Analysing the Incidence of External Debt Stocks and Exchange Rate Fluctuations on Economic Growth in Nigeria

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ABSTRACT

The overdependence of Nigeria on external borrowing to finance capital projects amidst persistent fluctuations in exchange rate had posed challenges for economic growth in Nigeria. This study analysed the impact of external debt stock and exchange rate fluctuations on economic growth. Time series data on the variables were sourced from the world development index and the Central Bank of Nigeria from 1981-2021. The outcome of Zivot-Andrews indicated that all variables were integrated of order I(1), the Johansen cointegration confirmed the existence of long run relationship among the variables. The study found from the analysis of structural VAR that external debt stock and external debt service had significant negative impact on economic growth in Nigeria while exchange rate fluctuations positively impact on economic growth. However, the analysis of the transmission effect revealed that external debt stock negatively affects economic growth through exchange rate volatilities. The study therefore recommended borrowing to finance only capital projects and not recurrent expenditures, and the execution of these projects should be paid in domestic currencies to increase demand for naira.

Key Words: External Debt Stock, External Debt Service, Exchange Rate Volatility, and Economic Growth.

INTRODUCTION

Most economies often depend on borrowing to finance capital projects that has been projected to expand their productive base to drive economic growth with improved welfare and standard of living of the populace. However, developing nations with high external debt profile are often characterised with poor growth rate and depreciating exchange rate; thus, continuous increase in government borrowing amidst exchange rate fluctuations has posed challenges to economic growth in most developing countries across the globe. External debts may be of benefit to different economies but when the accumulation of external debt outstanding is on a high level, then a chunk of government expenditure as well as foreign exchange earnings are channelled towards servicing and repaying the debt with heavy opportunity costs that become detrimental to the growth of the economy which overlaps into future generations (Festus & Saibu, 2019). Though, external borrowing is a major source of finance for financing capital projects and closing budget deficits in the quest to drive development, but excessive external debt outstanding without commensurate foreign reserve create adverse implications on the value of currency and cause poor economic growth.

Nigeria is faced with insufficient capital and often resorted to external borrowing to finance capital projects, which made Nigeria's external debt to be on the increase over the years along with fluctuating exchange rates that seemingly distorted the performance of the economy. By the year 1999 for example, Nigeria's external debt stocks stood at approximately $29 billion and between 1999 and 2004, the external debt stocks had risen to approximately $39 billion whereas at 2006 it dropped to $9 billion due to repayment of the Paris Club debt with the expectation that the resources meant for debt servicing could be channelled towards capital expenditures for enhanced economic growth (World Bank, 2018). However, the narrative of improving economic growth changed as both recurrent and capital expenditures began to rise amidst stolen

funds which saw the external debt stocks circle swollen up from approximately $12 billion in 2007 to a high level of $46 billion in 2018 (World Bank, 2018; and International Debt Statistics, 2019).

During these periods of increasing external borrowing in Nigeria, the indices of exchange rates and economic growth continued to be erratic and detrimental to the health of the economy. The exchange rate in terms of naira against the US dollar was N86.322/US$1.00 in 1999 due to deregulation of the foreign exchange market, the naira currency depreciated to N117.97/US$1.00 as at 2007 and continued to depreciate up to N213.03/US$1.00 as at 2015, the year 2019 and 2020 saw the worse hit of depreciating value of naira currency where naira/dollar exchange was pegged at N307.0/US$1.00 in 2019and the Central Bank of Nigeria deliberately weakened naira currency which traded at N381.0/US$1.00in 2020 (Central Bank of Nigeria, 2020); according to the Central Bank of Nigeria, the weakening of naira currency became necessary in order to unify multiple exchange rates to accommodate pressures from international lending bodies and interested investors. The growth rates on the other hand were unimpressive in real terms where the GDP growth rate in 1999 was 0.58% with an annual change of -2.00%, the GDP growth rate though positive but continued to fluctuate through 2000 to 2003 reaching a poor GDP annual change of -7.98% in 2003; the Nigeria's GDP annual change improved from 2004 amidst incessant fluctuations of negative values reaching a low of 0.29% GDP annual change in 2019, the GDP shrink by 3.62% in the third quarter of 2020 taking Nigeria's economy in to recession (World Bank, 2019; and National Bureau of Statistics, 2020).

