The Impact of Domestic Debt on Economic Growth of Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author DOO designed the study, managed the literature searches and wrote the first draft of the manuscript. Author MDB managed the econometric analysis of the study which enabled us to draw the recommendations and conclusion from the result findings. Both authors read and approved the final manuscript.

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ABSTRACT

This paper empirically examined the impact of domestic debt on economic growth of Nigeria for the period 1985-2014 using annual time series data on variables as gross domestic product, treasury bonds, development stocks, federal government of Nigeria bonds and interest rate, sourced from the Central Bank of Nigeria Statistical Bulletin, 2014. The study employed the Augmented Dickey-Fuller Unit Root test and the Vector Autoregression method of analysis. The findings of the multivariate Vector Autoregression model revealed that domestic debt plays an important role in the growth process of Nigerian economy judging from the high R^2 (0.983616) and the statistically significant F-value (102.0618) of the gross domestic product regression. The variance decomposition analysis revealed that federal government of Nigeria bonds exert more pressure on the growth rate of gross domestic product in Nigeria. This was followed by shocks received from treasury bonds, while development stocks and interest rate contributed the least to shocks in gross domestic product. The findings of the impulse response function in support of the variance decomposition analysis showed that economic growth responded positively to shocks in federal government of Nigeria bonds and negatively to shocks in treasury bonds throughout the ten year period. Meanwhile, the response of gross domestic product to shocks in development stocks and

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interest rate was unstable. The study therefore recommended that government should resort to acquiring funds majorly through federal government of Nigeria bonds since the federal government of Nigeria bonds have a highly significant positive impact on economic growth.

ABBREVIATIONS

GDP : Gross Domestic Product
TRB : Treasury Bonds
DVS : Development Stock
FGNB : Federal Government of Nigeria Bonds
INTR : Interest Rate
VAR : Vector Auto Regression

1. INTRODUCTION

Due to the uneven distribution of natural resources that created scarcity, securing internal or external debt becomes inevitable for any government when the economy faces financial crisis as sustainable economic growth is a major concern for any sovereign nation, most especially the Less Developed Countries (LDCs) which are characterized by low capital formation due to low levels of domestic savings and investment [1]. Particularly, Nigeria's domestic borrowing is aimed at escaping the dangers associated with external borrowings occasioned by rising government expenditures in relation to falling government revenues; supplement the internal savings for productive activities through infrastructural development as well as management of other macroeconomic conditions of the country [2,3,4]. The ratio of domestic government debt to gross domestic product (GDP) in Nigeria, increased from 13.38 per cent in 2000 to 14.96 per cent in 2002, fell to 9.44 per cent in 2006 and increased again to 13.02 per cent in 2009. The level of domestic debt was 15.03 per cent of GDP in 2011, two years later (by 2013), this ratio went up slightly to 16.12 per cent of GDP. But by 2014, the domestic debt/GDP ratio was over 17 per cent [5]. Nigeria has not been alone in experiencing escalating levels of government domestic indebtedness, but in comparison to other countries in Sub-Sahara Africa, Nigeria's domestic debt to GDP ratio is clearly on the high side [6]. The outstanding level of government domestic debt has grown tremendously from N28.4 billion in 1986 to N477.7 billion in 1995, reduced in 1996 and started rising again in 1997. Domestic debt stock fell significantly from N4.13 trillion in 2007 to N2.32 trillion in 2008. It increased to N5.62 trillion in 2011 and was at N7.9 trillion as at end of December 2014. Annual average output growth increased to 14.5% in 2000-2003, 21% in 2004-2007, 37.8% in 2008 -2011 and fell to 15.8% in 2012-2014 [5].

It is usually expected that as countries expand their output, they also tend to rely more heavily on domestic public debt issuance to finance growth. Public expenditure as a per centage of GDP increased between the period 1995-1999 from 11.9% to 12.6% in the 2000–2004 periods, down to 12.4% in 2005-2009 and to 6.6% in 2010-2014. In the year 2013, the Federal Government proposed to spend N543 billion on domestic debt servicing out of N592 billion total debt service cost, yet domestic debt stock has increased to approximately N7.9 trillion as at the end of 2014 [5]. Domestic debt profile has been rising astronomically and if not controlled the resultant effect of the debt quagmire in Nigeria could create some unfavourable circumstances such as crowding out of private investment, poor GDP growth, etc [7].

In spite of her continued penchant for domestic loans, Nigerian economy is still characterized by low per capita income, high unemployment rates, dwindling economy, inadequate basic amenities and poor infrastructural development and falling growth rates of GDP. The reliance by the federal government on borrowing from the banking system, particularly the CBN, to finance its large and unsustainable fiscal deficits has affected the growth of the Nigerian economy negatively. This has hindered the attainment of macroeconomic stability and sustainable economic growth in Nigeria. In addition, it has crowded out the private sector from the credit market, thereby stalling investment and output growth [8,9,4].

