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Impact of Public Debt Servicing on Social Welfare and Economic Growth in Nigeria

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Abstract
Debt plays a significant role in the development of the global economy. Nigeria's debt profile has continued to rise amidst dwindling revenue which has continued to drain the resources meant for capital projects. However, this has put the country at the verge of high debt service risk which could lead to the country's loan default, thus draining its reputation on the global scene. The paper therefore investigated the impact of debt service on poverty reduction efforts in Nigeria. To achieve this objective, Vector Autoregressive technique was employed on time series data for the period 1986 to 2023. Findings from the paper revealed that debt service, debt stock and exchange rate had positive and insignificant impact on poverty in Nigeria. The paper recommended among other policies that government should channel all borrowed funds into productive activities that are investment yielding to accommodate more unemployed people to reduce the incidence of poverty. In addition, the government should endeavor to cut down their rate of borrowing for recurrent spending to reduce the amount of accumulated debt stock in the country. All leakages from the government coffers should be blocked to ensure transparency in the execution of capital projects in the country where investors can leverage on for growth and development.
Keywords: Debt Service, Poverty, Debt Stock, Exchange Rate,

INTRODUCTION

The interdependence of economies has remained a fundamental determinant in the world's economic development or stagnation. As a result of this interplay, both monetary and nonmonetary obligations have been issued. These loans are sometimes accompanied by financial provisions that may or may not result in the country's economic growth and development. Rafindadi and Musa (2018), on the other hand, stated that governments get debt from foreign sources for a variety of reasons, including a lack of income, a budget deficit, or a lack of investment. Said and Yusuf (2018) elaborated that governments borrow primarily for two reasons: macroeconomic reasons or to cover temporary balance of payments deficits aimed at enhancing economic growth and poverty reduction. Debt finance, which affects all countries throughout the world, cannot be overstated

ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

because it has become one of the most effective strategies to bridge the financing gap and ensure economic growth and development. External loans, on the other hand, have continued to climb in Sub-Saharan Africa (SSA), East Asia and Pacific (EAP), and Europe and Central Asia (ECA). According to the World Bank (2017), the ECA accumulated 39.91 percent of external loans as a percentage of total national income in 2006, with the debt profile declining to 36.77 percent in 2008 before rising to 51.41 percent in 2015. In the same way, the SSA's external debt stock fell from 26.88 percent in 2006 to 23.62 percent in 2008, before peaking at 27.99 percent in 2015. In addition, the foreign debt stock for EAP fluctuated between 2006 and 2015, with a low of 12.45 percent in 2011 and a high of 16.34 percent in 2015. Nigeria is blessed with both people and natural resources, allowing the country to generate significant wealth. However, limited budget allocation by various administrations has restricted the utilization of these resource potentials (Udoka & Anyingang, 2010). Due to theft, embezzlement, and corruption in the government, several loans obtained to stimulate economic growth and development have failed to meet their objectives. This has resulted in a high deficit profile in the country, resulting in increased unemployment and poverty rates. As a result, the reality remains that any country's economic growth and development is ascribed to the efficient allocation of scarce resources for developmental initiatives, which has a significant impact on productivity, unemployment, and poverty levels. Nigeria's debt is aimed at avoiding a deteriorating economic scenario caused by rising government expenditures versus falling government revenues, supplementing internal savings for productive activities through infrastructure development, and managing the country's other macroeconomic variables (Ngerebo, 2014). Prior to the late 1970s, Nigeria's debt profile was limited by the country's servicing capabilities. Nonetheless, the global oil glut, along with shocks and a budget deficit, prompted a search for local and international loans to fund growth and development projects (Ajayi & Edewusi, 2020). As a result, Oyedele, David, and Omojola (2016) asserted that Nigeria's debt crisis began in 1978, when the country borrowed from the international capital market at a high interest rate with a short term and grace period. This situation gave rise to suffocation of the available national resources in the country through debt servicing thus, compounding the debt crisis in Nigeria. Total debt and debt servicing as percentage of gross national income in Nigeria has continued to rise correspondingly. Total debt and debt servicing (% GNI) in 1980 was 4.15% and 1.88%, 1990 had 22.06% and 6.52%, 2000, had 8.76% and 2.93%, 2010 had 1.50% and 0.37%, 2018 recorded 8.26% and 1.53% while the rate stood at 21.61% and 3.57% in 2020 (World Bank 2019; International Debt Statistics, 2019, DMO, 2021). The goal of this assistance is to improve productivity in less developed countries, reduce foreign debt, raise people's living standards, and ultimately boost Nigeria's economic growth (Idris & Ahmad, 2017). The rising amount of poverty in emerging countries, such as Nigeria, is one of the key issues they face. Poverty is a global phenomenon that continues to pose a threat to humanity's survival. Poverty in Nigeria is a paradox; it is an instance of poverty in a land where there is plenty. Despite the country's natural and human resources, the poverty rate has been rising for more than two decades, with negative effects for the people's wellbeing. According to the 2010 poverty index, 60.9 percent of Nigerians live in absolute poverty, with the majority of these individuals living in rural regions (National Bureau of Statistics, 2011). A major concern among stakeholders has been the rising trend in poverty levels. Poverty denotes a situation in which

ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

an individual does not have access to the minimal acceptable level of living, whether in a relative or absolute sense (Edom, Inah, Emori & Enya, 2015). Poverty can vary widely in terms of its scope, intensity, and features both within and across countries. Poverty is multidimensional and thus suggests that poverty reduction efforts must be multi– targeted and are expected to show wide and diverse dimensions.

The major demand of the poor is not food but various inputs and facilities that can help them generate income on the basis of their skills and proficiencies. The phenomenal increase in the Nigeria's debt stock has raised concern over its sustainability in terms of servicing the loans through interest payment and repayments of the borrowed funds (Ngerebo, 2014). Consequently, Nigeria has been faced with increasing debts service obligations which imposes considerable pressure on resources available for poverty reduction efforts thereby giving rise to continuous increase in the level of poverty in the country. Yearly, huge resources are committed to meeting debt service in Nigeria, leaving little or nothing in the coffers of the government for poverty reduction efforts in the country. In the light of the above, this research investigates the impact of debt servicing on poverty reduction efforts in Nigeria.

Statement of the Problem

Nigeria is endowed with both people and natural resources that, if properly employed, can act as catalysts for economic growth and development. The potential of untapped human and natural resources has the potential to increase production, allow the establishment of viable and sustainable wealth, employment possibilities, and hence poverty reduction. Since the purchase of public debt in 1958, successive governments have attempted to generate new revenue streams to aid economic growth and development. Increased tariff measures, sales, business and personal income tax increases, and subsidy reduction on petroleum and agricultural have all been part of the revenue mobilization efforts over the years. However, these government revenue streams have remained insufficient. The Nigerian government having identified the insufficiency in the revenue base of the country alongside global agitation for poverty reduction began to source for ways in which savings and investment gap can be covered to boost economic growth and development in the country through wealth creation, employment and poverty reduction. This interest further prompted the sourcing of funds both domestically and externally to support the development efforts of Nigeria's economy. Such sources of funds include loans from International Monetary Fund, World Bank, Paris Club, China, African Development Bank, Eurobond market and the Nigerian money and capital markets which has debt servicing obligations on the country. Despite the acquisition of these funds for the growth and development of the economy at the federal, state and local levels, there has been little or no evidence of growth and development tied to these loans. Evidently, unemployment and poverty levels, income inequality as well as insecurity have continued to rise in the country. According to the National Bureau of statistics (2023), poverty level has been on the rise from 28.1% in 1980 to 34.7% in 1985 and 39.2% in 1992, the situation further increased to 60.9% in 2010. In 2021 and 2022, the Nigeria public debt portfolio stood at N31 trillion and N35 trillion representing an excess debt threshold of 3% with 3.6% to GDP; N13.5 trillion 2021 budget, debt servicing takes 24% which when compared to other sectors allocations is far below (Debt Management Office, 2021). In spite of the vast endowment in the Nigerian economy, and its position as one of

ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

the world's leading producer of oil, the growing debt to GDP ratio has continued to be a serious concern to stakeholders in Nigeria. However, untapped opportunities still exist for revenue generation to be exploited in Nigeria which has the potential of addressing the multi-dimensional issues of poverty.

