Domestic Debt and Real Sector Growth: A Var Approach.

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Abstract
This paper takes a look at whether domestic debt impact real sector growth in Nigeria with particular emphasis on the agriculture and industry sector growth. Our study likewise looked at a ten (10) month period forecast using the IRF. To achieve our objective, Agriculture growth was proxied by Agric GDP while industry growth proxied by industry GDP. Time series data covering a period of 33 years (1980 – 2013) was used. Data sets were source from the Central Bank of Nigeria economic reports and statistical bulletin of various issues, National Bureau of Statistics, Debt Management Office of the Federation and Federal Ministry of Finance. The descriptive statistics – Skewness, Kurtosis and Jarque-Bera statistics were analysed. The ADF unit root, and Vector Autoregression(VAR) analysis technique was also employed in our estimation. Similarly, the three approaches to estimating VAR - Granger Causality and the Impulse Response Function (IRF) were equally analyzed. The study concludes based on the findings that in an advent of consistency and project tied borrowing, real sector will experience growth and development.

Keywords: Domestic Debt, Real Sector, Impulse Response Function – IRF.

1.0 Introduction

Domestic debt papers have been flooded with heated debates in economic issues in recent times. There seem to be no end to this discussion, especially in a country like Nigeria where domestic debt is forever increasing without corresponding tangible real sector growth. A cursory glance at Nigeria domestic debt reminds us of the origin of domestic debt of 1946 when the first development stock of #600,000 and Treasury bill of 1960 and 1968 worth #8milliom was consummated (Adewoyin 2003, CBN 2005, Onoh 2007 and Umaru, Hamidu and Musa 2013). Between then, the country's domestic debt has been on the increase.
It is noteworthy that domestic debt as a portion of real sector growth (in our case - agric and industry) growth enjoyed a remarkable relationships when the country newly gained independence in 1960 up on to the period 1989. Specifically, total government domestic debt was #8,215.60million while agriculture and industry enjoys a GDP growth of #6,501.83millio and #10,922.91millio. There was an increase in the domestic debt the following year 1981 to #11,192.60million while agriculture and industry GDP growth records an unprecedented growth of #57,989.67million and #89,072.78million respectively. Although domestic debt increased in 1982, 1983 to #15,007.60 and #22,221.40 respectively, agriculture and industry GDP showed a little decline for the same period amounting to #59,450.83million,

#59,009.56million and #83,206.51million and #71,967.76million. Domestic debt continues to increase from these periods while an oscillatory movement was witnessed in that of agriculture and industry GDP growth for the periods' 1984 to 1987 standing at #55,918.17million, #65,748.44, #72,135.23, #69,608.06 and #77,888.80, #85,097.43, #82,860.89 and #81,596.46million respectively. A diagnostic test shows an inverse relationship of these variables from 1991 through 2009 until 2010 to 2013 when agriculture and industry GDP growth grows in excess of domestic debt at #13,048.892.80million, #14,750,523.21million and #12,033,195.91million and 13,014,509.97million (CBN 2005 and 2013, Adofu and Abula 2010; Okonjo-Iweala 2011, Debt Managemet office 2012, Onyeiwu 2012, Sanusi 2012, Okunlola 2013, Umaru et al 2013, Yuguda 2013 and Apere 2014).

Ab initio, it is a common place for researchers to test the relationship between domestic debt and growth, not a handful has compared debt in terms of real sector growth. This study niche is however centred on this discussion.