It is against this backdrop that this study assessed the impact of domestic debt specifically procured through the long term debt instruments as; treasury bonds, development stocks and FGN bonds, on economic growth of Nigeria. This paper is organized into five sections: section one comprises the introductory background of the

study, statement of problems and objective. Section two covers the literature review and theoretical framework. Section three gives information about the research methodology while section four deals with presentation, interpretation and discussion of results. Section five covers the summary of findings, recommendations and conclusions.

2. LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Economic growth

Economic growth is defined as the process whereby the real per capita income of a country increases over a long period of time. It is measured by the increase in the amount of goods and services produced in a country at a particular period of time [10]. [11] perceived economic growth as the increase overtime in a country's real output of goods and services. However, for the purpose of this study, economic growth of Nigeria means an increase in the country's Gross Domestic Product over a period of time usually one fiscal year.

2.1.2 Domestic debt

[12] defined domestic debt as the gross liability of Government, and properly considered should include Federal, State and Local governments transfer obligations to the citizens and corporate firms within the country. Consequently, the Central Bank of Nigeria (CBN) as banker and financial adviser to the Federal Government is charged with the responsibility for managing the domestic Public debt. Domestic debts are debt instruments issued by the federal government and denominated in local currency. State and local government can also issue debt instruments, but debt instrument currently in issue consists of Nigerian treasury bills, federal government development stocks treasury bonds and federal government bonds [6]. Domestic Debts are debts that originate from within the geographical region of a country, which are contracted through debt instruments such as treasury bills, treasury certificates and treasury bonds. Others are development stocks, FGN bonds and Promissory notes.

In Nigeria, several factors have been advanced to explain the changing domestic debt profile between the 1960s and now. The major factor include: high budget deficits, low output growth, large expenditure growth, high inflation rate and narrow revenue base witnessed since the 1980s [12,13].

[14] while explaining the reasons for increasing public debt on the part of government came up with the following reasons; (1) Government borrows to finance emergencies such as natural disasters and economic depression, (2) Government borrows to finance important capital projects such as water dams, agricultural development projects, and river basin development projects and, (3) Government borrows to finance current expenditure in anticipation of reasonable revenue collection.

Generally, declines in government revenue were met by borrowing from the Central Bank through the instrument of ways and means advances. These advances were never defrayed by the federal government but refinanced by the floatation of new treasury bills and treasury bonds to pay holders of maturing debt instruments thereby contributing to the continued growth of the debt stock [4]. Currently, the unabated security challenges (like the Book Haram insurgency) and the high level of corruption of the country's political leaders have contributed to the increased accumulation of domestic debt of the federal government.

2.2 Theoretical Literature Review

2.2.1 The Neoclassical theory

According to the Neoclassical growth theory, debt has a direct effect on economic growth. This is because the amount borrowed, if used optimally, is anticipated to increase investment. As long as countries use the borrowed funds for productive investment and do not suffer from macroeconomic instability, policies that distort economic incentives or sizable adverse shocks, growth should increase and allow for timely debt repayment.

On the other hand, the indirect effect of debts is its effect on investment. The transmission mechanism through which debts affect growth is its reduction on the resources available for investment by debt servicing. Also, public debt can act as an implicit tax on the resources generated by a country and create a burden on future generations which come in the form of a reduced flow of income from a lower stock of private capital. This in turn, may lead to an increase in long-term interest rates, a crowding

out of private investments necessary for productivity growth, and a reduction in capital accumulation.

2.2.2 Ricardian equivalence proposition

In the Ricardian view, government debt is considered equivalent to future taxes. According to the Ricardian equivalence proposition, consumers are forward looking and so internalize the government's budget constraint when making their consumption decisions. So a debt-financed tax cut does not produce aggregate wealth effects. The increase in government debt does not affect consumption and hence, it does not change aggregate demand. The rational consumer facing current deficits saves for future rise in taxes and consequently total savings in the economy are not affected. A decrease in government dis-saving is matched by increase in private savings. In view of unchanged total savings, investment and interest rates are also unaffected and so is the national income. This theorem is used as an argument against tax cuts and spending increases aimed to boost aggregate demand.

2.2.3 The Keynesian theory

The Keynes view fiscal policy as the best policy that brings about growth in any economy since it acts in the interest of the general public. According to Keynes, when the government embark on domestic borrowing to finance its expenditure, unemployed funds are withdrawn from the private pockets and as such the consumption level of the private individuals is unaffected. This funds when injected back into the economy by the government leads to a multiple increase in aggregate demand causing an increase in output and employment. Hence, public domestic borrowing can be used to influence macroeconomic performance of the economy. On the other hand, the indirect effect of domestic borrowing is its effect on investment. The transmission mechanism through which domestic borrowing affects growth is its reduction in the amount of loanable funds, which puts an upward pressure on the rate of interest. With the assumption that investment is a function of interest rate and the relationship is negative, a higher rate of interest crowds out (reduce) private investment. This reduction in private investment has been called the partial crowding out of deficit financing. It is partial because the amount of crowding out of private investment is less than the amount of government debt issue. The

reduction in private investment results to a fall in aggregate demand, output and employment [10].