It is against the backdrop of continued external borrowing increasing the external debt stocks with fluctuating exchange rates occasioned by poor indices of economic growth that this study is undertaken to analyse the impact of external debt stocks and exchange rate fluctuations on economic growth in Nigeria, and also analyse the transmission effect of external debt stock to economic growth through exchange rate fluctuations.

LITERATURE REVIEW

Theoretical Underpinning

Several theories explained the relationship between external debt, exchange rate and economic growth. This study adopted the dual gap theory and debt overhang theory to analyse the relationship between external debt stock, exchange rate fluctuations and economic growth.

The Dual Gap Theory

The dual gap theory was put forward byHarrod and Domar in 1946. The theory explained that the development of less developed countries like Nigeria is constrained by two gaps, which are domestic savings and the investment required for take-off, and on the other hand, the constraint of export revenues and the imports needed for development. Thus, the analysis of the theory explained that growth and development is a function of investment, and that investment is essentially a product of domestic savings, which more than often is not adequate to finance development given rise to external borrowing to finance investment for economic growth. Even if domestic saving could be raised to achieve the required investment for attaining target growth rate, the foreign exchange needed to import essential capital goods and raw materials would not be there as the domestic savings and foreign exchange are not perfect substitutes of one another. Thus, the higher the domestic savings, it would not make up the deficiency of foreign exchange to import the required capital goods and industrial raw materials more than value of exports, hence the need for export driven economy for a positive exchange rate.

Debt Over-Hang Theory

This theory was propounded by Howard in 1972.This theory is built on the principle that if the level of debt will surpass the country's ability to repay with some probability in the future, estimated debt service

is expected to be a growing function of the country's output level. Therefore some of the returns obtained through investing in the domestic economy are efficiently taxed away by current foreign creditors and the investment made by domestic and new foreign investor is not encouraged. Debt servicing, which includes interest payments and repayments, is likely to be a factual leakage from an indebted country. It only takes large benefit from the domestic economy to be able to allocate to the foreign economy. Therefore, the country declines some outstanding multiplier-accelerator effects. This reduces the domestic country's growing ability in her economy and increases her dependency on foreign debt (Lawal, Bibire, Adegbola, & Johnson, 2016). When debt overhang occur, the indebted economy requires heavy amount of foreign currency for the debt repayment which have implications on the nation's domestic currency and growth.

Empirical Literature

Many studies at different levels of research investigated the relationship between external debt, exchange rate and economic growth both within and outside Nigeria. Other studies focused on external debt as it affect economic growth, others on implications of exchange rate on economic growth while other studies embraced issues of both external debt and exchange rate movements as it affect economic growth. Some of these empirical studies are reviewed below for considerations in this current study.

Ameet, Niaz, Khalid and Muhammad (2019) applied the bounds testing approach to cointegration and error correction modelling to examine the impact of external debt and the volatility of exchange rate on domestic consumption in Pakistan, the study found that volatility of exchange rate, and external debt have long-term relationship with domestic consumption and income, and that exchange rate volatility and external debt have negative impact on domestic consumption in the short run as well as in long run. Taofik and Abdisamad (2020) used error correction model (ECM) to investigate the relationship between the external debt stock and economic growth in Somalia, the result of the ECM showed that external debt stock negatively affects economic growth in Somalia.

Ekperiware and Oladeji (2012) examined the effect of external debt relief on economic growth in Nigeria, the result of the chow test showed that external debt relief caused a structural break in economic growth relationship with external debt in Nigeria. Similarly, Ijirshar, Joseph and Godoo (2016) studied the relationship between external debt and economic growth in Nigeria applying the Johansen hypothesized cointegration approach, they found that external debt had positive impact on economic growth in Nigeria in the long run only while external debt servicing had both long run and short run negative effect on economic growth in Nigeria. On the other hand, Goshit and Terese (2020) used structural VAR to analyse the relationship between exchange rate volatility and economic growth, it was found that exchange rate volatility had a significant negative effect on economic growth in Nigeria.

Research Gap

Most of the reviewed empirics focused on direct impact of external debt on economic growth, and on the other hand, impact of exchange rate fluctuations on economic growth without much attention on the collective impact of external debt stock and exchange rate volatility on economic growth. Also, not much attention in the empirical literature has been given to the transmission effect of external debt stock to economic growth through exchange rate volatility.

This study sought to fill the gap by simultaneously investigating the impact of external debt stock and exchange rate fluctuations on economic growth, and also analyse the transmission effect of external debtstock to economic growth through exchange rate fluctuations.

