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# Public debt and domestic savings: The role of market interest rates

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**Abstract**
The financial system plays an important role in the mobilization of savings and public debt. The market interest rate is therefore a key determinant in pricing savings and debt. To determine how this relationship plays out in Nigeria, this study employed an ARDL (1,1) model to examine the long and short run relationships between public debt, domestic savings and market interest rates in Nigeria. A results show the existence of both a short-run and long-run relationship between the variables under review.

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**Keywords:** Public Debt Stock, Domestic Savings, 90-Day T-Bills, Open Buy Back, Average Weighted Savings Rate

## 1. Introduction

The relationship between savings and interest rates have been extensively reviewed in the finance literature (Mackinnon, 1973; Shaw, 1973; Fry, 1978; Corsepius & Fisher, 1986; and Mashamba, Maweva & Gumbo, 2014) [19, 5, 2, 12]. These studies arrived at various conclusions about how interest rates impact the volume of savings deposits.

Several theories have thus been posited to describe the transmission mechanism between interest rates and aggregate savings which in effect also impacts the cost of borrowing in the money and capital markets where governments source funds to finance their budget deficits.

Some of these theories include the Classical Theory, The Liquidity Preference Theory, The Loanable funds Theory, The Rational Expectations Theory and the Hicks-Hansen Modern Theory of Interest Rates. Under the Classical theory, which is a long term model of interest rate determination assumes that market rates are determined by the interaction between the supply of savings by households and the demand for investment by businesses (including the government establishment). The Liquidity Preference Theory (Keynes 1936) which is seen as a short term theory is derived on the grounds that the demand for money (cash balance)and supply of money in the money and capital markets are equal. The demand for money is said to be made up of transactional, precautionary and speculative demand while the supply for money is determined by monetary policy. The theory argues that the key determinant for both the transactional and speculative demand for money is income while interest rates guide the speculative demand for money. This theory however faces the major limitation of considering only the demand and supply of money as the determinants of interest rate as it ignores several other macroeconomic and social factors which could ultimately affect price levels. Some of these short comings are however addressed by the Loanable Funds Theory which engages several other factors that determine the equilibrium level of interest rates across financial markets, the household, businesses and the government sector. The Rational Expectations Theory on another note is based on the assumption of efficient money and capital markets and argues that current interest rates reflect all available information in the market and are only subject to change when new information impact asset prices. The most modern of these theories, the Hicks-Hansen Theory of Interest Rates (Hicks, 1980 and Hanson, 1976) [10] incorporate both real and monetary factors to show that savings, investments, money supply and liquidity preference are all necessary factors in the determination of interest rates as shown by the equilibrium reached by the intersection of the IS and LM curves.

Government borrowing in the financial markets (both money and capital markets) also has a decisive impact on the direction of interest rates which ultimately affects the behavior of savers (Mackinnon-Shaw Hypothesis). As government increases

borrowing to finance its budget deficit, savers are encouraged to save more but as savings increases relative to the demand for loanable funds, the intuitive argument is that interest rates will fall. This study thus sets out to determine the validity of this hypothesis.

In summary, the key objective of this study is to determine if an increase in government borrowing will lead to an increase in the stock of domestic savings which will ultimately result in a decline in market interest rates.

Section two looks at some stylized facts while section three reviews the body of literature. In section four, we outline the variables and the data sources as well as the methodology adopted in the study. Section five presents and discusses the empirical results. In six, we discuss the conclusion and policy implications while section seven sets out the bibliography.

## 2. Stylized Facts

This section highlights some stylized facts on public debt and domestic savings in Nigeria. We include information on: trends in fiscal deficit and debt; trends in domestic saving; and trends in interest rates

### Public Debt

Public debt in Nigeria has been on an increase and the has risen to ₦28.62 billion as at Q1 2020.

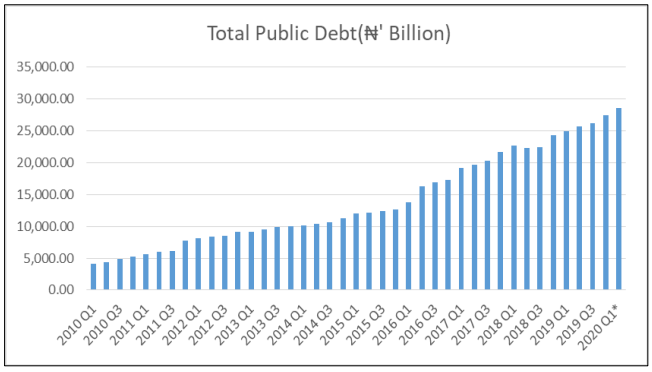



**Fig 1**

### *Debt to GDP*

The ratio of Debt to GDP has more than doubled in the last decade, rising from 7.53 per cent in 2010 to 19.85 per cent as at Q1 2020 (estimated using 2019 GDP). As at Q1 2020, the nominal GDP was ₦35.65 trillion.