2.2.4 Traditional view

In the traditional view, a tax cut financed by government borrowing would have many effects on the economy. The immediate impact of the tax cut would be to motivate consumer spending as consumers respond to their higher after-tax income by spending more. Higher consumer spending affects the economy in both short-run and long-run. A government deficit expands aggregate demand and stimulates output in the short-run but crowds out capital and depresses investment in the long-run. The lower investment eventually leads to a lower steady state capital stock and a lower level of output. Therefore, the overall impact when considering the long-run period would be smaller total output and eventually lower consumption and reduced economic welfare. This is also referred to as the burden of public debt, as each generation burdens the next, by leaving behind a smaller aggregate stock of capital.

2.3 Empirical Literature Review

[15] investigated the empirical issues pertaining to the structure and composition of domestic debt and its impact on private investment in Nigeria. The study employed multiple regression models using secondary data from 1970 to 2012. The study found that domestic debt has a significant negative impact on domestic private investment in Nigeria. Results also showed that domestic debt has a significant negative impact on foreign private investment in Nigeria with exchange rate and debt servicing having positive effect on foreign private investment in Nigeria. The study concluded that domestic debt if unchecked crowds-out private investment in Nigeria.

[8] examined the impact of the different components of domestic debt on economic growth of Nigeria using multiple regression technique, and discovered that in the short-run, FGN Bond proved to have a positive significant relationship with economic growth, while development stock maintained a significant negative relationship. In the long-run, Treasury Bills and the lagged value of GDP variables were positively significant.

[16] asserted that domestic debts if properly managed can lead to high growth levels. A major policy implication of the result is that concerted

effort be made by policy makers to manage debts effectively by channelling them to productive activities (real sector), so as to increase the level of output in Nigeria. Another policy implication of the study was 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 paper also recommended that government should rely more on domestic debt in stimulating growth rather than external debt.

[17] investigated the relationship between domestic debt and the rate of poverty in Nigeria (1986-2012). Using Johansen Co-integration technique, estimated results revealed that a long-run relationship exist between poverty (measured by Gross Domestic Product, per capita gross domestic product, and basic secondary school enrolment) and domestic debt in Nigeria. The study equally revealed that the domestic debt has positive impact on bank credit and the impact is highly significant. Hence, the study recommended that government should make efforts to settle the outstanding domestic debt as it will give room for proper conduct of monetary policy in the economy. This is necessary because excessive domestic debt sometimes have negative effect on growth, if it persists.

[18] examined the relationship between government domestic debt and economic growth of Nigeria using unit root and co-integration test. Findings of the study showed that domestic debt and credit have significant and direct relationships with GDP, while debt servicing has an inverse relationship with GDP, and also government expenditure has a direct but insignificant relationship with GDP. The study, based on its findings, concluded that domestic debt should be invested in productive sector of the economy and more specifically in the real sector, and further productivity gain will be achieved in the improvement on capital project expenditure.

[9] examined the relationship between domestic debt and economic growth in Nigeria using Ordinary Least Squares Method (OLS), Error Correction and parsimonious models to analyze quarterly data between 1994 and 2008. Result of the study indicated that domestic debt holding of government is far above a healthy threshold of 35 per cent of bank deposit; this portends a crowding out effect on private investments. The study affirmed that the level of debt has negative

effect on economic growth in Nigeria. The study recommended that government should maintain a debt-bank deposit ratio below 35 per cent, increase its usage of tax revenue to finance developmental projects and to divest itself of all projects the private sector can handle, while providing enabling environment for private sector investors and most importantly improved infrastructural facilities.

[4] investigated the empirical relationship between domestic debt and economic growth in Nigeria. Using OLS regression technique with time series data spanning 1986–2005, the study explored the relationship between domestic debt and economic growth in Nigeria. The study revealed that the factors responsible for rising domestic debt in Nigeria are high budget deficit, low output level, increased government expenditures, high inflation rate and narrow revenue base. The analysis showed that domestic debt has affected the growth of the economy negatively, and recommended that government domestic borrowing should be discouraged and that increasing the revenue base through its tax reform programmes should be encouraged.

[19] investigated the impact of domestic debt on economic growth in Pakistan applying the OLS technique for the period of 1972 to 2009. The study indicated that the stock of domestic debt affects economic growth positively in Pakistan. The study also observed that there is an inverse relationship between domestic debt servicing and economic growth. The findings of the study revealed that the negative impact of domestic debt servicing on economic growth is stronger than positive impact of domestic debt on economic growth. The study therefore suggested economic policies to settle outstanding domestic debt.

