FOREIGN DEBT AND ECONOMIC GROWTH DYNAMICS: FURTHER EVIDENCE FROM NIGERIA

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ABSTRACT
This paper examines the relationship between foreign debt and economic growth in Nigeria. It covers the period from 1970 to 2017, and evaluates the impacts of macroeconomic variables on growth. Specifically, it analyses the average impacts of gross fixed capital formation, openness and real interest rate on growth. By employing the ADF, PP and KPSS techniques to test the stationarity of the series, the Bai and Perron (2003) methodology is however adopted to confirm the presence of structural breaks. The linear and polynomial relationships connecting the variables are used as the basis for analysis by adopting OLS and ARDL techniques. Whereas one way causality is established running from foreign debt to growth, a no-causal relationship is rather revealed between growth and the square of foreign debt. Furthermore, the linear analysis establishes an inverse relationship in the short-run, while the polynomial analysis reports insignificant relationship between the variables in both the short-run and long-run. Thus, in conclusion, an inverse relationship is established between foreign debt and economic growth in Nigeria. It is therefore suggested that government should take caution in obtaining more loan from foreign sources.
Keywords: ARDL economic growth, foreign debt, non-linear relationship, OLS, structural break
JEL classification codes: F41, H50

1 Introduction
In the quest for economic development, the Federal Government of Nigeria seeks foreign loan in the sum of $247.3m from international agencies. According to the government, $150m and $50m are respectively coming from African Development Bank (AfDB) and Africa Grow Together Fund for rural and other electrification projects; while $20m would be got from French Development Agency for building and rehabilitation of roads in Lagos state (see Ameh, 2019). Meanwhile in 2016, following the recessionary period, government decided to borrow the sum of $29.96bn from International Monetary Fund (IMF) and The World Bank. Meant for financing critical infrastructure deficiency between 2016 and 2018,the loancomprised$11.274bn for projects and programmes, $10.686bn for special national infrastructure projects, $4.5bn for Euro bonds, and $3.5bn to support the 2016 central budget (see Gabriel, 2016).
Meanwhile, borrowing from foreign sources ought to be a potent instrument for a government willing to bridge fiscal gap, as well as build economically efficient and growth-enhancing projects and programmes (see Bailey, 1995). However, despite the country's debt reaching ₦24tn with less than one per cent growth rate as embedded in Figure 1, the government is yet confident on the sustainability of Nigeria's foreign debt (see Onuba, 2019).Imperatively, the country's debt profile makes IMF worry about the amount which increased from $3627.50m in the first quarter of 2009 to $25.27bn in 2018 and further to about $79.44bn in the first quarter of 2019 (see Trading economics, 2016; Amaefule, 2019; Nweze, 2019). But then, as countries are committed to servicingtheir loan obligations, including interest accrued, the 'compounding' arrangement always makes debt servicing as large as the principal stock. As such, Nigeria's foreign debt service

payments increased from ₦0.03bn in the 1970s to ₦415.66bn in 2010 and continuously to ₦1.06tn, ₦1.584tn and ₦1.959tn in 2015, 2016 and 2017, respectively (see CBN, 2018). In effect, Table 1 presents statistics on interest payment on foreign debt, inflation rate, as well as certain other macroeconomic indicators over the period considered. In the table, inflation rate is double-digit all through the periods while growth rate reached all-period highest level during the period 2000-2004. Thus, given Nigeria's humongous and increasing foreign debt, should the government obtain more loans from foreign sources amid contracting growth?

Table 1. Growth rate, foreign debt as % of GNI and other indicators in Nigeria, 1970-2017

Year	Gdp (%)	Total foreign debt (% of GNI)	Inflation rate (%)	Real interest rate (%)	Interest paid on foreign debt (%)	Multilateral debt (% of Total foreign debt)	Total reserve (% of Total foreign debt)	Exchange rate
1970-1979	7	9.4	15.8	-7.9	0.3	19	157.8	0.7
1980-1989	-1.4	75.4	20.9	-6.5	4.4	7.7	22	2.2
1990-1994	3.1	160.7	35.8	-2.5	7.4	13.2	8.2	15.9
1995-1999	2.1	103.5	25.5	-1.7	2.6	13.9	17.9	36
2000-2004	11.5	62.8	13.5	6.1	1.2	9.3	32.3	119.1
2005-2009	6.3	6.5	10.9	7.2	1.1	57.2	920.3	130.6
2010-2014	5.6	2.4	10.7	-1.6	0.03	53	458.4	155
2015-2017	0.6	8.4	12.4	10.3	4.8	34.2	452.6	250.9

Source: Author's computation using data from CBN (2018) and World Bank (2018)