2.0 Theoretical Consideration

Often time when issues relating to debt and growth are mentioned, the proponents like monetarist or the classicists, Keynes, Wagner's law and Wiseman-Peacock, Solow, Endogenous, Mckinnon and Shaw theories among others are discussed in their nexus (Ezirim 2005, Ogunbiyi and Okunlola 2013). While one tends to postulate reason for improve growth in the economy on one hand using a balanced based funding, the other advice a deliberate intervention by the government through its fiscal stance and borrowing. All of these theories are geared towards the realization of the macroeconomic objectives of price stability, full employment and high growth rate of gross domestic product which many have argued is hinged upon real sector development (CBN 2005 and 2013, Onoh 2007, Adofu and Abula 2010; Okonjo-Iweala 2011, Yuguda 2013 and Apere 2014).

i. Classicists Theory

This is famously traceable to Fisher's equation of exchange (Quantity Theory of Money TQM) given as MV=PQ where M=stock of money, V= velocity in which money moves in an economy; Q= volume of transaction within a given period; while P= general price level in the economy. Accordingly, the monetarists, following from the Quantity Theory of Money (QTM), propounded that the quantity of money is the main determinant of the price level (meaning, money is all that matters), or the value of money, such that any change in the quantity of money produces an exactly direct and proportionate change in the price level. If the equation is transformed substituting Y (total amount of goods and services exchanged for money) for Q, the equation of exchange becomes: MV=PY. The introduction of Y provides the linkage between the monetary and the real side of the economy. In this framework, however, P,V, and Y are endogenously determined within the system. The variable M is the policy variable, which is exogenously determined by the monetary authorities (Aminu and Anono 2012).

Aminu and Anono (2012) further emphasised the monetarists views that any change in the quantity of money affects only the price level or the monetary side of the economy, with the real sector of the economy totally insulated. This shows that changes in supply of money do not affect the real output of goods and services, but their values or the prices at which they are exchanged only. An essential feature of the monetarists' model is its focus on the long-run supply-side properties of the economy as opposed to short-run dynamics (Dornbush, et al, 1996).

ii. Keynes Theory

Keynesian theory contrasts that of the monetarist views of quantity theory of money being directly and proportionately related between quantity and prices. According to this school, the relationship between changes in the quantity of money and prices is non-proportional and indirect owing to the rate of interest. The strength of the Keynesian theory is its integration of monetary theory on the one hand and the theory of output and employment through the rate of interest on the other hand (Aminu and Anono 2012). Thus, when the quantity of money increase, the rate of interest falls, leading to an increase in the volume of investment and aggregate demand, thereby raising output and employment (Aminu and Anono 2012). In other words, the Keynesians see a link between the real sector and the monetary sectors of the economy an economic phenomenon that describes equilibrium in the goods and money market. Considerately important in Keynes postulations is the examination of relationship between the quantity of money and prices under unemployment and full employment situations.

Citing Olofin (2001), Aminu and Anono 2012) observed that so long as there is unemployment, output and employment will change in the same proportion as the quantity of money, but there will be no change in prices. At full employment, however, changes in the quantity of money will induce a proportional change in price Aminu and Anono 2012).

iii. Wagner's Law

Wagner's law is predicated on government reasons for spending. This theory argued that there are inherent tendencies for the activities of different tiers of government to continually rise and necessitate increase funding. In this while, a functional relationship is postulated to exists between the growth of an economy and the growth of government activities to such extent that the grows faster than the general economy (Ezirim 2005).

iv. The Solow Growth Model 1956

The model determines economic growth through the steady and positive increase in total production output of a nation. The model assumes aggregate production output by three factors of labour, capital and technology. It however emphasizes continuous change of technology as a link to increasing output hence; his model is exogenous in nature (Okunlola and Ogunbiyi 2013)

v..Endogenous Growth Model

The model questioned the exogenousity of the Solow growth model. It argued that economic growth (input/output) is seen as reproducible and externalities. Endogenous major concern is of human capital development. That aggregate production relies on the level of human capital building rather technology change has emphasized by Solow growth model.

vi. McKinnon (1973) and Shaw (1973)

The theory remark that growth is hinged on the interplay of financial market activities in an economy. They are of the view that financial market sophistication increases level of intermediation.

3.0 Methodology

The data employ in this study are mainly time series sourced from the Central Bank of Nigeria (CBN) statistical bulletin and economic reports of various issues; the National

Bureau of Statistics (NBS) and the Federal Ministry of Finance (FMoF) and Budget Office of the Federation (BoF). The variables sourced are: domestic debt, as our dependent variable and real sector growth (proxy by Agric and Industry GDP) as the independent variable. The method of analysis for the study is the Vector Auto Regression analysis (VAR). In estimating a (VAR), the granger causality and the impulse response function – IRF was carried out. The study will also be examining the descriptive statistics and ADF unit root.