[20] analyzed the economic impact of domestic debt on Kenya's economy applying ordinary least square technique using annual data over the period 1996 to 2007. The study found that domestic debt does not crowd out private sector lending in Kenya during the period due to substantial level of financial development in Kenya. The study also examined the effect of domestic debt on real output by using a modified Barro growth regression model. The results indicated that increase in domestic debt has a positive but insignificant effect on economic growth during the period. The study suggested that the government should employ wider reforms

that promote investment in treasury bonds and encourage institutional investors.

[6] employed a more comprehensive technique in investigating the effect of domestic debt on economic growth and concluded that domestic government debt in Nigeria has continued to suffer from confidence crises as market participants have consistently shown greater unwillingness to hold longer maturity debts and the government has only been able to issue more of short term debt instrument.

[21] analyzed the growth effects of the current domestic debt outstanding as a ratio of GDP and the growth effects of the past domestic debt accumulation, using Nigerian time series data for the period, 1970-2003. The results showed that current domestic debt outstanding as a ratio of GDP has a significant negative effect on economic growth, due largely to high implicit domestic interest rates. On the other hand, past domestic debt accumulated positively and significantly affects economic growth, thus rejecting the domestic debt overhang hypothesis. The study recommended the need for Nigeria to open and improve foreign access to holdings of domestic debts so as to strengthen competition and hence reduce financial costs with the accompanying introduction of financial technology and innovation that will in turn result in higher market efficiency.

Most of the reviewed studies on the matter like; [4,6,9,16,17,18,21], did not take into consideration the individual effects of the various domestic debt components on economic growth. Also, none of the reviewed studies employed the VAR method in their analysis. This study aimed at making a broad analysis of domestic debt and its various components effect, specifically the long-term debt instruments such as treasury bonds, development stocks and FGN bonds, on economic growth of Nigeria using the VAR approach and would add to existing knowledge on the view of domestic debt and economic growth of Nigeria.

2.4 Theoretical Framework

One of the most important macroeconomic objectives of every sovereign nation is to improve the standard of living of its citizenry and to promote her economic well being. Sustainable economic growth requires a given level of capital and investment and in a case where it is not sufficient, government results in issuance of domestic debt instruments to raise capital for its investment purposes and thereby, increase the growth rate of the economy.

This study adopted the Keynesian theory of public borrowing. According to Keynes, when the government increases its expenditure by borrowing from within the economy, total expenditure would increase. This leads to a multiple increases in output and hence employment. This according to Keynes is the multiplier effect of government expenditure.

$$Y = C + I + G \qquad (2.1)$$

Where Y = Total output, C = Consumption, I = Investment (or Domestic Capital formation), G = Government Expenditure. The change in output will be equal to the multiplier times the change in government expenditure.

$$\Delta Y = \frac{1\ (\Delta G)}{1\text{-}b} \qquad (2.2)$$

$$\text{Where} = \frac{1}{1\text{-}b} = K$$

$$\Delta Y = K\Delta G$$

$$\frac{\Delta Y}{\Delta G} = K \qquad (2.3)$$

Therefore change in output all over change in government expenditure is equal to the multiplier. Hence, domestic borrowing can be used to influence macroeconomic performance and also influence the output of the real sectors of the economy. On the other hand, the indirect effect of domestic borrowing is its effect on investment. The transmission mechanism through which domestic borrowing affects growth is its reduction in the amount of loanable funds, which puts an upward pressure on the rate of interest. With the assumption that investment is a function of interest rate and the relationship is negative, a higher rate of interest crowds out (reduce) private investment. This reduction in private investment has been called the partial crowding out of deficit financing. It is partial because the amount of crowding out of private investment is less than the amount of government debt issue. The reduction in private investment results to a fall in aggregate demand, output and employment [10].

3. METHODOLOGY

3.1 Model Specification

This study modified the empirical work of [8] to capture the impact of domestic debt on economic growth in Nigeria. A multiple regression model is used with economic growth proxied with Gross Domestic Product (GDP) as dependent variable, while treasury bonds, development stocks, FGN bonds and interest rate in the economy during the period of the study were treated as independent variables. GDP is used to capture economic growth in this study because it reflects the total output of goods and services produced in the economy at a particular time period. Treasury Bonds (TRB), Development Stock (DVS) and FGN Bonds (FGNB) are considered to be the major long-term components of domestic loans in Nigeria, while interest rate (INTR) is the rate of interest charged on borrowing in the economy at the particular period of time.