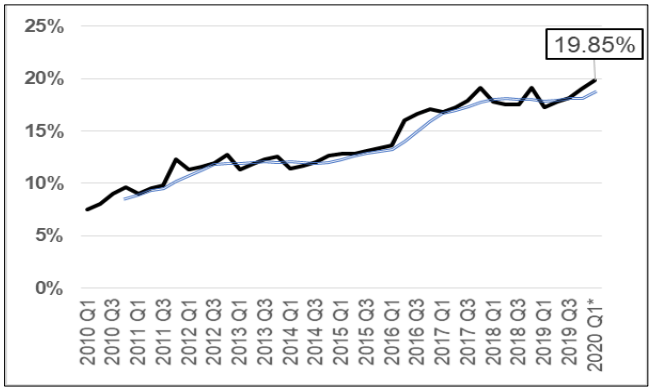



**Fig 2**

### Debt to Revenue Ratio

Gross revenues declined by 11.85 per cent (Y-o-Y) and 16.18 per cent Q-o-Q. This was mainly driven by a massive downturn in gross non-oil revenues which declined by 35.90 per cent (Y-o-Y) and 41.45 per cent Q-o-Q, according to data from the Office of the Accountant General, 2020. The ratio of Debt to Revenue rose to 327.54 per cent in Q1 2020, approaching the previous peak of 343.54 per cent reached in Q4 2016 during the 2016 recession. It increased by 4,212 basis points (Y-o-Y) and 1,404 basis points in Q-o-Q.

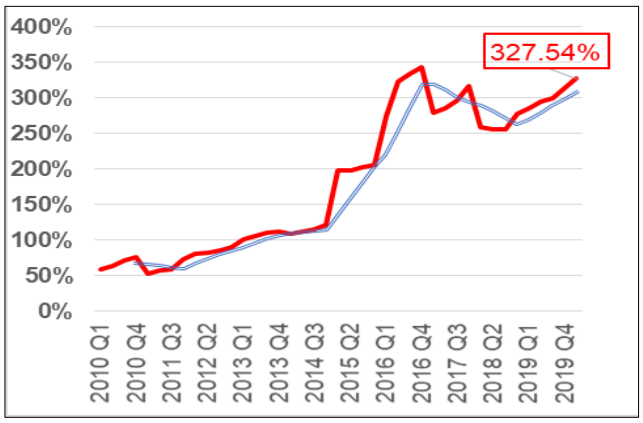



**Fig 3**

### Debt Service to Revenue Ratio

Consequently, the debt service to revenue ratio increased 649 basis points (Y-o-Y) and 2538 basis points (Q-o-Q) to 40.04 per cent. The year on year expansion was driven by a 32.28 per cent increase in external debt servicing charges.

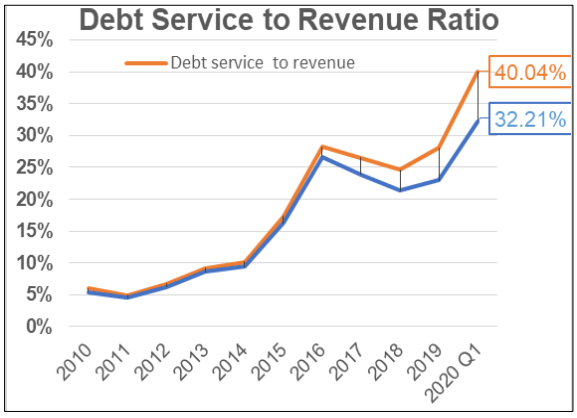



**Fig 4**

### *Domestic Savings*

Domestic savings has been on the increase since 2017 and was at its highest since the turn of the decade by 2019..