Model specification

Consider a functional form of a model thus.

Ddbt = f (Agdp, Indgdp) 1

Where : Ddbt is domestic debt

Agdp = Agric growth (proxied by agriculture GDP)

Ingdp = Industry growth (proxied by industry GDP)

If linearly expressed in explicit form, we have;

$Ddbt_t = \Omega_0 + \Omega_1 Agdp + \Omega_2 Indgdp U_t$ 2

Where : Ω_0 = constant, Ω_1= coefficient of employment and U_t = error term.

Secondly, based on the VAR(p) model a set of n time series variable $y_t = (y_{1t}, y_{2t}..y_{nt})$, a VAR(p) model can be written as;

$$y_t = \alpha + A_1 y_{t-1} + A_2 y_{t-2} + ... + A_p y_{t-p} + u_t$$

3

Where:

Yt = 1 – lag of y

α = K x 1 vector of constants (intercept)

A1 = time invariate of kxk matrix

Ut = kx1 of error term

Estimation Technique

This study relies on a sequence procedure in order to determine the effect of domestic debt on agriculture growth and industry growth (as proxies for real sector growth i.e. RGDP) in Nigeria. It commences with the specification of the descriptive analysis of the skweness, Kurtosis and Jarque –Bera statistics. Thereafter, the ADF unit root test was ascertained to determine the order of integration. Traditionally time series data must certify the unit root test for them to become stationary otherwise, they are subjected to differencing. Next is to confirm the VAR Granger causality trend between the estimated variables and determine their levels of significance through make system equations, after which the impulse response function (IRFs) is ascertained.

ADF Unit Root Test

Abinitio the order of integration of the individual series is tested owing to the non stationarity characteristics of most time series data. The estimation equation is as given below (Gujarati and Porter 2009).

$\Delta Yt = \beta_1 + \beta_2 t + \delta Y_{t-1} + \Sigma \alpha i \, \Delta Yt\text{-}I + £_t$ 4

Where: $£_t$ = is a residual time; Yt = is the relevant time series; $£_t$ = random error term

VAR Test/VAR Granger Causality

Given a two variable of VAR(p) as in equation 3 above, the process that A_t does not G-cause y_t if all coefficients in A_{12} (L) = 0 (or a joint test of A_{21} (1) = A_{21} = ... = A_{21} (p) = 0 at all lags

is not rejected is established. By implication, VAR Granger causality theorem suppose that when two variables are co integrated and of I(1), then either one (say A_t), must granger cause another (say y_t) (Medee and Nenbee 2013). This concept involves the effect of past values of *A* on the current value of *y*. So it answers the question whether past and current values of *A* help predict the future value of *y* or not (Granger 1969 and Sims 1979, Gujarati and Porter 2009; Salvatore and Reagle 2011, Wooldridge 20113).

$$\left.\begin{aligned}\Delta Ddbt_t &= A_{1t}\Delta DDBT_{t-1} + B_{1t}\Delta AGDP_{t-1} + C_{1t}\Delta INDGDP_{t-1} + e_{1t}\\ \Delta AGDP_t &= A_{2t}\Delta DDBT_{t-1} + B_{2t}\Delta AGDP_{t-1} + C_{2t}\Delta INDGDP_{t-1} + e_{2t}\\ \Delta INDGDP_t &= A_{3t}DDBT_{t-1} + B_{3t}\Delta AGDP_{t-1} + C_{2t}\Delta INDGDP_{t-1} + e_{3t}\end{aligned}\right\} \quad 5$$

Impulse Response Functions (IRFs)

Basically, the Impulse response Function (IRFs) traces out the responses of current and future values of variables to a shock in one of the VAR equations. Equally, IRF of a dynamic system is its output when presented with a brief input signal, which is called the Impulse (Lu, Xin and He 2010). More specifically, the impulse response refers to the reaction of any dynamic system in response to some external change in the future