The functional form of the model is:

$$GDP = f\,(TRB, DVS, FGNB, INTR) \qquad (3.1)$$

Where:

GDP = Gross Domestic Product
TRB = Treasury Bonds
DVS= Development Stock
FGNB = Federal Government of Nigeria Bonds
INTR = Interest Rate

The stochastic model is:

$$GDP = \beta_0 + \beta_1 TRB + \beta_2 DVS + \beta_3 FGNB + \beta_4 INTR + \mu \qquad (3.2)$$

Where β_0 is the constant term, β_1, β_2, β_3 and β_4 are coefficients to be estimated and μ is the error term.

Our apriori expectations are: β_1, β_2 and $\beta_3 > 0$, and $\beta_4 < 0$.

3.2 Model Estimation Method

The specification and estimation of the model requires that we test the time series properties of the data to determine whether or not the variables contain integrated components, hence the Augmented Dickey Fuller (ADF) test was used to establish the stationarity (presence of a unit root) of the variables and to what degree. After testing for the stationarity of the variables, a multivariate Vector Autoregression (VAR) (Impulse response functions and Variance Decompositions) model was employed to determine how much of the variation in economic growth is determined by variations in treasury bonds, development stocks, FGN bonds and interest rate. The VAR model assumes all variables are endogenous and analyze a simultaneity relationship among the variables, such that the direction of causality and exogeneity is clearly shown by the result [22].

3.3 Nature and Sources of Data

This study examined the impact of domestic debt on economic growth in Nigeria for the period 1985 to 2014. This study used secondary type of time series data for the variables, gross domestic product, treasury bonds, development stocks, FGN bonds and interest rate, obtained from the Statistical Bulletin, and Annual Report and Statement of Accounts (various issues) of the Central Bank of Nigeria [5].

4. RESULT PRESENTATION AND ANALYSIS

4.1 Analysis of Data

4.1.1 Descriptive analysis

The descriptive analysis contains the measures of central tendency which include mean, mode, median as well as measures of variation and other statistical characteristics of the variables.

Mean is the average value of the series which is gotten by dividing the total value of the series by the number of observations. From Table 1 we see that the mean for GDP, TRB, DVS, FGNB and INTR are 17646.12, 246.4943, 2.301667, 839.4583 and 13.59800 respectively.

Median is the middle value of the series when the values are arranged in an ascending order. From the table (Table 1) the median for GDP, TRB, DVS, FGNB and INTR are 5696.393, 305.8050, 2.275000, 0.000000 and 13.50000 respectively.

Maximum and minimum are the maximum and minimum values of the series in the current sample. The maximum and minimum values for GDP, TRB, DVS, FGNB and INTR are 89043.62 & 134.5900, 430.6100 & 0.000000, 4.910000 & 0.000000, 4792.280 & 0.000000 and 26.00000 & 6.130000 respectively.

Table 1. Summary statistics

	GDP	TRB	DVS	FGNB	INTR
Mean	17646.12	246.4943	2.301667	839.4583	13.59800
Median	5696.393	305.8050	2.275000	0.000000	13.50000
Maximum	89043.62	430.6100	4.910000	4792.280	26.00000
Minimum	134.5900	0.000000	0.000000	0.000000	6.130000
Std. Dev.	26096.98	172.9473	1.719084	1498.761	3.983021
Skewness	1.662918	-0.339895	0.089925	1.593399	0.804966
Kurtosis	4.376818	1.470524	1.574799	4.017372	4.582927
Jarque-Bera	16.19602	3.501762	2.579430	13.98840	6.371922
Probability	0.000304	0.173621	0.275349	0.000917	0.041339
Sum	529383.7	7394.830	69.05000	25183.75	407.9400
Sum Sq. Dev.	1.98E+10	867411.8	85.70222	65142236	460.0693
Observations	30	30	30	30	30

Source: Author's Computation from E-views 7.1

Standard Deviation is a measure of spread or dispersion in the series. From Table 1 the standard deviation for GDP, TRB, DVS, FGNB and INTR are 26096.98, 172.9473, 1.719084, 1498.761and 3.983021 respectively.

Skewness is a measure of asymmetry of the distribution of the series around its mean. The skewness of a normal distribution is zero. Positive Skewness implies that the distribution has a long right tail and negative Skewness implies that the distribution has a long left tail. From the above table (Table 1) we observe that only TRB has a negative Skewness and as such, TRB has a long-left tail, whereas GDP, DVS, FGNB and INTR have positive Skewness therefore they have long-right tails.

Kurtosis measures the peakedness or flatness of the distribution of the series. If the Kurtosis is above three, the distribution is peaked or leptokurtic relative to the normal and if the Kurtosis is less than three (3), the distribution is flat or platykurtic relative to normal. From Table 1 only GDP, FGNB and INTR exceeds three, therefore they are peaked or leptokurtic, while TRB and DVS are below three, therefore they are flat or platykurtic.