Imperatively, numerous studies have discussed issues surrounding foreign debt and growth in Nigeria. The conclusions have been either that foreign debt impacts growth positively (see Monogbe, 2016; Ewubare, Nteegah & Okpoi, 2017) or negatively (see Mbah, Agu & Umunna, 2016) or there is no relationship between the two variables (see Ogunmuyiwa, 2011; Ibi & Aganyi, 2015). But then, a time-period analysis spanning over thirty years may generate misleading inference if there are undetected structural breaks or non-constant parameters in the series (see Zivot & Andrews, 1992).Thus, by employing the structural break technique, the objective of the present paper is to provide answer to the above question by examining the extent to which foreign debt impacts growth over the period 1970-2017 in Nigeria. The period is important because the surge in the country's foreign debt stock dates back to the 1980s and increases further even after settling the Paris and London Clubs debts in 2005.

After the introduction, the other aspect of the paper is organized as follows. Section two reviews some theoretical literature as well as relevant empirical studies on growth and foreign debt.

Theoretical framework and methodology is provided in section three while results are discussed in section four. Section five wraps the paper with conclusion and recommendations.

2. Relevant Literature

The theoretical postulations on the relationship between public debt and growth fall under three major approaches: the Keynesian, the Neoclassical, and the Ricardian equivalence postulations. In the Keynesian opinion, an expansionary fiscal policy in the form of increasing fiscal deficit and accelerating debt would stimulate demand and high rate of growth through the fiscal multiplier (see Baumol-Maurice, 1955). The Neoclassical theory, on the contrary, underscores declining growth as foreign debt increases. This group of economists explains the detrimental effect of high indebtedness on growth such that growth decelerates upon a decline in investment which necessarily occurs from high level of interest rate (see Saint-Paul, 1992). The Ricardian equivalence approach, however, emphasizes that growth is not affected by indebtedness (see Barro, 1989).

Meanwhile, the necessity of foreign debt is implied by Chenery and Strout (1966) who stress that foreign aid is a way to filling the investment-savings and import-export gaps in order to achieve the required growth rate of an economy. However, toeing the line of neoclassical postulation, the debt overhang theory of Krugman (1988) holds the view that high level of foreign debt depresses economic growth in low-income economies. Accordingly, debt overhang relates to fiscal problem of transferring resources from capital scarce to capital surplus countries. In effect, the mechanism through which the detrimental impact of servicing large amount of foreign debt could be felt include stifling of private investments or 'crowding out' effect, inability to access international financial market, increase in money supply leading to inflation, and the effect of uncertainty on the general performance of the economy (see Claessens & Diwan, 1990).

2.1 Empirics on Nigeria

Imperatively at the empirical front, numerous studies on the nexus between foreign debt and growth have been carried out on Nigeria. For example ,Ajayi and Oke (2012) investigate how effective is external debt burden on economic growth and development of Nigeria. By employing Ordinary Least Squares (OLS) method to analyze the variables which include national income, debt service payment, external reserves, and interest rate, the paper finds national income adversely affecting external debt in the country. Thus, it is suggested that foreign exchange earnings and contracted loan should be channeled to profitable venture. In review, however, it is specifically observed that the paper does not conduct unit root test. As a consequence thus, all findings from its analyses might be spurious. Also, by adopting OLS and Johansen cointegration, among other econometric techniques, Sulaiman and Azeez (2012) examine the effect of external debt on the economic growth of Nigeria over the period 1970-2010. The study employs GDP, external debt, ratio of external debt to export, inflation, and exchange rate as variables of interest. After reporting the existence of long-run relationship among the variables, the findings further establish external debt impacting positively on the Nigerian economy. The paper therefore recommends that external debt should be obtained for economic reasons. In review, it is observed that the series are integrated at I(0) and I(1). Thus, by implication, the ARDL technique should have been adopted rather than the Johansen method which is appropriate for purely I(1) series. Essentially, ARDL would have provided robust results.

Moreover, in the attempt to ascertain whether, or not, external debt's influence on economic growth is a crucial policy issue, Ibi and Aganyi (2015) analyze how external debt impacts growth

in Nigeria. While considering the period 1970-2011, Vector Auto-Regression (VAR) technique is used to test the relationship among ratio of external debt to exports, inflation, real exchange rate and public investment and economic growth. The result establishes a weak causality between external debt and economic growth, such that external debt could not be used to forecast growth dynamics in Nigeria. The paper therefore suggests fiscal discipline and sense of responsibility in handling public fund for growth-promoting debt. In review, however, the paper does not report the unit root, Granger causality, as well as the overall OLS result. The report of the tests would have shed more light on the findings and suggestions of the paper which appear as had hoc.