4.0 Empirical Analysis

Table 4.1: Descriptive Statistics

	DDBT	AGDP	INDGDP
Mean	947745.5	1026029.	917625.7
Median	413779.2	98218.42	112775.4
Maximum	6537001.	14750523	13028046
Minimum	7119.000	6501.830	10922.91
Std. Dev.	1451136.	3546355.	3175309.
Skewness	2.314864	3.613414	3.614188
Kurtosis	8.472943	14.06823	14.06401
Jarque-Bera	68.51664	232.9769	232.8823
Probability	0.000000	0.000000	0.000000
Sum	30327856	32832939	29364021
Sum Sq. Dev.	6.53E+13	3.90E+14	3.13E+14
Observations	32	32	32

The table represents the descriptive statistics of the variables under review. The Skewness measures the asymmetry of the distribution of the series around its mean, while the Kurtosis measures the normality of the series. For a normal distribution however, the Kurtosis is usually peak at >3 and flat at <3. Invariably, if the Kurtosis is >3, the distribution is peak, otherwise, if it is < 3 then, the distribution is flat. All series in our study however demonstrates peak distribution. Further, the Jarque – Bera test statistics which test whether the series is normally distributed and measures the difference of the skewness and Kurtosis of the series is normally distributed as indicated from the table..

4.2 ADF Unit Root Test Result

Table 4.2: ADF Unit Root Test Result

Variable	ADFStatistics		ADFstatistics		ADF Statistic		Order of integration
	Level	Critical values	1st Difference	Critical values	2nd Difference	Critical Value	
DDBT					-4.767425	1% -4.767425 5% -2.981038 10% 2.629906	I(2)
AGDP	12.53103	1% -3.661161 5% -2.960411 10% -2.619160			0.0000		I(0)
INDGDP			-5.282955	1% -3.653730 5% -2.957110 10% -2.617434	0.0000		I(1)

Source: Eview7 output

In this study, the ADF unit root test was employed to test for the stationarity state of the variables, and the result is as presented in table 4.2 above. The result of the table shows that all variables demonstrate different level of stationarity state. Domestic debt was not stationary at order but became stationary at second difference. Agriculture gross domestic product AGDP became stationary at level. Industry gross domestic product INDGDP was not stationary at level but became stationary at fist difference.

VECTOR Autoregression Estimates

Vector Autoregression Estimates
Date: 02/02/15 Time: 02:14
Sample (adjusted): 1982 2009
Included observations: 28 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	DDBT	AGDP	INDGDP
DDBT(-1)	0.143067	0.004583	-0.005603
	(0.21775)	(0.00636)	(0.00394)
	[0.65703]	[0.72056]	[-1.42157]
DDBT(-2)	-0.109144	0.007189	-0.002245
	(0.25190)	(0.00736)	(0.00456)

	[-0.43329]	[0.97701]	[-0.49242]
AGDP(-1)	10.13790	0.878239	0.348626
	(6.87916)	(0.20096)	(0.12451)
	[1.47371]	[4.37025]	[2.80003]
AGDP(-2)	4.607613	-0.117365	-0.212191
	(8.00779)	(0.23393)	(0.14494)
	[0.57539]	[-0.50171]	[-1.46404]
INDGDP(-1)	-1.213981	0.392234	0.664589
	(8.92302)	(0.26067)	(0.16150)
	[-0.13605]	[1.50474]	[4.11510]
INDGDP(-2)	-0.219281	0.068965	0.166457
	(6.72682)	(0.19651)	(0.12175)
	[-0.03260]	[0.35095]	[1.36720]
C	-793872.6	-22872.85	8724.155
	(617153.)	(18028.7)	(11170.0)
	[-1.28635]	[-1.26869]	[0.78103]
R-squared	0.875213	0.978696	0.933740
Adj. R-squared	0.839560	0.972610	0.914809
Sum sq. resids	3.88E+12	3.31E+09	1.27E+09
S.E. equation	430030.2	12562.33	7783.237
F-statistic	24.54790	160.7915	49.32250
Log likelihood	-398.9078	-299.9796	-286.5751
Akaike AIC	28.99342	21.92711	20.96965
Schwarz SC	29.32647	22.26016	21.30270
Mean dependent	848726.0	131722.1	115052.5
S.D. dependent	1073601.	75905.20	26666.34
Determinant resid covariance (dof adj.)		1.58E+27	
Determinant resid covariance		6.66E+26	
Log likelihood		-983.8731	
Akaike information criterion		71.77665	
Schwarz criterion		72.77580	