METHODOLOGY

The study first made use of Zivot-Andrews to check for the stationarity properties of the series and identify structural break periods; the essence of the check of stationarity is to avoid a misleading or spurious

result arising from the data used for the study and serve as a precursor for the choice of methodology for the study. Johansen cointegration was applied to establish long run relationships among the variables of interest. The study basically and most importantly made use of structural vector autoregressive (SVAR) to estimate the effects of external debt stock and exchange rate fluctuations on economic growth, and analyse the transmission effect of external debt stock to economic growth through exchange rate volatility.

Model Specification

In order to estimate the effect of external debt stock and exchange rate fluctuations on economic growth, and analyse the transmission effect of external debt stock to economic growth through exchange rate fluctuations, the study specified its SVAR model in line with the specifications in the study by Goshit and Terese (2020); modifications were made introducing variables of real gross domestic product (rGDP) as a proxy for economic growth, external debt stock (EDST), external debt servicing (EXDS), exchange rate volatility (EXRV) as a proxy for exchange rate fluctuations.

Given the choice of variables for this study, the model depicting functional relationship is specified as:

$$rGDP = f(EDST, EXDS, EXRV) \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 1$$

Equation is transformed into stochastic form specified as:

$$rGDP = \alpha_0 + \alpha_1 EDST + \alpha_2 EXDS + \alpha_3 EXRV + \varepsilon \quad \_ \quad \_ \quad \_ \quad \_ \quad 2$$

From equation 2, α_0 is intercept and α_{1-3} are the parameters to be estimated while ε is the error term. The stochastic equation 2 is transformed into semi log-log leaving variables *EXRV* and *EXDS* since *EXRV* is an already transformed variable while *EXDS* series is in percentages. The logged equation is specified as:

$$LnrGDP = \alpha_0 + \alpha_1 LnEDST + \alpha_2 EXDS + \alpha_3 EXRV + \varepsilon \quad \_ \quad \_ \quad \_ \quad 3$$

Where *Ln* is the natural log.

Thus, the general form of SVAR is specified as:

$$BY_t = \Upsilon + \Gamma Y_{t-1} + \varepsilon_t \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 4$$

where Y_t is an n-vector relevant variable, and Y_{t-1} is the lag; B and ? are n × n matrix, and ? is n × 1 matrix; and $?_t$ is an n-vector serially and mutually uncorrelated, zero mean structural shocks with identity contemporaneous covariance matrix.

The n-vector of relevant variables for this study is specified as:\

$$Y_t = [LnrGDP \quad LnEDST \quad EXDS \quad EXRV] \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 5$$

Equation 5 is a 4×1 row vector of the endogenous variables observed at time t.

To obtain VAR in standard form and normalize the vector Y_t as specified in equation 5, multiply equation 4 by the inverse of *B*. Thus, we have:

$$LnrGDP_t = \partial_{1j} + \sum_{i-1}^{k} \partial_{11} LnrGDP_{t-1} + \sum_{i-1}^{k} \partial_{12} LnEDST_{t-1} + \sum_{i-1}^{k} \partial_{13} EXDS_{t-1} + \sum_{i-1}^{k} \partial_{14} EXRV_{t-1} + \mu_{1t} \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 6$$

$$LnEDST_t = \beta_{2j} + \sum_{i-1}^{k} \beta_{21} LnrGDP_{t-1} + \sum_{i-1}^{k} \beta_{22} LnEDST_{t-1} + \sum_{i-1}^{k} \beta_{23} EXDS_{t-1} + \sum_{i-1}^{k} \beta_{24} EXRV_{t-1} + \mu_{2t} \quad \_ \quad \_ \quad \_ \quad \_ \quad 7$$

$$LnEXDS_t = \tau_{3j} + \sum_{i-1}^{k} \tau_{31} LnrGDP_{t-1} + \sum_{i-1}^{k} \tau_{32} LnEDST_{t-1} + \sum_{i-1}^{k} \tau_{33} EXDS_{t-1} + \sum_{i-1}^{k} \tau_{34} EXRV_{t-1} + \mu_{3t} \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 8$$

$$EXRV_t = \kappa_{4j} + \sum_{i-1}^{k} \kappa_{41} LnrGDP_{t-1} + \sum_{i-1}^{k} \kappa_{42} LnEDST_{t-1} + \sum_{i-1}^{k} \kappa_{43} EXDS_{t-1} + \sum_{i-1}^{k} \kappa_{44} EXRV_{t-1} + \mu_{4t} \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 9$$