Meanwhile, in an investigation on the intergeneration effect of externally borrowed fund on the economic performance of Nigeria, Monogbe (2016) considers the period 1981-2014. Upon the use of several techniques which include OLS and Granger-causality, findings show a significantly positive relationship between external debt and growth. The paper therefore recommends that government should be meticulous about which sector of the economy funds are channeled when spending is being increased via external debt. Moreover, Mbah, Agu and Umunna (2016) use the Granger causality and ARDL bound testing approaches to investigate the impact of external debt on economic growth over the period 1970-2013 in Nigeria. After confirming the presence of a long-run relationship, the result establishes a unidirectional causality running from external debt to growth as the former impacts negatively on the latter. It is, however, recommended that government should embark on prudent borrowing and encourage export-oriented growth. It is observed that all series except GDPGR are non-stationary. As such, structural break test, if conducted, would have revealed the cause of non-stationarity in the series.

Furthermore, in a study covering the period 1980-2013, Ugwuegbe, Okafor and Akarogbe (2016) examine the effectiveness of external borrowing and foreign financial aid on the growth of the Nigerian economy. Findings from OLS and Johansen co-integration techniques show that while external debt is positive and significantly effective on economic growth, foreign aid is rather not effectively significant. In review, since the periods considered extend beyond 30 years, then the paper would have tested for structural break to reveal significant dates relating to macroeconomic activities of external debt and growth. Also, while examining the effect of public borrowing on growth of the Nigerian economy, Ewubare, Nteegah and Okpoi (2017)consider the period 1980-2015.The ARDL result reveals that external debt is significant and positively stimulates growth. Prudent utilization of borrowed funds, among others, is thus recommended. In review, the paper reports 'no structural break' whereas it does not account for the non-stationarity of GDPR. In addition, the long-run and short-run results fail to show estimated values of $GDPR_{t-1}$ which is fundamentally required in the use of ARDL as a dynamic technique.

Nevertheless, in a critical process into the origin and metamorphosis of external debt unsustainability, Adegboyega (2018) examines the impact of external debt on economic growth between 1981 and 2016 in Nigeria. While the ARDL short-run results establish negative impact of exchange rate on growth, a positive effect is rather revealed specifically from ratio of external debt to gross national income, and between ratio of reserves to total debt and foreign exchange rate. Thus, the paper recommends the use of self-liquidating investment as panacea to long-term external debt problem. In review, however, the recommendation is had hoc as it does not emanate from the analyses, and findings of the paper.

2.2 Some Foreign Empirics

Several empirical studies across other countries have also expressed different views on the relationship between growth and debt. For example, Baldacci and Kumar(2010), Reinhart,

Reinhart and Rogoff (2012), among others, are of the opinion that a negative relationship subsists between growth and government debt as indebtedness causes detrimental impact on growth. On the contrary, however, some others which include Kumar and Woo (2010), Ceccetti, Mohanty and Zampolli (2011) and Baum, Chacharita and Rother (2013), emphasize the threshold effect, as well as a non-linear relationship between the two variables.

3. Theoretical Framework and Methodology

3.1 Theoretical Framework

Essentially, considering the situation of largely increasing foreign debt and falling growth in Nigeria, the debt overhang hypothesis in line with neoclassical framework is found appropriate and is adopted for the study. The framework takes off from an aggregate production function of the form $Y = f(K, L)$ where Y represents output, K is the stock of both human and physical capital, and L represents labour force. Therefore, following the fact that growth-foreign debt relationship is not an isolated case, then in line with Afonso and Alves (2014),a modified production function of the form $Y = f(K, L, Fdbt)$is utilized. Where, *Fdbt* is foreign debt as share of GDP.

3.2 Methodology

In the attempt to establish the type of relationship connecting foreign debt and economic growth in Nigeria, a single equation is estimated and as such, OLS is adopted. Essentially as a pre-analysis requirement, the unit root test is conducted through the techniques of Dickey and Fuller (1979), Phillips and Perron (1988) and Kwiatkowski, Phillips, Schmidt and Shin (1992). In addition, causal relationship is ascertained using Granger (1969), while Bai and Perron (2003) methodology is used to test for breaks. Moreover, some macroeconomic control variables are introduced to confirm the specific average impact of foreign debt on growth in a linear and non-linear framework. Finally, post-analysis diagnostics are carried out. Imperatively, all data are secondary and sourced from the statistical bulletin of CBN (2018) and world development indicator of The World Bank (2018).

3.3 The Models and Estimation Procedure

In order to examine the nexus between economic growth and foreign debt in Nigeria, a stepwise procedure is adopted. Therefore, following Swamy (2015), the relationship is analyzed as follows.