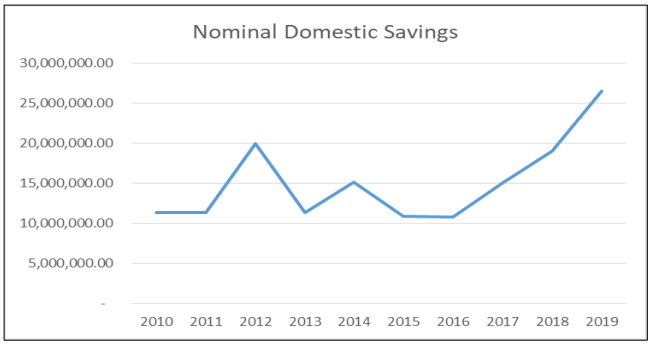



**Fig 5**

**Fiscal Deficit**

The trend in fiscal deficit shows there has been a progressive increase in fiscal deficit since the beginning of the decade, reaching its peak in 2019. As of June 2020, the deficit stood at ₦ -2759.64 Million. The budget is mainly financed with proceeds from crude oil sales and due to the crash in price of crude oil, it has been difficult for the government to generate revenue. Government borrowing from the financial markets is therefore on the rise, thus imparting increased pressure on market rates and crowding out private investors.

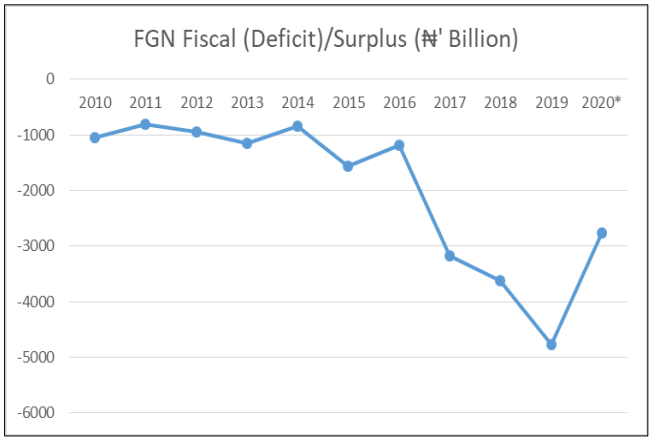



**Fig 6**

**Interest Rates**

**91-Day Treasury Bill Rate and Open Buy Back rate**

The OBB rate peaked between Q1 2017 and Q1 2018. Recently however, the OBB rate has been declining due to the increase in system liquidity mainly due to FAAC disbursements, various CBN interventions and the liquidity trap in the Banking System.

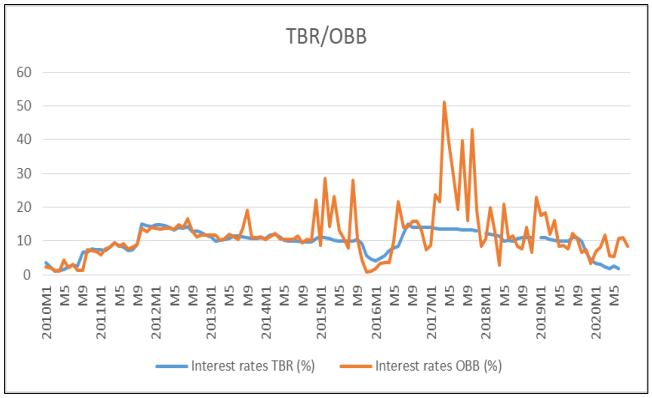



**Fig 7**

## 3. Literature Review

A good number of research studies have investigated the relationship between public debt, savings mobilization and interest rates in both the developing and advance economies. Turner and Spinelli (2013) [20] investigate the interest rate growth differential and government debt dynamic using panel estimation on selected OECD countries for the period of 1980 to 2010. The results of their finding show that the decline in interest rate differential is partly justified by lower inflation volatility combined with the implementation of monetary policy regimes reliably targeting low inflation. This could also be as a result of the very low policy rate and the "global savings glut". However, the interest rate differential might increase in the future due to the debt to GDP ratio of number of countries rising above the threshold. Blanchard (2019) [1] focused on the fiscal and welfare costs of higher debt in an economy where the safe interest rate is lower than the growth rate of public debt in the United States of America and came up with the following conclusions. Firstly, he argued that public debt may have no fiscal cost should the trend in the past continue into the future, issuance of debt with no future increase in taxes is attainable. Secondly, public debt lessens capital accumulation in the situation where there is no fiscal cost and may thus have lower welfare cost that assumed. Thirdly, he argues that the lower the marginal product of capital the lesser the welfare cost of debt and lastly, he argued against a high debt profile. Nwachukwu and Odigie (2011) [13], using an error correction model, examined the drivers of private savings in Nigeria from 1970 to 2007. The result of the investigation revealed that real interest rate increases as disposable income grows. Their result also showed that public savings appears not to crowd out private savings. Assuming that government policies are directed towards improving fiscal balances, there is the tendency for considerable increase in the general savings rate. They therefore concluded that the depth of the financial system has a negative but inconsequential impact on the savings culture in Nigeria. Essien *et al*., (2016) [4] used a VAR model to look at the impact of public sector borrowings on prices, interest rates and output in Nigeria using annual data from 1970 to 2014. They consider such variables as inflation, GDP growth and prime lending rate in their analysis. Their result showed that a shock to the stock of external debt raises the lending rate with a lag. They also observed that the level of both internal and external debt had no meaningful impact on inflation and economic growth and concluded that government borrowing should be channeled towards capital investments rather than recurrent expenditure to increase economic activities. Gamber and Selisk (2019) [7] examines the effect of government debt on interest rate using a simple model with an aggregate production function to show the theoretical link between interest rate, government debt and crowding out of private sector. They also employed a reduce form regression to measure the relationship between interest rate and debt. In addition to the reduced form model, they made use of dynamic stochastic general equilibrium (DSGE) model to illustrate interest rate response to different types of fiscal policies. Their findings show that fiscal policies that gives motivations on investment in private capital by households and firms produce a lower interest rate response than that recommended by the reduced-form model, which does not control or change the nature of the fiscal policy. On The Contrary, it was found that fiscal policy with little or no incentives for households and corporations to invest in extra private capital prompts a higher interest rate response than was indicated by the reduced-form model. Gale (2019) [6] illustrates fiscal policy with high debt and low interest rate using data from the United States of America. In his analysis on the high and rising US debt profile and the expectation of low interest rates on the debt, he demonstrated that future growth in debt will cause output growth to fall and obstruct efforts to enact new policy schemes. His results recommended that short-term policy reactions should not concentrate on debt-financing but an investment that are preferably tax-financed and government should ratify a medium- to long-term debt reduction strategy gradually bring down the stock of public debt. Strauch et al,. (2006) [18]