Where:

∂_{1j} ,, β_{2j}, τ_{3j}, and κ_{4j} are intercepts;

∂_{11-14} ,, β_{21-24}, τ_{31-34}, and κ_{41-44} are parameters to be estimated

μ_{it} is residual.

$$\begin{bmatrix} LnrGDP \\ LnEDST \\ EXDS \\ EXRV \end{bmatrix} = \begin{bmatrix} \partial_{11} & \partial_{12} & \partial_{13} & \partial_{14} \\ \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} \\ \tau_{31} & \tau_{32} & \tau_{33} & \tau_{34} \\ \kappa_{41} & \kappa_{42} & \kappa_{43} & \kappa_{44} \end{bmatrix} \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \end{bmatrix} \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 10$$

Equation 10 represents the matrix of variable which is on the left hand side, and on the right hand side is the matrix of coefficient and structural shocks μ_t respectively.

Given the structural compositions of μ_{it} and that μ_{it} are the autonomous changes in Y_t in equation 4, then we have μ_t innovation called shocks specified as:

$$\mu_t = \begin{bmatrix} \mu^{LnrGDP} & \mu^{LnEDST} & \mu^{EXDS} & \mu^{EXRV} \end{bmatrix} \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 11$$

Thus, the structural shocks vector is represented as:

$$B^{-1} = \begin{bmatrix} 1 & \partial_{12} & \partial_{13} & \partial_{14} \\ \beta_{21} & 1 & \beta_{23} & \beta_{24} \\ \tau_{31} & \tau_{32} & 1 & \tau_{34} \\ \kappa_{41} & \kappa_{42} & \kappa_{43} & 1 \end{bmatrix} \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 12$$

Once we identify and impose restrictions on matrix B^{-1} in a recursive order in equation 12, is transform to a triangular matrix form and the structural equation is specified in matrix form as:

$$\begin{bmatrix} e^{LnGDP} \\ e^{LnEXST} \\ e^{EXDS} \\ e^{EXRF} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \beta_{21} & 1 & 0 & 0 \\ \tau_{31} & \tau_{32} & 1 & 0 \\ \kappa_{41} & \kappa_{42} & \kappa_{43} & 1 \end{bmatrix} \begin{bmatrix} \mu^{LnGDP} \\ \mu^{LnEXST} \\ \mu^{EXDS} \\ \mu^{EXRF} \end{bmatrix} \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 13$$

Equation 13 will be used to achieve the set objectives of this study, the SVAR equation is useful because, it is applied to identify shocks and trace them out by employing impulse response analysis and forecast error variance decomposition by imposing restrictions on the matrices. The *e*'s on the left hand side in equation 13 are assumed to have zero mean, constant variances, and are serially uncorrelated, but because of the matrix B^{-1} there has to be contemporaneous correlation between innovations thereby estimating the effects of external debt stock and exchange rate fluctuations on economic growth.

Zivot-Andrews Unit Root

The Zivot and Andrews (1992) unit root is useful and most appropriate for this study because it indicates the structural breaks in checking the stationarity properties of the series. The ZA model for intercept, trend, and both labelled as model A, B, and C respectively are specified as follows:

Model A: $$\Delta x_t = \alpha_0 + \alpha_1 + \lambda x_{t-1} + \phi DU_t + \sum_{j=1}^{k} \theta_j \Delta x_{t-j} + \nu \quad \_ \quad \_ \quad \_ \quad \_ \quad 14$$

Model B: $$\Delta x_t = \varphi_0 + \varphi_1 + \lambda x_{t-1} + \phi DU_t + \Phi DT_t \sum_{j=1}^{k} \theta_j \Delta x_{t-j} + \nu \quad \_ \quad \_ \quad \_ \quad \_ \quad 15$$

Model C: $$\Delta x_t = \varphi_0 + \varphi_1 + \lambda x_{t-1} + \phi DU_t + \Phi DT_t \sum_{j=1}^{k} \theta_j \Delta x_{t-j} + \nu \quad \_ \quad \_ \quad \_ \quad 16$$

Where:

DU_t is the dummy variable which indicate the shift in mean that occurs at each possible breakpoint; DT_t is the corresponding mean shift which is the trend variable; x_t and x_{t-1} is the variable of interest and its lag respectively; and a, δ, and φ are the constants of the respective models.