3.3.1The linearity test

The first step investigates the dynamic linear relationship connecting growth and foreign debt. This is carried out following empirical studies of Barro and Sala-i-Martin (2004), and Swamy (2015). In the attempt to account for the average impact of other activities on growth in the economy, openness, domestic investment, and interest rate are introduced as control variables in (1) along the works of McKinnon (1973), Rivera-Batiz and Romer (1991), Barro (1996), and Kowalski (2000). Thus,

$$g_{rt} = \alpha_0 + \alpha_1 gr_{t-1} + \beta_1 Fdbt_t + \gamma_i\left(Gfcf_{t,}, Opn_t, Rir_t\right) + \varepsilon_t \qquad (1)$$

wheregr_tandgr_{t-1} respectively represent the current and immediate past year (one year lagged) annual percentage of growth, *Gfcf* is gross fixed capital formation (proxy for domestic investment) as percentage of GDP, *Opn* is openness measured as percentage of trade in GDP, *Rir* is real interest rate as percentage of GDP, γ is parameter for the control variables, and *i* ranges from 1 to 3.

3.3.2The nonlinearity test

The next step analyzes nonlinear relationship linking growth and foreign debt. However, the theoretical basis upon which the relationship rests is not very clear in the literature (see Greiner, 2013). Meanwhile, diverse frameworks and specifications have been adopted by several empirical studies which include Kumar and Woo (2010), Egert (2015) and Swamy (2015) with different but convergent opinions on the nonlinear or polynomial growth-foreign debt nexus. Thus, the nonlinear effect is captured by introducing squared term of foreign debt into the right-hand-side of (1) as follows.

$$gr_t = \alpha_0 + \alpha_1 gr_{t-1} + \beta_1 Fdbt_t + \beta_2 Fdbt_t^2 + \gamma_1 Gfcf_t + \gamma_2 Opn_t + \gamma_3 Rir_t + \varepsilon_t \quad (2)$$

By apriori expectation, *Fdbt* and its square should impact negatively on growth.

Furthermore, the ARDL representation of equations (1) and (2) is specified in a general vector autoregressive (VAR) model of order *p* in (3) and (4).The preference for ARDL is informed by its applicability when variables are fractionally integrated, and at order zero and one (see Pesaran, Shin & Smith, 2001). Thus,

$$\Delta gr_t = \beta_0 + \beta_1 gr_{t-1} + \beta_2 Fdbt_{t-1} + \beta_3 Fdbt_{t-1}^2 + \beta_4 Gfcf_{t-1} + \beta_5 Opn_{t-1} + \beta_6 Rir_{t-1} + \sum_{i=0}^{P}\gamma_{1i}\Delta g_{t-1} + \sum_{i=0}^{P}\gamma_{2i}\Delta Fdbt_{t-1} + \sum_{i=0}^{P}\gamma_{3i}\Delta Fdbt_{t-1}^2 + \sum_{i=0}^{P}\gamma_{4i}\Delta Gfcf_{t-1} + \sum_{i=0}^{P}\gamma_{5i}\Delta Opn_{t-1} + \sum_{i=0}^{P}\gamma_{6i}\Delta Rir_{t-1} + \varepsilon_t \quad (3)$$

where Δ is the first difference operator, β_0 is the drift component, and ε_t is white noise residual.

The short-run dynamic function or error correction version of (3) is specified as,

$$\Delta gr_t = \sum_{i=0}^{P}\gamma_{1i}\Delta gr_{t-1} \sum_{i=0}^{P}\gamma_{2i} Fdbt_{t-1} + \sum_{i=0}^{P}\gamma_{3i}\Delta Fdbt_{t-1}^2 + \sum_{i=0}^{P}\gamma_{4i}\Delta Gfcf_{t-1} + \sum_{i=0}^{P}\gamma_{5i}\Delta Opn_{t-1} + \sum_{i=0}^{P}\gamma_{6i}\Delta Rir_{t-1} + \varphi ECT_{t-1} + u_t \quad (4)$$

where φ is the speed of adjustment parameter and *ECT* is the residual from expression (3).

Meanwhile, a comparable expression to be estimated in order to capture the effects ofbreaks in respective dates,in line with Perron (1989), is stated as follows:

$$Gt_t = C + D_{1983} + D_{2004} + T + D_{1983}T + D_{2004}T + u_t \quad (5)$$

where *C*is constant, a standard intercept term,*T* represents time in years as the trend variable, while*D* is dummy variable which starts as one for the break date, as well as the subsequent years, and zero for the years before the break. As such, in expression (5), the 1983 dummy is one all through the years from 1983 to 2003 and 2004 dummy is one all through the years from 2004 to 2017.

