and development in an economy. However, when certain limits or thresholds are reached further borrowing may hamper growth and even development. This paper has analyzed the impact of public sector borrowing on some key macroeconomic variables in Nigeria. Following from our findings and analysis, we proffer the following policy recommendations.

Nigeria's debt has remained at a sustainable level since 2005 to date following effective debt management strategies adopted by the Debt Management Office (DMO). We therefore, recommend that current debt-to-GDP ratio of less than 20 percent should be sustained to ensure that the country's debt remains within the internationally recommended threshold for developing economies.

From the econometric analysis, the paper found that neither external nor domestic debt had any impact on economic growth in Nigeria during the period under consideration. This implies that most of the public borrowings carried out within this period were not growth-oriented. This could be explained by the fact that most of the borrowings prior to the year 2005 were mainly to finance trade deficits which were mainly consumable goods. Thus, we recommend that further public borrowing should be targeted at specified productive sectors of the economy that would engender growth in the long-run. This could be achieved through the procedure of tying every public borrowing to specific projects that are production-oriented.

Despite our finding that both external and domestic borrowing had no significant impact on the general price level in the economy, it was established that inflation responded positively to shocks in innovations from external debt and negatively to innovations from domestic debt. The outcome of both forms of borrowing on government expenditure, however, depends on whether such expenditure was deployed on the provision of capital goods or recurrent expenditures. Consequently, we recommend that government borrowing should not be used for purposes that could inflate the economy, such as recurrent expenditures, but should be channeled towards the provision

of basic infrastructure and goods that would increase the level of economic activities.

The various analyses carried out in the paper clearly showed that the prevailing level of interest rates (lending rates) in the economy is highly influenced by the level of public borrowing. This could be attributed to the crowding out effect of increased public borrowing which has the tendency of stifling available credit to the private sector borrowing and increasing the level of interest rates charged by banks. Thus, we encourage the sustenance of the current approach adopted by DMO of facilitating government borrowings from the long-term market, especially the issuing of domestic and foreign bonds which are traded at competitive market rates. Also, efforts should be geared at encouraging the sub-national governments to adopt this approach instead of borrowing from deposit money banks to the detriment of the private sector.

5.2 Concluding Remarks

The paper was targeted at establishing the impact of public debt on the Nigerian economy using some key macroeconomic variables such as GDP growth, headline inflation and prime lending rate. The paper revealed that while the level of external and domestic debts had no significant impact on economic growth and inflation, they influenced the level of interest rates prevailing in the economy within the study horizon.

The paper recommends that the current approach of borrowing from the long-term market by the government through the DMO should be sustained. There is also the need to encourage the adoption of the same approach by the lower tiers of governments. This will help in minimizing the crowding effect of government borrowing on the private sector.

References

Adofu, I. & Abula, M. (2010). Domestic Debt and the Nigerian Economy. *Current Research Journal of Economic Theory*, 2(1):22-26, January

Debt Management Office (DMO) (2013), www.dmo.gov.ng

-
- Ekperiware, M.C. & Oladeji, S.I. (2012). External Debt Relief and Economic Growth in Nigeria: 1975-2005. *American Journal of Economics* 2012, 2(7). August.
- Ezike, J.E. & Mojekwu, J.N. (2011). The Impact Of External Debt On Macro-Economic Performance. *International Journal of Business and Management Tomorrow*. 1(2).
- Faraglia, E., Marcet, A., Oikonomou, R. & Scott, A. (2012). *The Impact of Government Debt Maturity on Inflation*. Retrieved from www.iae.csic.es/investigadorsMaterial/a12204092343archivoPdf34286.pdf
- International Monetary Fund (IMF) (2011). *Public Sector Debt Statistics (PSDS): Guide for Compilers and Users*. Washington D.C., U.S.A.
- Kalulumia, P. (2002). Effects of Government Debt on Interest Rates: Evidence from Causality Tests in Johansen-Type Models. *Repec Econ Papers*. Retrieved from econpapers.repec.org/RePEc:shr:wpaper:02-07
- Mojekwu, J.N. & Ogege, S. (2012). Nigeria public debt and economic growth: a critical appraiser. *The Business & Management Review* 3(1), November
- Mordi, C.N.O. (2013). Multivariate Models – Vector Autoregression (VAR) Models. Lecture presented at the WAIFEM Course on Econometric Modeling, Forecasting and Analysis for staff of Central Bank of Nigeria. Lagos, November.
- Obademi, O.E. (2012). An Empirical Analysis of the Impact of Public Debt on Economic Growth: Evidence from Nigeria 1975-2005. *Canadian Social Science*. 8,(4).
- Onyeiwu, C. (2012). Domestic Debt and the Growth of Nigerian Economy. *Research Journal of Finance and Accounting*. 3(5). Retrieved from www.iiste.org

- Reinhart M.C. & Rogoff S.K. (2010). Growth in a Time of Debt. *National Bureau of Economic Research Working Paper 15639*
- Robert, F. & Bernanke, B. (2001). *Principles of Macroeconomics*. McGraw Hill/Irwin Publishers, New York.
- Traum, N. & Yang, S.S. (2010). Does Government Debt Crowd Out Investment? A Bayesian DSGE Approach. *Congressional Budget Office*, Washington, D.C. April.
- Udoka C.O. & Ogege, S. (2012). Public Debt and the Crisis of Development in Nigeria Econometric Investigation. *Asian Journal of Finance & Accounting*, 4(2) December. Retrieved from <http://www.cscanada.net/index.php/css/article/view/j.css.1923669720120804.350>