investigated public debt and long-term interest rates in the Case of Germany, Italy and the USA from 1983 to 2003. Their major focus was to address how accretion of government debt influences interest rate at the domestic and international level. They employed a small multivariate econometric model and found out the at all levels, prolonged debt accumulation produced at least in the short term, higher long-term interest rates and with a transitory impact from the United States to at least two other European countries.

## 4. Methodology and Data Sources

Data for this study was sourced from the Central Bank of Nigeria (CBN). monthly data was used, to enable the identification of the trend components of the data. The sample period ranged from M1 2012 to M1 2019 (end period). The variables used were the Ratio of Domestic Debt to Fiscal Deficit (DFD), Total Deposit Liability In The Banking System (TDL), Normal Savings Rate (NSR), Weighted Average Deposit Rate (WADR), 90-Day Treasury Bill Rate (TB) and Monthly Average Oil Price.

An Auto Regressive Distributed Lag model (ARDL) was found appropriate for the analysis as the variables where both I(0) and I(1). ARDL models are standard least squares regressions that include lags of both the dependent variable and explanatory variables as regressors (Greene 2008). An ARDL model is autoregressive in the sense that the dependent variable is explained in part by lagged values of itself and has a "distributed" lag component in the form of successive lags of the explanatory variable. In some ARDL models, the current value of the explanatory variable may even be exclude from the distributed lag side of the model structure. Although ARDL models have been used in econometrics for a long time, they only became more very popular in recent times as a method of examining cointegrating relationships between variables through work of Pesaran and Shin (1998) and Pesaran, Shin and Smith (2001) [16]. An ARDL (1,1) is one with a lag on both variables set out as:

$$\Delta Y_t = \beta_0 + \sum \beta_1 \Delta Y_{t-i} + \sum \delta_1 \Delta X_{t-i} + \varphi_1 Y_{t-1} + \varphi_2 X_{t-1} + \varepsilon_t$$

Y = dependent variable
X = independent variable
$\varepsilon_t$ = error term
$\boldsymbol{\beta_1}$ and $\boldsymbol{\delta_1}$ = short-run coefficients
$\boldsymbol{\varphi_1}$ and $\boldsymbol{\varphi_2}$ = ARDL long-run coefficients

**An ARDL (p,q) model therefore has p lags of the dependent variable and q lags of the independent variable.**

One major advantage of adopting an ARDL model stems from the fact that its ability to cointegrate non-stationary variables is equivalent to an error correction (EC) process as the ARDL model has a reparameterization in EC form (Engle and Granger, 1987; Hassler and Wolters, 2006) [9]. Therefore, the EC representation permits the testing for the existence of a long-run or cointegrating relationship. In addition, following Pesaran, Shin and Smith (2001) [16], the ARDL also permits a bounds testing process to determine if the variable are cointegrated of order zero or one [I(0) or I(1)].