Source: Evie output

The table above shows the VAR estimates of the model as specified in the system. The VAR reports a 21 coefficients, standard errors (()), and the t-statistics ([]) as shown in parentheses from the table. To ascertain their level of significant, the study proceeds to generate our make system of order by variable and compare with 0.05 percent level of significance as specified below.

System Equation

DDBT = C(1)*DDBT(-1) + C(2)*DDBT(-2) + C(3)*AGDP(-1) + C(4)*AGDP(-2) + C(5)*INDGDP(-1) + C(6)*INDGDP(-2) + C(7)

AGDP = C(8)*DDBT(-1) + C(9)*DDBT(-2) + C(10)*AGDP(-1) + C(11)*AGDP(-2) + C(12)*INDGDP(-1) + C(13)*INDGDP(-2) + C(14)

INDGDP = C(15)*DDBT(-1) + C(16)*DDBT(-2) + C(17)*AGDP(-1) + C(18)*AGDP(-2) + C(19)*INDGDP(-1) + C(20)*INDGDP(-2) + C(21)

The system equations confirm the presence of 21 equations in the model and indicate the variables at the various lag level. The first equation specifies the dependent variables Ddbt as a function of the coefficient (1)*Ddbt(-1)..C(7), indicating the presence of 7variables in the model. Similarly, the second system equation has 7 specified variables, that are AGDP = C(8)*Ddbt(-1)..C(14). While the last system equation also indicate a total 7 equations starting from IndGDP = C(15)*Ddbt(-1)..C(21). By implication, it shows that there are 21 system equations in our VAR model. To estimate our p value and determine whether the null hypothesis would be accepted or rejected on the basis of 0.05 percent level of significant, the OLS regression was carried and as shown below.

Dependent Variable: DDBT
Method: Least Squares
Date: 01/29/15 Time: 06:11
Sample (adjusted): 1982 2010
Included observations: 29 after adjustments
DDBT = C(1)*DDBT(-1) + C(2)*DDBT(-2) + C(3)*AGDP(-1) + C(4)*AGDP(-2)
+ C(5)*INDGDP(-1) + C(6)*INDGDP(-2) + C(7)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.155838	0.225951	0.689701	0.4976
C(2)	-0.298168	0.232898	-1.280249	0.2138
C(3)	11.43292	7.096129	1.611149	0.1214
C(4)	9.825777	7.637877	1.286454	0.2117
C(5)	-6.403445	8.669594	-0.738610	0.4680
C(6)	-4.148075	6.531816	-0.635057	0.5319
C(7)	-401995.5	591387.4	-0.679750	0.5038

R-squared	0.901124	Mean dependent var	976419.0
Adjusted R-squared	0.874158	S.D. dependent var	1258695.
S.E. of regression	446513.1	Akaike info criterion	29.06283
Sum squared resid	4.39E+12	Schwarz criterion	29.39287
Log likelihood	-414.4110	Hannan-Quinn criter.	29.16619
F-statistic	33.41672	Durbin-Watson stat	1.937080
Prob(F-statistic)	0.000000		

Source : Eview 7 output

The table above shows the corresponding estimates of the system equation for our model. For

equation one DDBT = C(1)*DDBT(-1) + C(2)*DDBT(-2) + C(3)*AGDP(-1) + C(4)*AGDP(-2) + C(5)*INDGDP(-1) + C(6)*INDGDP(-2) + C(7), the corresponding coefficient and their probability values at the different lag level shows an acceptance of the null hypothesis of no statically significant relationship between domestic debt and other specified variables in the model. By implication, this means that domestic debt is not significant to explain C(1)* at DDBTlag (-1)(-2), C(3)*AGDP lag(-1)(-2), C(5)*INDGDP lag(-1) and C(6)*INDGDP lag(-2) and C(7).