Given the numerous sources of public debt and the essentials of such resources in the development stride of the country, there is little evidence to show the specific effects they have on poverty reduction in Nigeria. This study assesses the impact debt servicing on poverty reduction efforts in Nigeria from 1986 to 2022.

Objectives of the Study

The broad objective of this study is to examine the impact of debt servicing on poverty reduction efforts in Nigeria. The specific objectives include to:

1. Examine the effect of debt servicing on poverty reduction in Nigeria.
2. Investigate impact of debt stock on poverty reduction in Nigeria.
3. Evaluate the effect of exchange rate on poverty reduction in Nigeria.

LITERATURE REVIEW

Conceptual Clarification

Concept of Debt Service

Debt, in modern law, has no clear set meaning and can be understood fundamentally as something that one person legally owes to another or an obligation to pay money that is enforceable by legal action. Several academics have disputed the subject of debt servicing. Ndemange (2018), on the other hand, defined debt service as the amount of money required to make payments on outstanding loans' principal and interest, bond interest, or maturing debt principal. Debt service is the amount of money required to pay off a debt's interest and principal over a set period of time. It describes a debtor country's timely repayment of the principal and interest components of an existing loan (Ajayi & Edewusi, 2020). According to Lawanson (2014), debt service is the amount of money required to pay principal and interest on ongoing loans, interest on bonds, or the principal of maturing bonds that the government of a given nation pays based on legal contractual commitments as of when they are due. Pattillo and Ricci (2011) define debt service as the amount of money needed to pay off the principal and interest on outstanding loans after they have accumulated. Total debt service, according to Umaru, Hamidu, and Musa (2013), is the percentage of a country's gross annual income required to cover all of its loans and commitments. In essence, debt service is the annual payment to a lender and others of the loan principal, interest (or cost of capital), and sometimes lease payments. Debt service in Nigeria comprises the integration of all debt elements that Nigeria as a country must serve in order to remain relevant in the globe.

Concept of Poverty

Poverty is defined as a situation in which an individual or a household is unable to meet the fundamental demands of life that are believed to be the bare minimum to ensure a person's survival in a particular society. Adequate food, portable water, good shelter, health, education, transportation, work, political, social, and economic freedom, and security are just a few of these essential needs. Similarly, the World Bank (2002) stated that poverty

ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

is defined as an individual's inability to meet a basic level of life. In order to demonstrate the practical element of poverty, the World Bank (2002) looked at certain indices in relation to the aforementioned notion of a minimum level of consumption. Lack of resources, lack of education and skills, poor health, malnutrition, lack of political freedom and voice, lack of shelter, poor access to water and sanitation, shock susceptibility, violence and crime, political discrimination, and marginalization are among these indices. Similarly, the United Nations Human Development (UNHD) used additional indices to quantify poverty in a country, such as life expectancy, infant mortality rate, primary school enrolment ratio, and the number of people per physician (United Nations Development Programme, 2002). Poverty, according to the Central Bank of Nigeria (1999), is a state of mind in which individuals or households are unable to meet their basic needs of food, clothing, or shelter; are unable to meet social and economic obligations; lack gainful employment, skills, assets, and self-esteem; and have limited access to socio-economic infrastructure such as education, health, water, and sanitation, as well as opportunities to improve their well-being. Premised on the universal unacceptability of the definition of poverty, various scholars have discussed the concept, although all of these definitions fall under the umbrella of absolute, relative, or subjective poverty, depending on how the concept is interpreted (Nweze and Ojowu, 2002). Regardless of one's interpretation of its definition, it is the source of a great deal of suffering, ranging from ignorance, starvation, and disease to society and civil conflict. It is divisive and contributes to political and social unrest (Lawrence & Nsikak, 2015). In light of the aforementioned definitions of poverty, this study takes the position that absolute poverty is the bane of Nigeria's social, cultural, economic, and political progress. Thus, the poor in Nigeria are much more concerned about meeting their basic necessities which is the case of absolute poverty than that of relative poverty as it deals with comparison amongst the people's living standard in the society. Hence, poverty in the context of this work is seen as the inability of individuals or households to meet their basic needs or their basic necessities of life as a result of limited financial resources. Such basic needs include food, shelter, clothes, healthcare, education, social, economic and political freedom, safe water and sanitation, transports, absence of vulnerability to shocks, violence and crime, political discrimination and marginalization as these are lacking in Nigeria for a sound and healthy living in almost every Nigerian society.