4. Results and Discussion

The result of the unit root test, as shown in Table 3, accepts the null hypothesis of non-stationarity for all series except foreign debt. The non-stationarity of foreign debt is, however, accounted for by breaks in 1983 and 2004 following the Bai and Perron (2003) methodology result in Table 2, which necessarily informs the specification of equation (5).The stationarity of the segments, as presented in Table 5, implies that the non-stationarity of the series prior to its partitioning, is due to breaks in the trend which may have resulted from change in the foreign debt regime (see Perron, 1989). That is, breaks in foreign debt in 1983 may be ascribed to low revenue from oil sale which necessitates huge borrowing from international agencies for developmental projects in the country. As regard 2004, the change or shock in foreign debt profile or regime may be ascribed to discussions surrounding the sustainability of the country's debt which eventually resulted into debt forgiveness by the Paris and London Clubs in 2005. As such, the anticipation of debt relief contributes to sudden decline in the country's debt profile in 2004. Thus, in comparison to the

baseline long-run result in Table 6, Table 7 presents estimation results for equation (5);the Constant and Trend columns show the values for the baseline estimates, while Constant 1983 and Constant 2004 columns indicate the departure from the baseline. The same logic applies to Trend 1983 as well as Trend 2004. Meanwhile, in Table 6, the non-linear analysis shows insignificant relationships between growth and the square of foreign debt in both short-run and long-run. On the contrary, however, the linear analysis supports the neoclassical, as well as debt overhang theory by establishing a significant inverse relationship between foreign debt and growth in the short-run. Numerically, the result implies that in the short-run, a 100 percentage point increase in foreign debt brings about 10.2 per cent reduction in growth. This short-run result portends the fact that, in the early stage of obtaining foreign debt, economic growth is adversely affected. However, it is not certain whether or not the effect of foreign debt will drive growth in the future. A sure likelihood is that, contemporaneously, foreign debt Granger-causes growth in Nigeria as result shows in Table 4.

Essentially, in comparison with earlier studies, the negative relationship obtained between foreign debt and growth corroborates findings byBaldacci and Kumar (2010), Reinhart, Reinhart and Rogoff (2012), and Mbah, Agu and Umunna (2016). The result, however, contradicts the findings by Ogunmuyiwa (2011), Ibi and Aganyi (2015), Monogbe (2016), and Ewubare, Nteegah and Okpoi (2017). Essentially, the departure of this work from other studies on Nigeria arises mainly from the use of Bai and Perron (2003) methodology. Basically, without the use of Bai and Perron (2003) methodology, the result would have been the same with those of earlier studies that found negative relationship between foreign debt and growth, and as such there would not be reason to go history lane for economic policies that bring about change in foreign debt regime in Nigeria in 1983 and 2004.

Nevertheless, post-analyses diagnostics confirm stable parameters as depicted in Figure 2 where the cumulative sum of recursive residuals (CUSUM) shows that the plots of residuals do not cross the 5 per cent critical lines. Also, Figure 3 shows that residuals do not violate the normality assumption of OLS technique given the Jarque-Berra probability of 0.273455. Moreover, as presented in Table 8, the F-statistic and Obs*R-squared are not significant, thus implying a case of no serial correlation.

5. Conclusion and Recommendations

The relationship between foreign debt and economic growth is further examined in this study over the period 1970-2017 in Nigeria. Essentially, the motivation is to ascertain whether, or not, the country should source for fund through external borrowing in order to revamp the economy from declining growth. As such, in the process, a linear and polynomial relationship between external debt and growth is analyzed. In addition, the average impacts of Gfcf, Opn and Rir are examined. The results reveal Granger-causality running from foreign debt to growth. While non-linear analysis reveals insignificant relationship between growth and foreign debt, the linear analysis on the contrary, establishes that foreign debt is significant but negatively impactful on growth in the short-run. In conclusion thus, an inverse relationship is found between foreign debt and economic growth over the period considered in Nigeria.

The policy implication of the findings is that, since foreign debt impacts negatively on economic growth despite the availability of capital, government should therefore take caution in obtaining the proposed loan from international agencies. By implication, if government obtains more loans from overseas in addition to the current unavoidably large foreign debt, a further stifling of economic growth might occur.

REFERENCES

Adegboyega, R.R. (2018). External debt and economic growth in Nigeria: An ardl approach. *ACTA UNIVERSITATIIS DANUBIUS, AUDOE,* 14(*4*), 581-596

Afonso, A., &Alves, J. (2014). The role of government debt in economic growth. *LISBOA School of Economics and Management Working Paper,* 16, 1-44.

Ajayi, L.B., & Oke, M.O. (2012). Effect of external debt on economic growth and development of Nigeria. *International Journal of Business and Social Science.* 3(*12*), 297-304.