Dependent Variable: AGDP
Method: Least Squares
Date: 02/02/15 Time: 02:28
Sample (adjusted): 1982 2009
Included observations: 28 after adjustments
AGDP = C(8)*DDBT(-1) + C(9)*DDBT(-2) + C(10)*AGDP(-1) + C(11)*AGDP(
-2) + C(12)*INDGDP(-1) + C(13)*INDGDP(-2) + C(14)

	Coefficient	Std. Error	t-Statistic	Prob.
C(8)	0.004583	0.006361	0.720558	0.4791
C(9)	0.007189	0.007359	0.977012	0.3397
C(10)	0.878239	0.200959	4.370245	0.0003
C(11)	-0.117365	0.233929	-0.501711	0.6211
C(12)	0.392234	0.260665	1.504740	0.1473
C(13)	0.068965	0.196508	0.350953	0.7291
C(14)	-22872.85	18028.69	-1.268692	0.2184

R-squared	0.978696	Mean dependent var	131722.1
Adjusted R-squared	0.972610	S.D. dependent var	75905.20
S.E. of regression	12562.33	Akaike info criterion	21.92711
Sum squared resid	3.31E+09	Schwarz criterion	22.26016
Log likelihood	-299.9796	Hannan-Quinn criter.	22.02893
F-statistic	160.7915	Durbin-Watson stat	1.866487
Prob(F-statistic)	0.000000		

Similarly, the corresponding estimates of the system equation for our model2 are specified in the table above. For equation2, AGDP = C(8)*DDBT(-1) + C(9)*DDBT(-2) + C(10)*AGDP(-1) + C(11)*AGDP(-2) + C(12)*INDGDP(-1) + C(13)*INDGDP(-2) + C(14), indicate that only the coefficient of C(10) is statistically significant in explaining our independent variable having fall below our 0.05 percent level of significant hence, the null was rejected. While the coefficients C8,C9,C11,C12,C13and C14 are not significant in explaining our dependent variable.

Dependent Variable: INDGDP
Method: Least Squares
Date: 02/02/15 Time: 02:29
Sample (adjusted): 1982 2010
Included observations: 29 after adjustments

INDGDP = C(15)*DDBT(-1) + C(16)*DDBT(-2) + C(17)*AGDP(-1) + C(18)
*AGDP(-2) + C(19)*INDGDP(-1) + C(20)*INDGDP(-2) + C(21)

	Coefficient	Std. Error	t-Statistic	Prob.
C(15)	0.144940	0.901749	0.160732	0.8738
C(16)	-2.230377	0.929476	-2.399607	0.0253
C(17)	15.61372	28.32002	0.551331	0.5870
C(18)	61.29723	30.48208	2.010926	0.0567
C(19)	-60.50653	34.59957	-1.748765	0.0943
C(20)	-46.14444	26.06789	-1.770164	0.0906
C(21)	4627999.	2360174.	1.960872	0.0627

R-squared	0.490673	Mean dependent var	526023.0
Adjusted R-squared	0.351765	S.D. dependent var	2213299.
S.E. of regression	1781994.	Akaike info criterion	31.83087
Sum squared resid	6.99E+13	Schwarz criterion	32.16091
Log likelihood	-454.5476	Hannan-Quinn criter.	31.93423
F-statistic	3.532371	Durbin-Watson stat	0.864256
Prob(F-statistic)	0.013336		

Source:Eview7 output

Again equation 3 INDGDP = C(15)*DDBT(-1) + C(16)*DDBT(-2) + C(17)*AGDP(-1) + C(18)*AGDP(-2) + C(19)*INDGDP(-1) + C(20)*INDGDP(-2) + C(21) indicate only one relatively significant relationship as indicated by coefficient C(16) while every other variables in the model are statistically insignificant having been above our critical 0.05 percent level of significance.