Theoretical Framework

Overhang Debt Theory

Krugman's (1988) debt overhang hypothesis states that excessive borrowing leads to high indebtedness, debt traps, and a slowdown in economic growth. According to the hypothesis, rising debt levels result in greater taxes (tax disincentives) on future production, crowding out private investment. This means that, as a result of the massive debt stock, potential investors will be discouraged in the expectation that the government will fulfill its debt service obligations by levying high taxes, thereby slowing the country's growth. The importance of debt overhang theory in the context of Nigeria cannot be overstated, especially given the country's debt stock's exponential expansion between 2015 and 2020. However, according to Ayadi & Ayadi (2008), the debt service burden has hampered Nigeria's rapid economic development and exacerbated social problems. The delivery of services by major organizations aimed at improving the living situations of vulnerable people is complicated by

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Journal of Financial Economics and Management

Research Article

deteriorating infrastructure as a result of inadequate funding (Ndemange, 2018). Through missed externalities, the government appears to have limited private sector investment and growth by reducing spending on social and economic infrastructure. Because public investment accounts for a considerable share of total investment in the country, total investment has decreased. According to Lawanson (2014), the theory of debt overhang is founded on the idea that if a country's debt exceeds its ability to repay, with certain chances in the future, expected debt service is likely to be a rising function of the country's output. As a result, a certain level of investment returns in the local sector is essentially taxed away by existing foreign creditors, whereas new foreign and domestic investors are discouraged. This means that debt servicing is an increasing function of a country's output, assuming that the possibility of debt in the future is greater than the country's ability to repay. This inhibits both foreign and domestic investment because investment returns are taxed away in the event of a country's repayment obligation being met. Because governments' ability to implement ambitious reforms such as trade liberalization or fiscal adjustment is limited, investment efficiency may be harmed (Pattillo & Ricci, 2011). This theory is relevant to this study in that Nigeria's debt has been rising thereby increasing the amount of tax imposed on firms. This accumulated debt stock has reduced productive public investment which may transmit into lower growth through declining efficiency and lower investment volumes that could have reduce poverty level through employment opportunities in the country.

Empirical Review

Different scholars have conducted previous research studies on the link between debt and poverty reduction, with varying results. Sansa (2020) investigated the influence of state debt on economic growth and poverty in Tanzania from 2000 to 2018. As a result, the study used a multiple linear regression model to assess the influence of Tanzania's public debt on economic development and poverty. The findings of the analysis revealed that there is a negative and insignificant association between public debt and all of the study's dependent macroeconomic variables (GDP and poverty) in Tanzania from 2000 to 2018. This means that state debt has no impact on Tanzania's economic development and poverty reduction from 2000 to 2018. For policy analysis on public finance and public debt management, Ohiomu (2020) modelled the external debt and economic growth nexus. For strong policy suggestions, the researchers used the group unit root test, auto-regressive distributed lag (ARDL) bounds testing, and co-integrating long-run tests. The debt overhang variable and the crowding-out effect variable both lowered investment levels, according to the findings. This has a negative impact on Nigeria's economic growth.

Rivi, Ogboru, and Rivi (2020) looked at the long-term relationship between Nigerian corruption and debt sustainability from 1996 to 2019. The findings of the study, which used the Vector Error Correction Model (VECM) technique of research, revealed that in Nigeria, corruption is negatively related to debt sustainability, implying that higher levels of corruption render public sector debt unsustainable. The Johansen Co-integration test and the system Generalized Method of Moments were used by Ehikioya, Omankhanlen, Osuma, and Inua (2020) to evaluate the dynamic relationships between external debt and economic growth in 43 African nations from 2001 to 2018. The findings indicated evidence for a long-run equilibrium relationship between external debt and African economic growth. The findings showed that once a specified capacity is reached, the short-run

ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

converges to equilibrium in the long-run, and foreign debt begins to have a negative impact on African economic growth. Ebhotemhen and Umoru (2019) evaluated the impact of external debt on the growth of agricultural production in Nigeria using time series data from 1980 to 2017. The study utilized cointegration and Error Correction Mechanism to investigate the link among variables used. The empirical results revealed that external debt failed to yield increase in output returns in agricultural productivity by its inverse association with agricultural output. This indicated that acquired external loans for agriculture within the period of the study were not optimally utilized for the same resolution. Omodero and Alpheaus (2019) looked at the impact of foreign debt on Nigerian economic growth. The research spanned the years 1997 to 2017. The ordinary least squares regression technique was used to evaluate the data. According to the regression results, foreign debt has a large negative impact on economic growth, whereas foreign debt servicing has a strong and significant beneficial impact. Under this situation, the other elements were insignificant in explaining economic growth. Shahid, Shah, and Sadiqa (2019) used a dataset spanning the years 1984 to 2017 to explore the impact of foreign debt on poverty. The ARDL to co integration approach was used to arrive at the conclusion that foreign debt causes poverty in Pakistan after reaching the debt thresh hold limit and debt overhang point. The analysis discovered a long-run association between debt relief and relief in foreign interest or loan service as a proportion of GNP, Real Gross Domestic Product Growth Rate, Rate of Inflation, Population Growth Rate, and Foreign Investment. The long-term findings of the study revealed that when foreign debt exceeds the minimum threshold limit, the country's poverty level rises. As a percentage rise in foreign debt increases poverty by 42%, another crucial fact is that debt relief in the form of rescheduling and debt payment reduces poverty in the local country by 23.5 percent. In the case of Pakistan, the other control variables RGDPGR, growth rate population (GRP), and foreign direct investment (FDI) improve poverty whereas inflation causes it. According to the study, if debt payment relief is offered, this economic activity will reduce poverty. Ozigbu (2018) looked at the impact of Nigeria's governmental debt sustainability on poverty rates. Stock-Watson Dynamic Least Squares was used to quantify the effects of external debt stock and interest payments on external debt, a proxy for external debt servicing, on poverty headcount (DOLS). External debt stock as a percentage of GNI shows a significant positive link with poverty headcount, with a 10% rise in external debt stock causing a 7.59% increase in poverty headcount, according to the estimated co-integrating regression model. Interest payments on external debt as a percentage of GNI, on the other hand, were found to be inversely connected to poverty headcount.

METHODOLOGY

The analysis included data from the Central Bank of Nigeria's Statistical Bulletin, the National Bureau of Statistics, and the World Bank, which covered the years 1986 through 2023. The data was tested for stationarity using the Augmented Dickey-Fuller (ADF) Unit Root Test, and the Johansen integration approach was used to see if there was a long-run link between the variables. As a result, the Vector Autoregressive (VAR) model was used to study the influence of debt service on poverty reduction efforts in Nigeria. The lack of a co-integration equation among the variables justifies the use of this strategy. The functional model is specified as;

POV= f (DEBTSER, DEBTSTK, EXCR) - - - - - - - - (1)

ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

The functional form of the model was transform into an equation as thus;

$POV = \beta_0 + \beta_1 DEBTSER + \beta_2 DEBTSTK + \beta_3 EXCR + \varepsilon_t$ - - - - - - (2)

Where;

POV = Poverty rate

DEBTSER = Percentage of debt service to GDP

DEBTSTK = Percentage of government debt to GDP

EXCR = Exchange rate ε_t = Error term

β_0 = Constant parameter

β_1–β_3 = Coefficient of the independent variables

A priori expectation

Hypothetically, it is expected that the parameter estimates β_1, β_2 and $\beta_3 > 0$. This implies that debt service, debt stock and exchange rate are expected to be greater than zero. This means that, an increase in debt service, debt stock and exchange rate would lead to an increase in poverty rate in Nigeria. Based on equation (2), the expression of the VAR model is as thus:

$POV_t = \alpha_0 + \Sigma\beta_1 POV_{t-i} + \Sigma\beta_2 DEBTSER_{t-i} + \Sigma\beta_3 DEBTSTK_{t-i} + \Sigma\beta_4 EXCR_{t-i} + \varepsilon t$- - (3)