Johansen Cointegration

The Johansen cointegration is employed to estimate the relationships among the variables. The two types of tests for Johansen co-integration which are the trace test and the maximum eigenvalue test are specified in equation 17 and 18.

$$J_{trace} = -T\sum_{i=r+1}^{n} \ln(1-\lambda) \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 17$$

$$J_{max} = -T\ln(1-\lambda_{r+1}) \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad \_ \quad 18$$

Where T is the sample size, n is number of endogenous variables and λ is the largest eigenvalue.

RESULTS AND ANALYSIS

This section focused on the presentation of results and interpretations, it begins with the unit root test using Zivot-Andrews to establish the stationairity properties of the series, the Johansen cointegration test to confirm long run relationships among the variables of interest, and the structural VAR estimates to evaluate the impact external debt stock and exchange rate fluctuations on economic growth in Nigeria.

Unit Root Test

The unit root test using Zivot-Andrews was applied as a precursor for the choice and appropriateness of the techniques used for this study to avoid a case of spurious results. The estimated result of the Zivot-Andrews unit root test is presented in Table 1.

Table 1: Zivot-Andrews Unit Root Test Result

	Level form		First difference form	
	Test-Statistic	Break Date	Test-Statistic	Break Date
lnrGDP	-2.955879	2002	-5.228798*	2000
lnEDST	-3.707925	2005	-5.548436*	2007
EXDS	-4.010996	1997	-6.795320*	2002
EXRV	-4.854501	2002	-6.795320*	2002
Sig. Level	Critical Values			
1%	-5.34			
5%	-4.93			
10%	-4.58			

*Note: * imply stationarity at 5% level of significance.*

Author's Computation using Eviews 10.0

Under Zivot-Andrews unit root test, the null hypothesis of unit root is rejected if the test statistics is less than the critical values at 1% and 5% level of significance and the probability values are not considered because of the inherent structural breaks. Thus, the results in Table 1 indicated that the variables could not perform well at levels where all the variables were not stationary at level but performed better at first difference where all the variables became stationary. Hence, the I(1) integration order of the variables suggest the suitability of Johansen cointegration to confirm the existence of long run relationship among the variables of interest in this study.

Johansen Cointegration Result

Since all the variables of interest in this study exhibited I(1) order of integration, the study estimated Johansen cointegration and presented in Table 2.

Table 2: Johansen cointegration results

H_0	H_1	Test statistics	0.05 Critical Value	Prob.**
Trace test:				
r = 0	r = 1	58.22030*	47.85613	0.0040
r = 1	r = 2	31.36040*	29.79707	0.0328
r = 2	r = 3	6.909560	15.49471	0.5882
r = 3	r = 4	2.000121	3.841466	0.1573
Max-eigenvalue test:				
r = 0	r > 0	26.85990*	25.58434	0.0417
r 1	r 1	24.45084*	21.13162	0.0164
r 2	r 2	4.909439	14.26460	0.7532
r 3	r 3	2.000121	3.841466	0.1573

Source: Author's Computation using Eviews 10.0

Note: * imply rejection of the null hypothesis at the 0.05 level.

From Table 2, both trace test and max-eigenvalue test indicated two cointegrating equations since the null hypotheses of r = 0, r = 1 and r ? 1 were rejected on the basis that their respective test statistic of58.22030, 31.36040, 26.85990, and 24.45084 were greater than their corresponding 0.05 critical values of 47.85613, 29.79707, 25.58434, and 21.13162; which implied that there exist a long run relationship between external debt stock, external debt service, exchange rate volatility and economic growth in Nigeria.

Analysis of Structural VAR Estimates

The structural VAR was applied to analyse the long run impact of external debt and exchange rate volatility on economic growth in Nigeria since the Johansen technique confirmed the existence of long run relationship among the variables of interest in this study. In line with equation 13, the estimated analytical derivatives of the structural VAR were identified and fitted in matrix equation 17.

$$\begin{bmatrix} e^{LnEDST} \\ e^{EXDS} \\ e^{EXRV} \end{bmatrix} = \begin{bmatrix} -284.7145^{*} & 1 & 0 & 0 \\ -307.0012^{*} & -1.754149 & 1 & 0 \\ 2.118827 & 570739.9 & 730787.0 & 1 \end{bmatrix} \begin{bmatrix} \mu^{LnEDST} \\ \mu^{EXDS} \\ \mu^{EXRV} \end{bmatrix} \quad \_ \quad \_ \quad \_ \quad 17$$

The au steric (*) imply statistical significance at 0.05 level.