Granger Causality Test Result

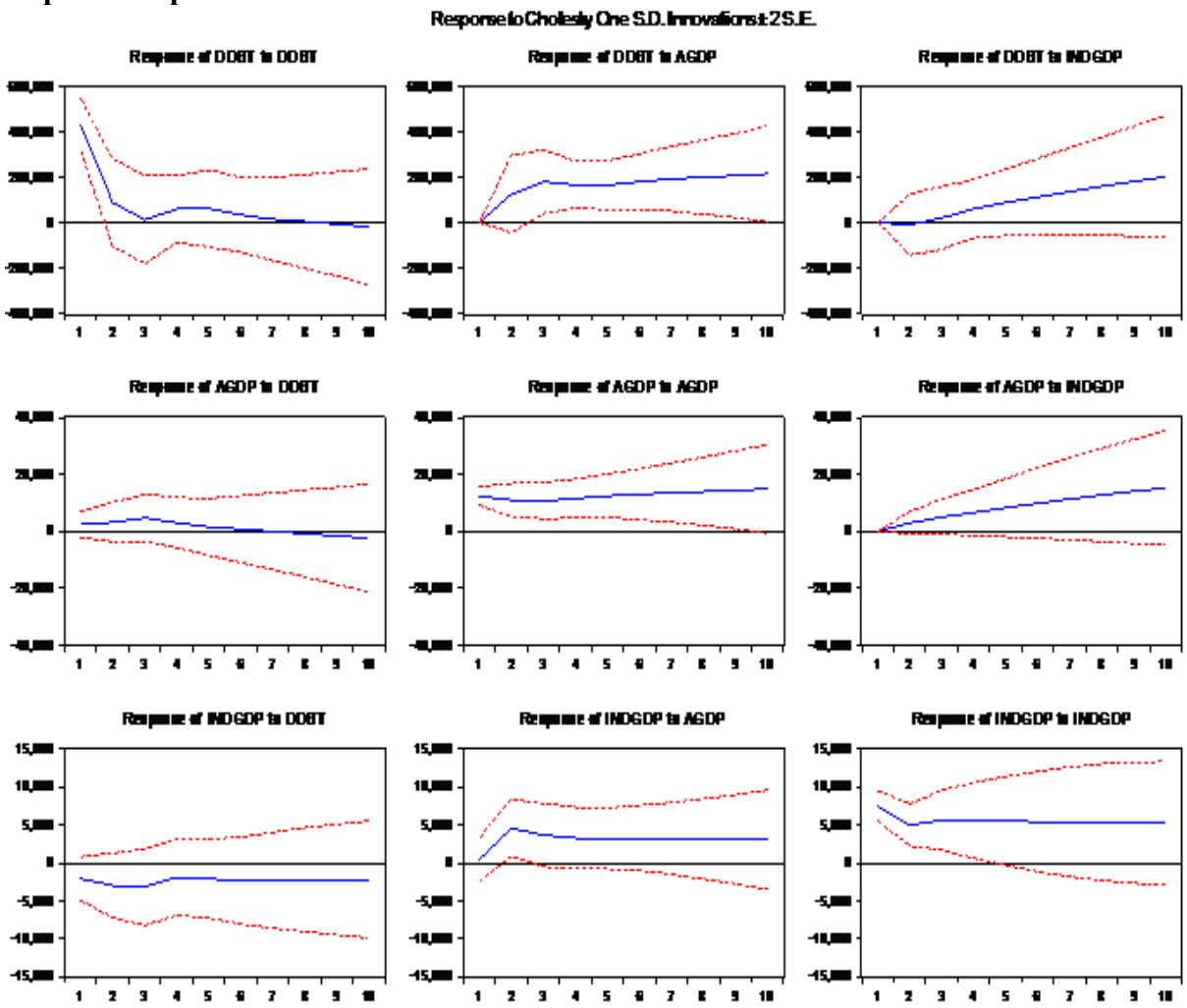
Pairwise Granger Causality Tests
Date: 02/02/15 Time: 03:18
Sample: 1980 2013
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
AGDP does not Granger Cause DDBT	28	7.51480	0.0031
DDBT does not Granger Cause AGDP		0.19214	0.8265
INDGDP does not Granger Cause DDBT	29	1.72171	0.2001
DDBT does not Granger Cause INDGDP		2.54531	0.0994
INDGDP does not Granger Cause AGDP	29	0.63381	0.5392
AGDP does not Granger Cause INDGDP		2.93890	0.0722