Amaefule, E. (2019, April 5). Nigeria's debt hits N24.39tn, rises by N2.66tn in one year. *The Punch* Retrieved from https://punchng.com/nigerias-debt-hits-n24-39tn-rises-by-n2-66tn-in- one-year/

Amaefule, E. (2019, April 23). World Bank loan portfolio in Nigeria now $8.67bn. *The Punch*Retrieved from https://punchng.com/world-bank-loan-portfolio-in-nigeria-now-8-67bn/

Ameh, J. (2019, April 18). FG seeks fresh $247.3m external loan. *The Punch* Retrieved from https://punchng.com/fg-seeks-fresh-247-3m-external-loan/

Bai, J.,& Perron, P. (2003). Computation and analysis of multiple structural change models. *Journal of Applied Econometrics,*6, 72-78.

Bailey, S.J. (1995). *Public sector economics – Theory, policy and practice*. London: Macmillan.

Baldacci, E.,&Kumar, M. (2010). "Fiscal deficits, public debt and sovereign bond yields."*IMF Working Paper* WP/10/184. Washington, DC: International Monetary Fund.

Barro, R. (1989). The Ricardian approach to budget deficits. *The Journal of Economic Perspectives*, 3(*2*), 37–54.

Barro, R.J. (1996). Determinant of economic growth: A cross country empirical study. *NBER Working Paper*, Department of Economics, Harvard University, Cambridge. Series.

Barro, R.,&Sala-i-Martin, X. (2004). *Economic growth*.Second edition, MIT Press.

Baum, A., Checherita, C.,& Rother, P. (2013). "Debt and growth: New evidence from the euro area." *Journal of International Money and Finance*, 32, 809–21.

Baumol, W. J.,&Maurice, H.P. (1955). More on the multiplier effects of a balanced budget. *The American Economic Review*. 45(*1*), 140–148

Cecchetti, S. G., Mohanty, M.S.,& Zampolli, F. (2011)."The real effects of debt." Federal Reserve Bank of Kansas City, Economic Symposium 2011: *Achieving Maximum Long-Run Growth*, pp.145–96.

Central Bank of Nigeria (2018).Statistical bulletin. Retrieved fromwww.cbn-org/statistics

Chenery, H., & Strout, A. (1966). Foreign assistance and economic development. *American Economic Review*, 56.

Claessens, S., & Diwan, I. (1990). "Investment incentives: New money, debt relief, and the critical role of conditionality in debt crisis." *The World Bank Economic Review*, 4(*1*).

Dickey, D.A., & Fuller, W.A. (1979). "Distribution of the estimators for autoregressive time series with a unit root". *Journal of the American Statistical Association, 74*, 427-431.

Egert, B. (2015). Public debt, economic growth and nonlinear effects: Myth or reality? *Journal of Macroeconomics,* 43, 226–238

Ewubare, D., Nteegah, A., & Okpoi, G. (2017). Public borrowing and the Nigerian economy: An autoregressive distributed lag model (ardl) approach. *The International Journal of Social Sciences and Humanities Invention,* 4(*5*), 3506-3514. DOI: 10.18535/ijsshi/v4i5.07

Gabriel, O. (2016, October 31). World Bank, IMF put pressure on Buhari to come up with economic blueprint. *Vanguard.* Retrieved from www.vanguardngr.com/2016/10/world-bank-imf- put-pressure-buhari-come-economic-blueprint-

Granger, C. W. J. (1969). Investigating causal relations by econometric models and crossspectral methods. *Econometrica* 37, 24-36.

Greiner, A. (2013). Debt and growth: Is there a non-monotonic relation? *Economics Bulletin,* 33 (*1*), 340- 347

Ibi, E.E., & Aganyi, A. (2015). Impacts of external debt on economic growth in Nigeria: A var approach. *Journal of Business Management and Administration.* 3(*1*), 1-5.

Kowalski, E. (2000). "Determinants of economic growth in East Asia: A linear regression model". Research Honours Project, Illinois Wesleyan University.

Krugman, P. (1988). "Financing vs forgiving a debt overhang: Some analytic notes".*Journal of Development Economics,*29, 253-268

Kumar, M.,& Woo, J. (2010). Public debt and growth.*IMF Working Paper,10*(174).

Kwiatkowski, D., Phillips, P.C.B., Schmidt, P.,& Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root. *Journal of Econometrics.* 54(*1-3*), 159- 178.

Mbah, S.A., Agu, O.C., & Umunna, G. (2016). Impact of external debt on economic growth in Nigeria: An ardl bound testing approach. *Journal of Economics and Sustainable Development,* 7(*10*),16-26.

McKinnon, R.I. (1973). Money and capital in economic development. Washington, D.C.: Brookings Institution.

Monogbe, T.G. (2016). Intergenerational effect of external debt on performance of the Nigeria economy. *NG-Journal of Social Development.* 5(*2*), 51-65.