Jarque-bera is a test statistic to test for normal distribution of the series. It thus follows that series will be normally distributed at 5% level of significance if the probability of J-B statistic is greater than 0.05. It was observed from the above normality test with reference to the Jarque-Bera estimates and their probability values that GDP, FGNB and INTR are not normally distributed as their probability values of 0.000304, 0.000917 and 0.041339 respectively were less than the 0.05 level of significance. On the other hand, it was observed TRB and DVS are normally distributed as their probability values of 0.173621 and 0.275349 respectively are greater than the 0.05 level of significance.

4.1.2 The unit root test results

The test result of the Augmented Dickey-Fuller statistic for all the time series variables used in the estimation are presented in Table 2.

The results of the ADF test statistics show that the five variables viz; GDP, TRB, DVS, FGNB and INTR were not stationary in their level form. However, GDP, TRB, DVS and INTR became stationary after the first difference while FGNB became stationary after the second difference. The implication of these results is that the lengths of sustained shock are not the same among the variables. Variables integrated of order two will exhibit a more persistent shock than the variables integrated of order one. Simply put, any shock received by such variables will take a very long period before the effect disappears. These results do not favour the required necessary condition for co-integration; therefore a condition for the better alternative, the Vector Autoregression (VAR) was met. The results of the VAR are discussed in subsequent sections.

4.2 Vector Autoregression Analysis

The major objective under this analysis is to determine the impact of domestic debt on economic growth of Nigeria. The short-run dynamics of the relationship between the components of domestic debt and economic growth was estimated using VAR model. The VAR was estimated in the multivariate form based on 2 lags.

Table 2. Test for stationarity

Variable	ADF statistic first difference	Critical value at 5%	ADF statistic second difference	Critical value at 5%	Order of integration
GDP	-3.706893	-2.971853			1(1)
TRB	-4.902888	-2.971853			1(1)
DVS	-5.558494	-2.971853			1(1)
FGNB	-1.526368	-2.971853	-5.802500	-2.976263	1(2)
INTR	-6.769210	-2.971853			1(1)

Source: Author's Computation from Unit Root Test (ADF)

Table 3. Vector autoregression estimates

Vector Autoregression Estimates
Date: 04/18/16   Time: 16:42
Sample(adjusted): 1987 2014
Included observations: 28 after adjusting endpoints
Standard errors in ( ) & t-statistics in [ ]

|	GDP	TRBD	DVS	FGNB	INTR
GDP(-1)	0.091776	0.000546	4.38E-06	-0.014511	0.000143
	(0.28941)	(0.00390)	(5.7E-06)	(0.01117)	(0.00021)
	[0.31712]	[0.14009]	[0.76323]	[-1.29889]	[0.67697]
GDP(-2)	-0.085910	-0.002502	9.44E-06	-0.009515	0.000140
	(0.33740)	(0.00454)	(6.7E-06)	(0.01302)	(0.00025)
	[-0.25462]	[-0.55064]	[1.40985]	[-0.73053]	[0.56657]
TRBD(-1)	6.088190	0.546838	-0.000174	-0.542679	-0.012529
	(18.3352)	(0.24696)	(0.00036)	(0.70777)	(0.01339)
	[0.33205]	[2.21430]	[-0.47951]	[-0.76675]	[-0.93585]
TRBD(-2)	9.881947	-0.302288	6.32E-05	-0.235272	0.008201
	(20.2438)	(0.27266)	(0.00040)	(0.78144)	(0.01478)
	[0.48815]	[-1.10865]	[0.15742]	[-0.30107]	[0.55480]
DVS(-1)	2828.299	-112.6936	1.230044	-209.3376	-9.688391
	(7483.42)	(100.795)	(0.14849)	(288.872)	(5.46413)
	[0.37794]	[-1.11805]	[8.28368]	[-0.72467]	[-1.77309]
DVS(-2)	-3651.781	8.517455	-0.206223	-11.15797	11.11639
	(7454.22)	(100.401)	(0.14791)	(287.745)	(5.44281)
	[-0.48989]	[0.08483]	[-1.39424]	[-0.03878]	[2.04240]
FGNB(-1)	16.66829	-0.144338	-9.34E-05	1.257692	-0.008376
	(8.05444)	(0.10849)	(0.00016)	(0.31091)	(0.00588)
	[2.06945]	[-1.33049]	[-0.58458]	[4.04514]	[-1.42424]
FGNB(-2)	1.497657	0.118178	-8.52E-05	0.086520	0.004681
	(10.2956)	(0.13867)	(0.00020)	(0.39743)	(0.00752)
	[0.14547]	[0.85221]	[-0.41718]	[0.21770]	[0.62272]
INTR(-1)	39.54417	2.995876	-0.012057	-8.762906	0.097711
	(330.806)	(4.45564)	(0.00656)	(12.7696)	(0.24154)
	[0.11954]	[0.67238]	[-1.83682]	[-0.68623]	[0.40453]
INTR(-2)	184.1295	-3.657240	-0.002010	-5.162821	-0.244392
	(311.859)	(4.20044)	(0.00619)	(12.0383)	(0.22771)
	[0.59043]	[-0.87068]	[-0.32485]	[-0.42887]	[-1.07327]
C	1023.342	507.5285	-0.045970	1181.184	11.37924
	(15550.4)	(209.449)	(0.30856)	(600.270)	(11.3543)
	[0.06581]	[2.42316]	[-0.14898]	[1.96775]	[1.00219]
R-squared	0.983616	0.923020	0.998349	0.992675	0.614235
Adj. R-squared	0.973979	0.877738	0.997378	0.988366	0.387315
Sum sq. Resids	3.13E+08	56750.32	0.123165	466128.5	166.7772
S.E. equation	4289.661	57.77763	0.085118	165.5878	3.132159
F-statistic	102.0618	20.38379	1028.042	230.3706	2.706831
Log likelihood	-266.9354	-146.3292	36.23977	-175.8104	-64.71264