Source: Eview7. Note: → means does not granger cause

From the result of the equation of the table, it could be noted that there exist a bi-directional causality between AGDP →DDBT. This support the findings of Umaru et al (2013), Okunlola (2012), Izedonmi and Ilaboya (2012) that domestic debt, if properly managed can lead to a high level of growth in the country. Further, there exists a uni-directional causation exists between INDGDP →DDBT, DDBT →INDGDP, INDGDP → AGDP. In the main, its means agriculture could be further encouraged to serve the purpose greasing the wheel of the economy through its multiplier activities. Similarly, the industry sector need urgent and immediate attention if the vision 20:20:20 is to among others things is to be realized.

Impulse Response Function IRF's



The impulse response function (IRF) - innovation of the model is as specified in the impulse response function graph above. What the IRFs do is to trace out the responses of current and future value of variables to a shock reaction. The IRF graph shows a future ten (10) periods of how the variables react to or response to one another when one standard error shock is given in the residual. From the IRF graph, domestic debt (Ddbt) and domestic debt (dbt) reaction to a one standard error shock is positive but slowly turned negative in the ninth

month and means the shock being introduced lapse in the ninth month. Also response of Dbt to AGDP is positive through the tenth month of forecast. By implication, when one standard error shock is introduced between domestic debt and agriculture growth, the reaction remains positives for the period. Again, when one standard positive shock is given to AGDP, domestic debt is positive in the sixth month period but turn negative in the eight month period. Further, the IRF graph of AGDP to AGDP, AGDP and INDGDP records positive innovation throughout the tenth periods. Response of INDGDP to DDBT shows that shock was negative all lapse through periods. Finally, the response of INDGDP to AGDP and INDGDP to INDGDP also show that when there is a shock both variables remain positive through the tenth month period forecast.

Conclusion

This paper takes a look at whether domestic debt impact real sector growth in Nigeria with specific emphasis on the agricultural sector and industrial sector. To achieve our aim, agricultural sector growth was proxied by agriculture gross domestic (AGDP) while industry growth was proxied by industry gross domestic product. Having certified the stationarity conditions, it was ascertained that domestic debt (DDBT) and industry gross domestic product (INDGDP) became stationary at second difference I(2) and first difference I(1) respectively; while agriculture gross domestic product (AGDP) was stationary at order I(0). Also from the VAR system equation model specified, only C(10) and C(16) indicate a statistically significant relationship while the remain show that they are not statistically significant. The Pairwise Granger causality test was also conducted to determine the direction of causality and result indicates a bi-directional causality of AGDP and DDBT variable and not with the other variables. Similarly, the impulse response function (IRF) for ten periods forecast specified shows standard deviation shock of one variable with the other. That of domestic debt (Ddbt) and domestic debt (dbt) reaction to a one standard error shock is positive but slowly turned negative in the ninth month forecast. That of response of Dbt to AGDP is positive through the tenth month in forecast. AGDP to AGDP, AGDP and INDGDP records positive innovation throughout the tenth periods. Response of INDGDP to DDBT shows that shock was negative all lapse through periods. Finally, the response of INDGDP to AGDP and INDGDP to INDGDP also show that when there is a shock both variables remain positive through the tenth month period forecast. These findings put together are capable of providing real sector growth and development in the advent of consistent, project tied borrowing.

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