From equation 17, the variables of concern in line with the set objective of the study were impact of LnEDST, EXDS and EXRV on LnrGDP. The result indicated that the estimated coefficients of LnEDST and EXDS werenegative (-284.7145 and -307.0012, respectively) and statistically significant, which means that external debt stock and external debt service had significant negative impact on economic growth in Nigeria; while on the other hand, the estimated coefficient of EXRV was positive (2118827) but not statistically significant, which implied that exchange rate volatility had positive impact on economic growth in Nigeria, however, the positive impact was not statistically significant to grow the economy. To further provide more insights, the structural shocks impulse response functions were estimated and presented in Figure 1.

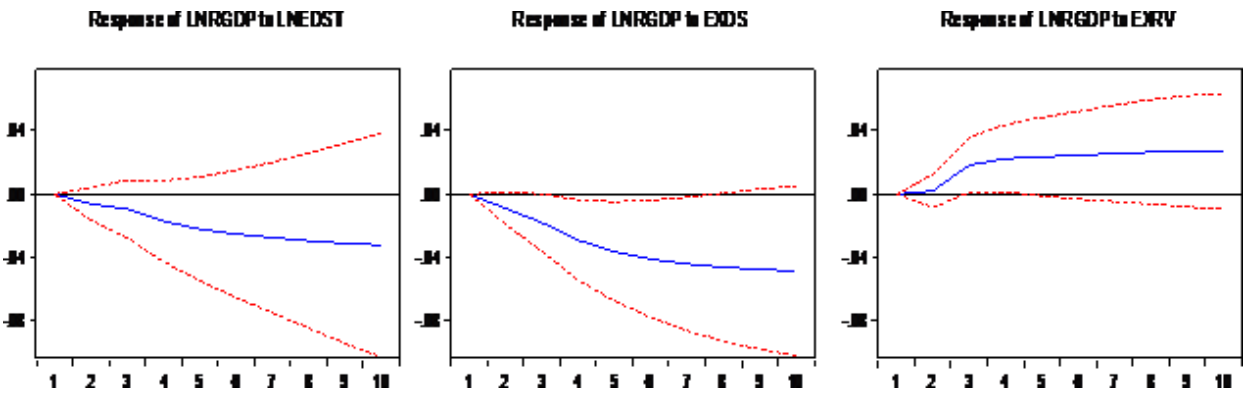

Figure 1: Impulse Response Analysis

Source: Author's Computation using Eviews 10.0

The analysis of the impulse response functions in Figure 1 showed that the response graph of LnrGDP to LnEDST continued to be negative below the asymmetry line on increasing rate throughout the ten year horizon, which implied that increase in external debt stock continue to impact negatively on economic growth in Nigeria. Similarly, the response graph of LnrGDP to EXDS was below the asymmetry showing a continuous negative response through the ten years horizon period, which means that external debt service had negative impact on economic growth in Nigeria. On the other hand, the response graph of LnrGDP to EXRV was positive and above the asymmetry line throughout the ten year horizon, which indicated that exchange rate volatility had positive impact on economic growth in Nigeria.

In order to analyse the transmission effect of external debt stock to economic growth through exchange rate volatility, the study made use of the technique of with and without the variable of exchange rate volatility in the impulse response functions. The outcome of the impulse response is presented in Figure 2.

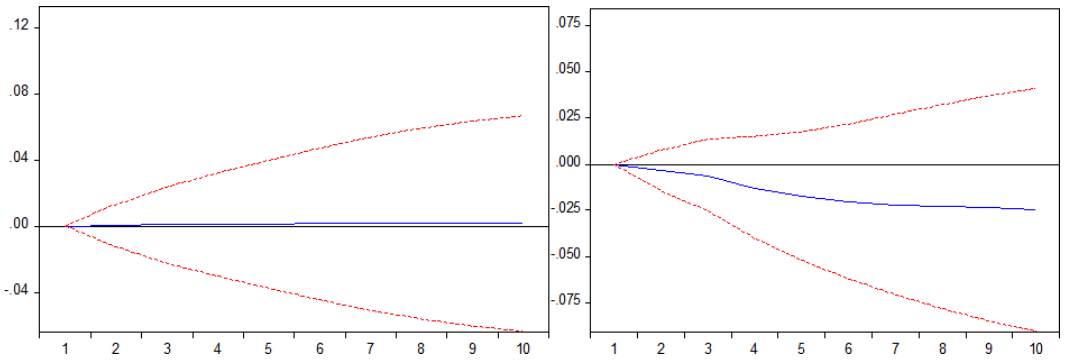

Figure 2: Transmission effect of external debt stock to economic growth through exchange rate volatility