$DEBTSER_t = \alpha_0 + \Sigma\beta_1 DEBTSER_{t-i} + \Sigma\beta_2 POV_{t-i} + \Sigma\beta_3 DEBTSTK_{t-i} + \Sigma\beta_4 EXCR_{t-i} + \varepsilon t$- - (4)

$DEBTSTK_t = \alpha_0 + \Sigma\beta_1 DEBTSTK_{t-i} + \Sigma\beta_2 DEBTSER_{t-i} + \Sigma\beta_3 POV_{t-i} + \Sigma\beta_4 EXCR_{t-i} + \varepsilon t$ - (5)

$EXCR_t = \alpha_0 + \Sigma\beta_1 EXCR_{t-i} + \Sigma\beta_2 DEBTSER_{t-i} + \Sigma\beta_3 DEBTSTK_{t-i} + \Sigma\beta_4 POV_{t-i} + \varepsilon t$- - (6)

4.0 RESULTS AND DISCUSSION

In this section, presentation and discussion of the estimated results on the impact of debt servicing on poverty reduction efforts in Nigeria was carried out. At first, the descriptive statistics and correlation analysis of all the variables considered in the model was carried and the result is presented in Table 1.

Table 1: Summary statistics

	POV	DEBTSER	DEBTSTK	EXCR
Mean	62.06000	2.542771	32.24686	115.0497
Median	68.00000	1.852000	25.34000	120.5800
Maximum	74.40000	6.521000	74.96000	358.8100
Minimum	42.50000	0.103000	7.280000	1.750000
Std. Dev.	10.55953	2.105640	20.49126	99.78262
Skewness	-0.763594	0.494954	0.795709	0.761914
Kurtosis	2.129238	1.842910	2.444421	2.857511
Jarque-Bera	4.507021	3.381545	4.143528	3.415936
Probability	0.105030	0.184377	0.125963	0.181234

ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

Observations	35	35	35	35
	POV	DEBTSER	DEBTSTK	EXCR
POV	1			
DEBTSER	-0.5600	1		
DEBTSTK	-0.3040	0.5982	1	
EXCR	0.4173	-0.6885	-0.3157	1

Source: Author's computation from E view 10 (2023)

Table 1 provides the descriptive statistics and the correlation matrix of all the variables employed in this study. The outcome showed that all the variables used in the study are normally distributed and hence can be used for the study as shown by the p-values above 0.05 level of significant. From the rule of Thumb, if correlation coefficient is greater than 0.8, we conclude that there is multicolinearity but if the coefficient is less than 0.8 there is no multicolinearity. Overall, the coefficients of correlation between explanatory variables reveal the absence of damaging multicollinearity. This increases our confidence that the results are not distorted by spurious correlations.

Unit Root Test

Prior to applying the co-integration test it is imperative to conduct stationarity test to avoid spurious outcome. Augmented Dickey-Fuller (ADF) was employed and the result is presented in Table 2.

Table 2: Unit root test results

Variable	ADF @ Level	ADF @ First Difference	Order of Integration
POV	-1.486974 {0.5280}	-3.380184 {0.0191}*	I(1)
DEBTSER	-1.723353 {0.4109}*	-6.788254 {0.0000}	I(1)
DEBTSTK	-2.158369 {0.2244}*	-5.251822 {0.0001}	I(1)
EXCR	1.722820 {0.9995}	-3.943887 {0.0047}*	I(1)

Source: Author's computation from E views (2023)

Table 2 showed that POV, DEBTSER, DEBTSTK and EXCR has unit root at level. It was obvious that POV, DEBTSER, DEBTSTK and EXCR had probability values less than 0.05 at level while such p-values became greater than 0.05 at first difference. This therefore, means that all the variables in the study attain constant means and variance after first differencing. Thus, the variables were stationary at first difference.

ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

Lag Length Criteria

The best model for a study must have a lag length that fits the study data. Using the information criteria, lag length results are shown in Table 3.