Our methodology followed a seven-step approach. The first step involved defining our ARDL model as un unrestricted Error Correction Model (ECM). In the second step, we determined the optimal lag structure for our model in eviews before moving to the third step where we examined the model for serial correlation by ensuring that the errors of the model were not serially correlated. In the fourth step, the dynamic stability of the model was tested for before proceeding to the fifth step where we carried out a *Bounds Test* to check for evidence of a long-run relationship amongst the variables. In the presence of a long-run relationship, we moved to the sixth step to obtain the residuals of the model and estimate the long-run model before estimating an ECM (*restricted VAR model*). In the final step, we used the results of both the unrestricted VAR model and long-run model to examine the short -run dynamics and long-run equilibrium relationship between the variables under review. To estimate an ARDL model, one exogenous variable must be included in the model, we therefore include oil price as our exogenous model.

### 4.1 Model Specification

We specify an ARDL (1,1) model as shown below:

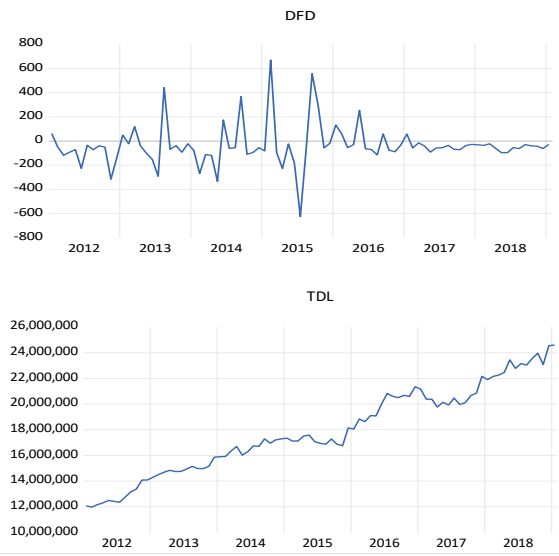
$$\Delta DFD_t = \beta_0 + \sum \beta_1 \Delta DFD_{t-i} + \sum \delta_1 \Delta TDL_{t-i} + + \sum \delta_2 \Delta NSR_{t-i} + \sum \delta_3 \Delta WADR_{t-i} + \sum \delta_4 \Delta TB_{t-i} + \sum \delta_5 \Delta POIL_{t-i} + \varphi_1 DFD_{t-1} + \varphi_2 TDL_{t-1} + + \varphi_3 NSR_{t-1} + \varphi_4 WADR_{t-1} + \varphi_5 TB_{t-1} + \varphi_6 POIL_{t-1} + \varepsilon_t \quad (1)$$

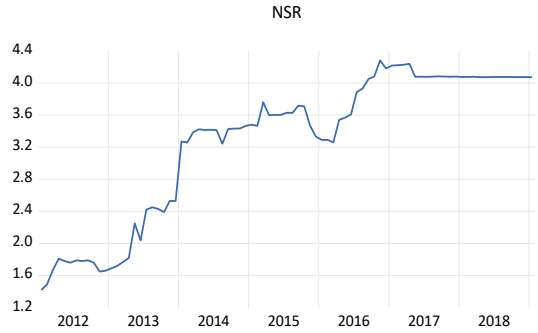
DFD = Domestic Stock as a Ratio of Fiscal Deficit
TDL = Total Deposit Liability of The Banking System
NSR = National Savings Rate
WADR = Weighted Average Deposit Rate
TB = 90-Day Treasury Bill Rate
POIL = Oil Price (proxied by the price of WTI)

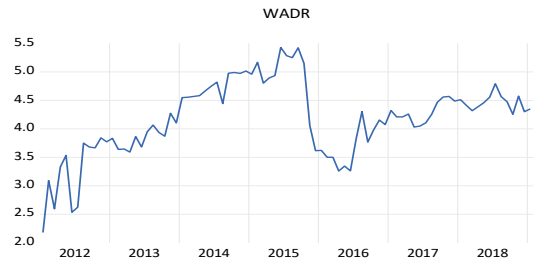
## 5. Empirical Results

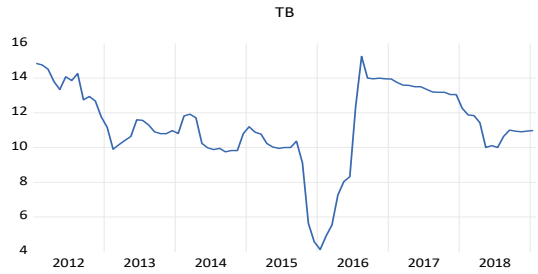
A graphical analysis was initially used to study the properties of the individual variables. From the graphs, we observed that the national debt stock, national savings rate and total liability of the banking system were mostly upward trending. This suggests that there may be some preliminary relationship between these variables which further econometric analysis may highlight. The Interbank and Open Buy Back rates however demonstrated significant volatility throughout the period while the weighted average deposit rate and the 91-day treasury bill rate showed some upward movement with some volatility and downward trend.