Source: Author's Computation using Eviews 10.0

Figure 2 presented the analysis of pass-through effect of external debt stock to economic growth through exchange rate volatility using the impulse response functions. The left hand side of the impulse response in Figure 2 is a case of response of LnrGDP to LnEDST without incidence of EXRV; the response graph of LnrGDP to LnEDST without EXRV was almost zero lying flat on the asymmetry line throughout the ten year period, while in the case of response of LnrGDP to LnEDST with EXRV on the right hand side was negative and widely below the asymmetry line throughout the period. This analysis in Figure 2 implied

that there exist transmission effect of external debt stock to economic growth through exchange rate volatility, and that the external debt stock negatively impact on economic growth through exchange rate volatility in Nigeria.

Post Test Results

The post-test estimations of serial correlation and heteroskedasticity test were done to confirm the reliability and robustness of the results analysed in this study. The serial correlation and heteroskedasticity were estimated and presented in Table 3.

Table 3: Serial Correlation LM, and Heteroskedasticity Test

Null hypothesis: No serial correlation at lag h					
Lag	LRE* stat	df	Prob.	Rao F-stat	Prob.
1	18.23223	16	0.3105	1.169619	0.3144
2	18.74505	16	0.2821	1.206814	0.2860
Heteroskedasticity Test:					
Chi-sq	df	Prob.			
151.5459	160	0.6714			

Source: Author's Computation using Eviews 10.0

From Table 3, the null hypothesis of no serial correlation could not be rejected since both the likelihood ratio statistic and the F-statistic were both not statistically significant at 0.05 level of significance, which means that the study is free from the problem of serial correlation. Similarly, the chi-square value of 151.5459 was not statistically significant given the probability value of 0.6714, which means that the study could not reject the null hypothesis of homoscedasticity which further implied that there was no problem of heteroskedasticity. The outcomes of serial correlation and heteroskedasticity test confirmed the assumptions in equation 13 that the residuals are serially uncorrelated and had constant variances which by extension implied that the models in this study were correctly specified, hence the results are reliable.

DISCUSSION OF FINDINGS

The findings that external debt stock and external debt service had significant negative impact on economic growth in Nigeria disagree with Ijirshar, Joseph and Godoo (2016). External debt stock and external debt service continue to negatively impact on Nigeria's economy because, Nigeria over the years has been borrowing huge sums of money to finance capital projects without commensurate growth, and this is attributed to the mismanagement of the borrowed funds where the externally borrowed funds are massively siphoned or diverted to even finance recurrent expenditures, which make it difficult servicing the debts. In most cases, the resources that could have been channelled towards growing the economy in Nigeria are used for external debt service since the external debt stock for Nigeria is becoming unbearable.

Also, the finding that exchange rate volatility had positive impact on economic growth in Nigeria was not in line with the finding of Goshit and Terese (2020). This finding of positive impact of exchange rate volatility on economic growth is attributed to the weak value of naira currency where borrowed funds are often in dollars, when changed in to naira, it appeared to increase the resources available in growing the economy, which in real terms does not translate into economic growth. This has been confirmed in the mechanism of the transmission analysis where the pass-through effect exist and external debt stock negatively affect economic growth through exchange rate volatility, which means that the mismanagement

of the much externally borrowed funds had worsened exchange rates of Nigeria's currency leading to the poor growth of Nigeria's economy.

CONCLUSION AND RECOMMENDATION

Based on the findings of this study, the study concluded that external debt stock had significant negative impact on economic growth in Nigeria. The exchange rate fluctuations positively grow the economy but external debt stock negatively impact on economic growth through the exchange rate fluctuations since the externally borrowed funds were often mismanaged. The study therefore made the following recommendations.

1. Successive governments should only be borrowing to finance well planned capital projects and discourage external borrowing to finance recurrent expenditures.
2. Countries that lend to Nigeria through execution of capital projects should be compel to use domestic currencies where there will be increase in the demand for naira currency, hence appreciation in the value of Nigeria's currency, and contribute positively to economic growth.

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