Nweze, C. (2019, April 22). N24.39tr debt: Nigeria not in debt crisis, says Fed Govt. *The Nation* Retrieved from https://thenationonlieng.net/n24-39tr-debt-nigeria-not-in-debt-crisis- son's-says-fed-gov

Ogunmuyiwa, M.S. (2011). Does external debt promote economic growth in Nigeria? *Current Research Journal of Economic Theory,* 3(*1*), 29-35.

Onuba, I. (2019, April 24). Nigeria's N24tn debt still sustainable, FG insists. *The Punch* Retrieved from https://punchng.com/nigerias-n24tn-debt-still-sustainable-fg-insists/

Perron, P. (1989). The great crash, the oil price shock, and the unit roothypothesis. *Econometrica: Journal of the Econometric Society,* pp.1361-1401.

Pesaran, H., Shin, Y.,& Smith, R. (2001). Bound testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(*3*), 289–326.

Phillips, P. C. B.,& Perron, P. (1988). Testing for a unit root in times series regression. *Biometrika* 75, 335-346.

Reinhart, C.M., Reinhart, V.R.,& Rogoff, K.S. (2012). "Public debt overhangs: Advanced-economy episodes since 1800." *Journal of EconomicPerspectives,* 26(*3*), 69–86.

Rivera-Batiz, L. A., & Romer, P.M. (1991). Economic integration and endogenous growth. *Quarterly Journal of Economics* 106(*2*), 531-555.

Saint-Paul, G. (1992). "Fiscal policy in an endogenous growth model." *Quarterly Journal of Economics*, 107, 1243-1259.

Sulaiman, L.A., & Azeez, B.A. (2012). Effect of external debt on economic growth of Nigeria. *Journal of Economics and Sustainable Development.* 3(*8*), 71-79.

Swamy, V. (2015).Government debt and economic growth –Decomposing the cause and effect relationship.*Munich Personal RePEc Archive, MPRA*

Tradingeconomics (2016).Nigeria public external debt. Retrieved from www.tradingeconomics.com/articles/11172015163227.html

Ugwuegbe, S.U., Okafor, I.G., & Akarogbe, C.A. (2016). Effect of external borrowing and foreign aid on economic growth in Nigeria. *International Journal of Academic Research in Business and Social Sciences.* 6(*4*), 155-175. DOI: 10.6007/IJARBSS/v6-i4/2087

Ujah, E. (2017, April 20). World Bank cautions Nigeria against over-borrowing. *Vanguard* Retrieved from https://www.vanguardngr.com/2017/04/world-bank-cautions-nigeria-against- over-borrowing/

World Bank (2018).World development indicator. Retrieved from www.wdi.org/indicator

Zivot, E.,&Andrews, D.W.K. (1992). Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis. *Journal of Business and Economic Statistics* 10, 251-270.

Appendix

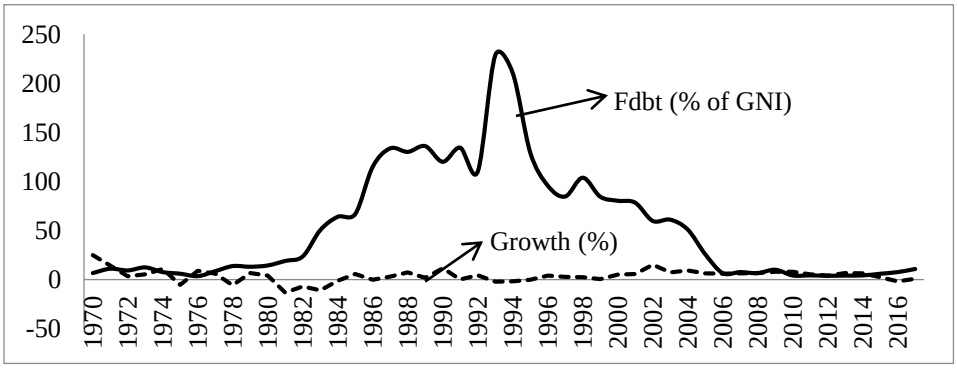

Figure 1: Trends of Growth (%) and External Debt (% of GDP) in Nigeria, 1970-2017
Source: Author's representation using data from CBN (2018) and World Bank (2018)

Table 2: Bai-Perron breakpoint test result

Break test options: Trimming 0.15, Max. breaks 3, Sig. level 0.05

Sequential F-statistic determined breaks:			2
Break Test	F-statistic	Scaled F-statistic	Critical Value**
0 vs. 1 *	2795.585	2795.585	8.58
1 vs. 2 *	68.98526	68.98526	10.13
2 vs. 3	5.851827	5.851827	11.14
Break dates:			
	Sequential	Repartition	

1	1983	1983
2	2004	2004

* Significant at the 0.05 level.
** Bai-Perron (Econometric Journal, 2003) critical values.