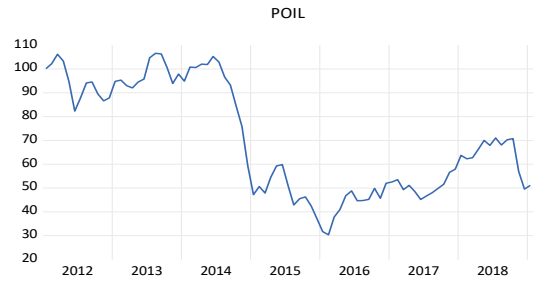
### 5.1 Graphical Analysis






## 5.2 Unit Root Test

The result of the unit root test using the ADF is presented below:

**Table 5.1:** ADF Unit Root Tests

| Variables | | ADF |
|---|---|---|
| DFD | Level | -7.7861 (0)*** |
| TDL | Level | -3.1139 (0) |
| | 1st Difference | -12.1114 (0)*** |
| NSR | Level | -1.4303 (0) |
| | 1st Difference | -10.7304 (0)*** |
| WADR | Level | -3.2440 (0) |
| | 1st Difference | -10.8954 (0)*** |
| TB | Level | -2.7965 (1) |
| | 1st Difference | -6.1648 (0)*** |
| POIL | Level | -1.9519 (1) |
| | 1st Difference | -6.3812 (0)*** |

***,** and *denote significance at the 1%, 5% and 10%.The numbers in parenthesis represents the lag lengths for all tests.

From the ADF test, most of the variables were stable at first difference except DFD which was stable at levels.

## 5.3 Lag Length Selection Criteria and The Johansen Cointegration Test

The lag length selection test was conducted and a lag length of one (1) was selected using the Schwartz Information Criteria (SIC). This lag length was applied to both the long run and short run model.

**Table 5.2:** ARDL Model (Showing Long and Short-Run Variables)

| Variables | Coefficients | T-Statistics | Probability |
|---|---|---|---|
| C | 167.6884 | 0.686701 | 0.4945 |
| DDFD(-1) | 0.306923 | 2.654014 | 0.0098 |
| DTDL(-1) | 6.29E-06 | 0.136681 | 0.8917 |
| DNSR(-1) | 80.26331 | 0.508696 | 0.6126 |
| DWADR(-1) | -99.42413 | -1.349261 | 0.1816 |
| DTB(-1) | 3.089843 | 0.123937 | 0.9017 |
| DPOIL(-1) | -1.547454 | -0.382649 | 0.7031 |
| DFD(-1) | -1.265361 | -7.830663 | 0.0000 |
| TDL(-1) | -3.37E-06 | -0.231064 | 0.8179 |
| NSR(-1) | -14.14257 | -0.197619 | 0.8439 |
| WADR(-1) | 21.43710 | 0.447227 | 0.6561 |
| TB(-1) | -7.477319 | -0.802127 | 0.4252 |
| POIL(-1) | -1.674657 | -1.268411 | 0.2089 |

## 5.4 Test For Serial Correlation

We examine the stability diagnostics of our model using the Breusch-Godfrey Serial Correlation LM Test and observe that the probability for the F-Statistics (0.2046) is well above the 5% level. We were therefore not able to reject the null hypothesis of no serial correlation.

## 5.5 ARDL Model Stability Diagnostics

The stability diagnostics also showed that the model used was stable as shown in the output of our ***Cusums Test*** in the figure below with the blue line sitting within the two red bounds.

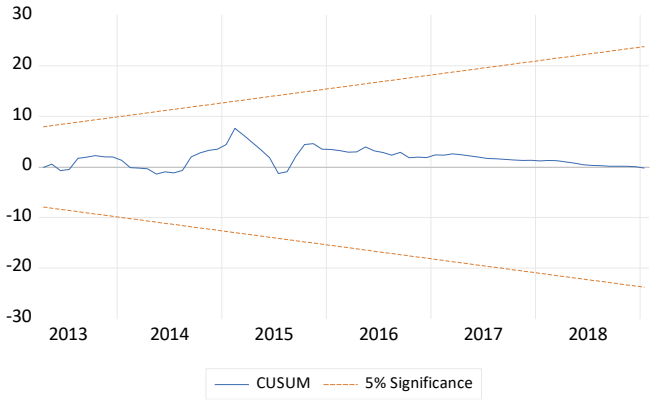



**Fig 8**

With these diagnostics showing stability, we proceeded with our bounds test. We have a total of thirteen (13) coefficients so we extracted the long run coefficient s to test if they are statistically significant. To test if the coefficients of our long run variables are statistically significant, we conducted a Wald Test (joint test on all the six (6) long run coefficients

with the null hypothesis C(8)=C(9)=C(10)=C(11)=C(12)=C(13)=0) with the results shown in the table below.