Source: Author's Computation from E-views 7.1

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The results in Table 4 indicate that most of the lags of the variables are not significant. This is expected possibly because of multicolinearity [22]. Though an examination of the GDP regression indicates that individually, most lags of the variables are not significant, the R^2 (0.983616) and F value (102.0618) are so high that we cannot reject the hypothesis that collectively all the lagged terms are statistically significant.

4.2.1 Shock transmission among economic growth, treasury bonds, development stocks, FGN bonds and interest rate

The next analysis is the short-run shock transmission among the variables. This analysis was done using the variance decomposition and impulse response which are measures of short-run dynamics of the VAR. The results are presented in Tables 4 and 5 respectively.

The variance decomposition in Table 4 analyzes the decomposition of the shocks received by GDP to its constituent sources. It is another way of describing the causes and sources of variations or shocks to the variable, GDP. The 30 years period under study is summarized into a ten year period.

The largest contribution to shocks in economic growth (GDP) was a feedback shock from its own lag. The contribution of FGNB to shocks in GDP was the second largest, contributing about 33% shock to GDP for the first three year period and over 51% shock to GDP for the ten year period. This was followed by shocks received from TRB to GDP, contributing about 3% shock to GDP for the first three year period and about 37% shock to GDP for the ten year period, while DVS and INTR contributed the least to shocks in GDP of less than 1% for the first three year period and less than 3% for the ten year period. This is also shown in Fig. 1.
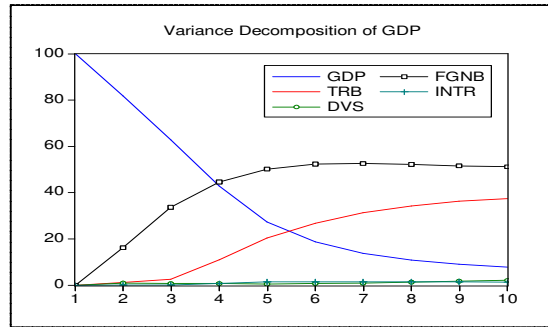
Fig. 1. Variance Decomposition of Economic Growth (GDP)
Source: Author's Computation from E-views 7.1

Impulse response function is another method of analyzing the short-run dynamics of relationships among a set of endogenous variables. It measures the response of a particular endogenous variable to one standard deviation shock or innovation to other endogenous variables. It is another way of describing how a particular variable does respond to shocks in other variables. Table 5 presents the Impulse Response analysis of the variables.

It is revealed that GDP responded positively to shocks in FGNB and negatively to shocks in TRB throughout the ten year period. Meanwhile, the response of GDP to shocks in DVS and INTR was unstable as they were positive for the first three periods but became negative the rest periods. This trend is also depicted in Fig. 2.

4.3 Policy Implication of the Findings

The implication of the findings of the VAR model is that there exists a significant long-run relationship between treasury bonds, development stocks, FGN bonds, interest rate and economic growth in Nigeria. The result of the multivariate VAR model indicated that most of

Table 4. Variance Decomposition of Economic Growth (GDP)

| Period	S.E.	GDP	TRB	DVS	FGNB	INTR
1	4289.661	100.0000	0.000000	0.000000	0.000000	0.000000
2	5128.004	81.87435	1.061175	0.854257	16.17017	0.040047
3	6003.708	62.91927	2.566341	0.715223	33.75347	0.045696
4	7366.420	42.90774	10.95357	0.626161	44.71974	0.792781
5	9259.542	27.42567	20.30357	0.571310	50.25060	1.448851
6	11201.86	18.75494	26.67693	0.624445	52.41089	1.532789
7	13059.48	13.80046	31.21306	0.860643	52.57933	1.546502
8	14755.85	10.81949	34.29326	1.196610	52.16187	1.528773
9	16207.29	8.992450	36.27109	1.606481	51.67562	1.454357
10	17393.01	7.845221	37.55301	2.126098	51.11535	1.360325