Table 3: Unit root tests results

	ADF			PP			KPSS		
Variable	Level	1st Diff	Dec	Level	1st Diff	Dec	Level	1st Diff	Dec
Gr	-5.502	-	I(0)	-5.514	-	I(0)	0.131	-	I(0)
Fdbt	-1.439	-6.294	I(1)	-1.420	-6.294	I(1)	0.195	0.246	I(1)
$Fdbt^2$	-2.103	-	I(0)	-2.004	-	I(0)	0.169	-	I(0)
Gfcf	-5.171	-	I(0)	-5.515	-	I(0)	0.361	-	I(0)
Opn	-4.423	-	I(0)	-4.435	-	I(0)	0.211	-	I(0)
Rir	-6.849	-	I(0)	-6.849	-	I(0)	0.479	-	I(0)

Source: Author's computation

Table 4: Pairwise Granger causality test results

Null Hypothesis	Lag	F-stat	Prob	Decision
FDBT does not Granger Cause GR	1	2.95013	0.0041	Reject
GR does not Granger Cause FDBT	1	1.91441	0.1740	Accept

Source: Author's computation

Table 5: Partitioned segments unit root tests results

	ADF		PP		KPSS	
Segments	t-Stat	Decision	Adj t-Stat	Decision	t-Stat	Decision
1971-1982	-3.744	Stationary	-3.745	Stationary	0.103	Stationary
1983-2003	-6.625	Stationary	-6.625	Stationary	0.164	Stationary
2004-2017	-5.303	Stationary	-5.304	Stationary	0.121	Stationary

Source: Author's computation

Table 6: Results of the ARDL long-run and short-run estimates of equations (3) and (4)

Long-run ARDL estimates: Dependent var: Gr					**Short run estimates:** Dependent var: ΔGr				
Variable	Coeff	Std Error	t-stat	Prob	Variable	Coeff	Std Error	t-stat	Prob
C	0.402	1.335	0.301	0.765	*C*	0.025	0.015	1.675	0.103
Gr(-1)	0.983	0.054	18.11	0.000	Δ*Gr(-1)*	0.099	0.024	10.44	0.024
Fdbt(-1)	-0.003	0.001	-0.296	0.179	Δ*Fdbt(-1)*	-0.102	1.022	-6.171	0.036
$Fdbt^2$*(-1)*	6.091	3.833	0.016	0.987	Δ$Xdbt^2$*(-1)*	5.801	5.632	1.030	0.310
Gfcf(-1)	0.116	3.001	8.425	0.033	Δ*Gfcf(-1)*	0.002	0.002	0.442	0.661
Opn(-1)	0.001	0.001	1.125	0.268	Δ*Opn(-1)*	0.001	0.001	0.938	0.355
Rir(-1)	-0.008	0.001	-3.104	0.037	Δ*Rir(-1)*	1.091	0.001	3.018	0.041
					Ecm	-0.602	0.075	9.364	0.012

Adj R^2	0.875		Adj R^2	0.784	
F-statistic	239.4	0.000	F-statistic	2.958	0.031
DW-statistic	1.776		DW-statistic	1.676	

Source: Author's computation

Table 7. OLS estimation results of equation (5)

Series	Constant	Constant (1983)	Constant (2004)	Trend	Trend (1983)	Trend (2004)
Gt	0.402	0.431	0.407	0.015	0.018	0.006

Source: Author's computation

Figure 2: Graphical illustration of CUSUM

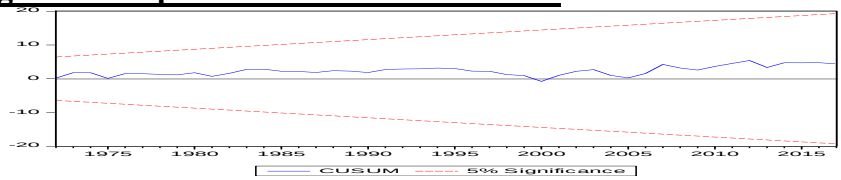

Figure 3: Result of the Normality test

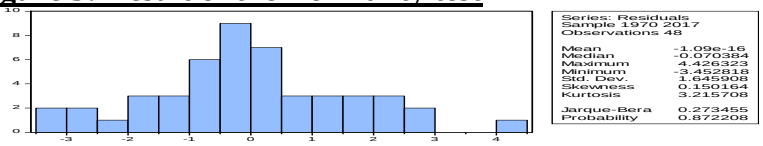

Table 8: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.610572	Prob. F(6,40)	0.5864
Obs*R-squared	2.145591	Prob. Chi-Square(2)	0.3328

Source: Author's computation