**Table 5.3:** Wald Test for Coefficients of Long-Run Variables

| Test Statistics | Value | Probability |
|---|---|---|
| F-Statistics | 10.34632 | 0.0000 |
| Chi-Square | 62.07790 | 0.0000 |

### 5.6 Error Correction Model

Our F-Statistics in the above result shows that the coefficients in our model are all statistically significant. We however exercise caution in interpreting the statistical significance of our F-Statistics even though the probability value for the F-statistics shows that the long-run coefficients are statistically significant, a further confirmation is required following Pesaran, Shin and Smith (2001) [16]. Pesaran *et al* (2001) [16] argue that exact critical values for the F-Statistics for a mix of I(0) and I(1) variables which we adopted in our study are not available and thus provide a table which specifies bounds on the critical values of the asymptotic distribution of the F-Statistic with lower bound values for I(0) and upper bound values for I(1) variables. Following this table, we observe that out F-Statistic (10.34632) is greater than the upper bound of the critical bound for five explanatory variables ($K=5$) at the 1%,5% and 10% levels of significance (-5.13, -4.52 and-4.21) thus leading us to reject the null hypothesis of no long-run equilibrium relation and conclude that the model is significant and that there is a long-run relation between the dependent variable and the explanatory variables. We therefore proceeded to estimate the error correction model (ECM). Before proceeding to estimate the ECM, we first obtain the residuals from the long-run model (as the basis for short-run adjustments) by re-estimated the long-run model. We then proceed to estimate the ECM (short-run model) which includes the differenced values of the dependent variable and explanatory variables with the error correction term also coming in at the end. From this model, we derive the coefficient of the short term variables and very importantly the coefficient of the error correction term which represents the speed of adjustment towards long-term equilibrium. For the model to be significant, the coefficient of the error term must be negative and statically significant to demonstrate that when the system is moving away from equilibrium in one direction, it will adjust it back towards equilibrium in the opposite direction. From our results, the coefficient of the error term is given as (-1.265). this tells us that if the system is moving away from equilibrium in one direction, about 126% of departures from equilibrium is corrected in every period. Table 5.4 below shows our ECM.

**Table 5.4:** Error Correction Model (Short-Run)

| Variables | Coefficients | T-Statistics | Probability |
|---|---|---|---|
| C | -2.682444 | -0.132817 | 0.8947 |
| DDFD(-1) | 0.306500 | 2.758886 | 0.0073 |
| DTDL(-1) | 1.55E-06 | 0.036900 | 0.9707 |
| DNSR(-1) | 79.78165 | 0.543261 | 0.5886 |
| DWADR(-1) | -100.2177 | -1.552639 | 0.1247 |
| DTB(-1) | 5.290083 | 0.232461 | 0.8168 |
| DPOIL(-1) | -1.430099 | -0.384731 | 0.7015 |
| ECT(-1) | -1.265414 | -8.128284 | 0.0000 |

### 5.7 Test for Serial Correlation in the ECM

We examine the stability diagnostics of our model using the Breusch-Godfrey Serial Correlation LM Test and observe that the probability for the F-Statistics (0.1906) is well above the 5% level. We were therefore not able to reject the null hypothesis of no serial correlation.

### 5.8 Model Stability Diagnostics for the ECM

The stability diagnostics also showed that the model used was stable as shown in the output of our Cusums Test in the figure below with the blue line sitting within the two red bounds.