Source: Author's Computation from E-views 7.1

Table 5. Impulse Response Function of Economic Growth (GDP)

Period	GDP	TRB	DVS	FGNB	INTR
1	4289.661	0.000000	0.000000	0.000000	0.000000
2	1768.851	-528.2530	473.9611	2062.081	102.6206
3	1071.875	-803.7250	182.0978	2813.200	77.07116
4	777.5469	-2240.276	-286.3251	3478.579	-643.2147
5	480.6307	-3385.888	-387.3702	4337.929	-901.1302
6	139.5623	-4008.309	-541.9663	4762.523	-825.3101
7	-51.84822	-4445.140	-827.2022	4889.587	-845.0984
8	-145.3310	-4629.745	-1066.588	4888.819	-831.3335
9	-251.4187	-4539.502	-1270.593	4707.963	-701.1240
10	-334.8007	-4281.200	-1487.266	4346.605	-543.1043

Cholesky Ordering: GDP TRB DVS FGNB INTR

Source: Author's Computation from E-views 7.1
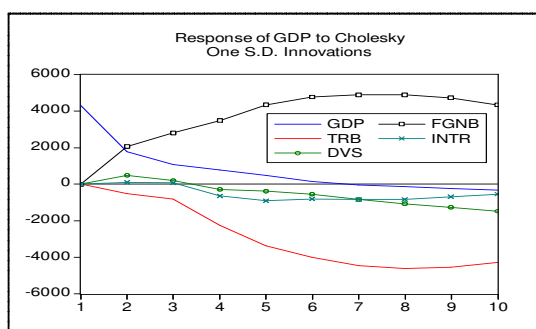
Fig. 2. Impulse Response Function of Economic Growth (GDP)
Source: Author's Computation from E-views 7.1

the lags of the variables are not significant. The high level of the R^2 and F value in the VAR regression estimates for GDP however, gave convincing results that collectively all the lagged terms are statistically significant, implying that domestic debt plays an important role in Nigeria's economic growth.

The variance decomposition analysis revealed that the greater contribution to shocks in economic growth apart from feedback shocks was received from shocks to FGN bonds. Thus, FGN bonds exerts more pressure on the growth rate of GDP, generating about 33% for the first three year period and over 51% for the ten year period shock to the high economic growth in Nigeria. This was followed by shocks received from TRB, while DVS and INTR contributed the least to shocks in GDP.

The results of the impulse response function in support of the variance decomposition analysis showed that economic growth responded positively to shocks in FGNB and negatively to shocks in TRB throughout the ten year period.

Meanwhile, the response of GDP to shocks in DVS and INTR was unstable.

5. SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 Summary

This paper empirically examined the impact of domestic debt on economic growth of Nigeria for the period 1985-2014 using annual time series data on such variables as gross domestic product, treasury bonds, development stocks, FGN bonds and interest rate, sourced from the Central Bank of Nigeria statistical bulletin, 2014. The study employed the Augmented Dickey-Fuller Unit Root test and the Vector Autoregression method. The findings of the multivariate VAR model revealed that domestic debt plays an important role in the growth process of Nigerian economy judging from the high R^2 (0.983616) and the statistically significant F-value (102.0618) of the GDP regression. The variance decomposition analysis revealed that FGN bonds exert more pressure on the growth rate of GDP in Nigeria. This was followed by shocks received from TRB, while DVS and INTR contributed the least to shocks in GDP. The findings of the impulse response function in support of the variance decomposition analysis showed that economic growth responded positively to shocks in FGNB and negatively to shocks in TRB throughout the ten year period. Meanwhile, the response of GDP to shocks in DVS and INTR was unstable.

5.2 Recommendations

The following recommendations were made based on the findings of the study:

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i. The government should resort to acquiring funds majorly through FGN bonds. As shown in the result, FGN bonds have a highly significant positive impact on economic growth.

ii. The government should ensure economic and political stability in order to enjoy the benefits of domestic debt and make the debt burden minimal.

iii. Government should as a matter of urgency begin the process of diversifying its economic base to avoid over reliance on borrowings to finance its deficits.

iv. Macroeconomic policies should be targeted towards maintaining a low rate of interest as it would contribute to economic growth of the country.

5.3 Conclusions

From the findings of this study, it is concluded that domestic debt plays an important role in the growth process of Nigerian economy. The FGN bonds exert more pressure on the growth rate of GDP, followed by treasury bonds, while development stocks and interest rate exert the least pressure on the growth rate of GDP in Nigeria. It is also concluded that economic growth responds positively to shocks in FGN bonds and negatively to shocks in treasury bonds, however, shocks to development stocks and interest rate has unstable effects on GDP in Nigeria.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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