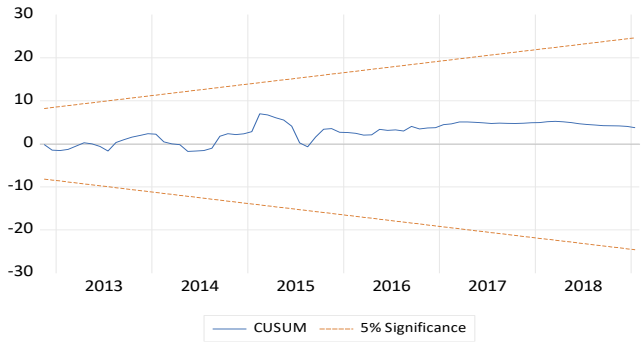



**Fig 9**

### 1.0 Conclusion and Policy Implications

Our investigation revealed the presence of macroeconomic structures (long-run relationship) between the dependent variable (ratio of Debt to Fiscal Deficit, DFD) and the explanatory variables comprising of Total Deposit Liability In The Banking System (TDL), Normal Savings Rate (NSR), Weighted Average Deposit Rate (WADR), 90-Day Treasury Bill Rate (TB) and Monthly Average Oil Price. Our Error Correction Model (short-run model) also showed that whenever the relation was subject to a shift from long-run equilibrium, there was a sizeable adjustment towards equilibrium. This led us to conclude that the stock of government debt in Nigeria is a function of the total deposit liability in the banking system, national savings rate, weighted average deposit rate and government treasury bill rate as endogenous variables as well as the price of crude oil, an exogenous variable. We conclude thus that government debt stock tends to rise when there is an increase in the total deposit liability in the banking system, increase in the treasury bill rate and rise in oil price.

The relationship between rising debt and rising oil price is interesting as this signposts pro-cyclical fiscal policy rather than a counter-cyclical regime. Fiscal policy must this work exhaustibly to ensure that government adopts a counter-cyclical fiscal policy by building sizeable fiscal buffers in times of rising oil prices to enable it maintain a pre-determined spending level come boom or bust.

### References

1. Blanchard OJ. Public Debt: Fiscal and Welfare Costs in a Time of Low Interest Rates, 2019, (No. PB19-2).
2. Corsepius U, Fischer B. Interest rate policies and domestic savings mobilization: A survey of the empirical evidence of Asian countries (No. 267). Kiel Working Paper, 1986.
3. Dalziel P. The Keynesian multiplier, liquidity

preference, and endogenous money. Journal of Post Keynesian Economics. 1996; 18(3):311-331.
4. Essien SN, Agboegbulem N, Mba MK, Onumonu OG. An empirical analysis of the macroeconomic impact of public debt in Nigeria: CBN Journal of applied statistics. 2016; 7(1):125-145.
5. Fry MJ. Terms-of-trade dynamics in Asia: An analysis of national saving and domestic investment responses to terms-of-trade changes in 14 Asian LDCs. Journal of International Money and Finance. 1986; 5(1):57-73.
6. Gale WG. Fiscal Policy with High Debt and Low-Interest Rates. Maintaining the Strength of American Capitalism, Melissa S. Kearney and Amy Ganz, eds. Aspen Institute Economic Strategy Group, 2019.
7. Gamber E, Seliski J. The effect of government debt on interest rates. Working Paper 2019-01.
8. Greene WH. The econometric approach to efficiency analysis. The measurement of productive efficiency and productivity growth. 2008; 1(1):92-250.
9. Hassler U, Wolters J. Autoregressive distributed lag models and cointegration. In Modern econometric Analysis 57-72: Springer, Berlin, Heidelberg, 2006.
10. Hicks J. IS-LM: an explanation. Journal of Post Keynesian Economics. 1980; 3(2):139-154.
11. Kinoshita N. Government debt and long-term interest rates (No. 2006-2063). International Monetary Fund, 2006.
12. Mashamba T, Magweva R, Gumbo LC. Analysing the relationship between Banks' Deposit Interest Rate and Deposit Mobilisation: Empirical evidence from Zimbabwean Commercial Banks, 2014, (1980-2006).
13. Nwachukwu TE, Odigie P. What drives private saving in Nigeria, 2011.
14. Omodero CO. Domestic Debt and Private Sector Credit in Nigeria: An Empirical Investigation. Acta Universitatis Danubius. Œconomica, 2019; 15(6).
15. Pesaran H, Shin Y, Smith JS. Bounds Testing Approaches To The Analysis of Level Relationships" Journal of Applied Econometrics. 2013; 16(3):289-326.
16. Pesaran MH, Shin Y, Smith RJ. Bounds testing approaches to the analysis of level relationships. Journal of applied econometrics. 2001; 16(3):289-326.
17. Pesaran HH, Shin Y. Generalized impulse response analysis in linear multivariate models. Economics letters. 1998; 58(1):17-29.
18. Paesani P, Strauch R, Kremer M. Public debt and long-term interest rates: the case of Germany, Italy and the USA (No. 656): ECB working paper, 2006.
19. Shaw ES. Financial Deepening in Economic Development, New York, Oxford University Press, 1973.
20. Turner D, Spinelli F. Interest-rate-growth differentials and government debt dynamics. OECD Journal: Economic Studies. 2012-2013; (1):103-122.