Table 3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-493.8386	NA	3.83e+08	31.11491	31.29813	31.17565
1	-389.3261	176.3649*	1531408.*	25.58288*	26.49897*	25.88654*
2	-382.0740	10.42495	2786862.	26.12962	27.77858	26.67620
3	-369.1058	15.39969	3861243.	26.31911	28.70093	27.10862

Source: Authors computation from E views (2023)

The best lag period for model estimation is determined by the lag length criteria. As a result, the model's efficacy is evaluated based on the length with the greatest number of criteria. Using the asterisk (*), five criteria were met at lag one: sequential modified LR test statistic (LR), final prediction error FPE, Schwarz information criterion (SIC), Hannan-Qinn and Akaike information criteria.

Johansen Co-integration Test

After determining that the series has unit root features and that the variables are not stationary at the level of the series, it is necessary to do co-integration (Johansen) analysis to determine the long run relationship between the variables. Using the Johansen co-integration method, we may examine this long-run relationship or convergence among the variables that were included in the model. The co-integration test (Johansen) for a long run relationship can be performed by comparing the estimated values of the trace statistic with the critical values for the relationship. Unless the trace statistics above the critical value, the null hypothesis is rejected, indicating that the series are co-integrated; otherwise, the null hypothesis is accepted. The results of the CoIntegration test are provided in Table 4.

Table 4: Johansen Co-integration Result

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value		Prob.**
None	0.529771		47.83428	47.85613	0.0502
At most 1	0.351605	22.93462	29.79707		0.2493
At most 2	0.195532	8.637181	15.49471		0.4000
At most 3	0.043198	1.457246	3.841466		0.2274

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

Hypothesized No. of CE(s)	Max-Eigen Eigenvalue	0.05 Statistic	Critical Value	Prob.**
None	0.529771	24.89966	27.58434	0.1062
At most 1	0.351605	14.29744	21.13162	0.3411
At most 2	0.195532	7.179935	14.26460	0.4681
At most 3	0.043198	1.457246	3.841466	0.2274

Source: Authors computation from E views 10 (2023)

Table 4 shows the results of the Trace and Maximum Eigenvalue tests, as well as their respective values. At the 0.05 level of significance, the results revealed that there is no co-integrating equation present. It can be demonstrated by the fact that none of the Trace and Maximum-Eigen test statistical values is bigger than the critical value for both tests. The series is thus not co-integrated, as demonstrated by the outcomes, and as a result, the series exhibits no long-term relationship with one another. The result of the Johansen experiment influences the selection of VAR.

Table 5: VAR estimated Result: POV

	Coefficient	Std. Error	t-Statistic	Prob.
POV(-1)	0.943524	0.074712	12.62878	0.0000
DEBTSER(-1)	0.592113	0.555202	1.066483	0.2950
DEBTSTK(-1)	0.043165	0.040118	1.075960	0.2908
EXCR(-1)	0.015985	0.010014	1.596298	0.1213
C	-0.274846	5.579567	-0.049259	0.9611
R-squared	0.880504			
Adjusted R-squared	0.864022			
F-statistic	53.42172			
Prob(F-statistic)	0.000000			

Source: Authors computation from E views 10 (2023)

ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

Table 5 summarizes the results of the VAR. From the results, it is observed that poverty level in the previous period positive and significantly impacts poverty rate in Nigeria. Thus, poverty situation in the previous period has the tendency of stimulating poverty growth in the current period. Debt service, debt stock and exchange rate have an insignificant positive impact on poverty rate in Nigeria. This implies that an increase in these variables would worsen the rate of poverty in Nigeria. The intercept of the regression equation demonstrated an inverse impact on the poverty rate in Nigeria implying that without such variables in the equation, poverty rate in Nigeria would decrease. Moreover, the value of R-Square 0.8805 shows high explanatory power of the model. This means that 88.05% variation in poverty rate in Nigeria is attributed to explanatory variables in the model in Nigeria while 11.95% variation in poverty rate in Nigeria is accounted for, by the error/stochastic or other factors not included in the model. Based on the estimated result, debt service, debt stock and exchange rate has joint significant impact on poverty rate in Nigeria for the study period. This is further confirmed by the F-statistic value 53.4217. This shows that debt service, debt stock and exchange rate plays a significant role in the determination of poverty rate in Nigeria.

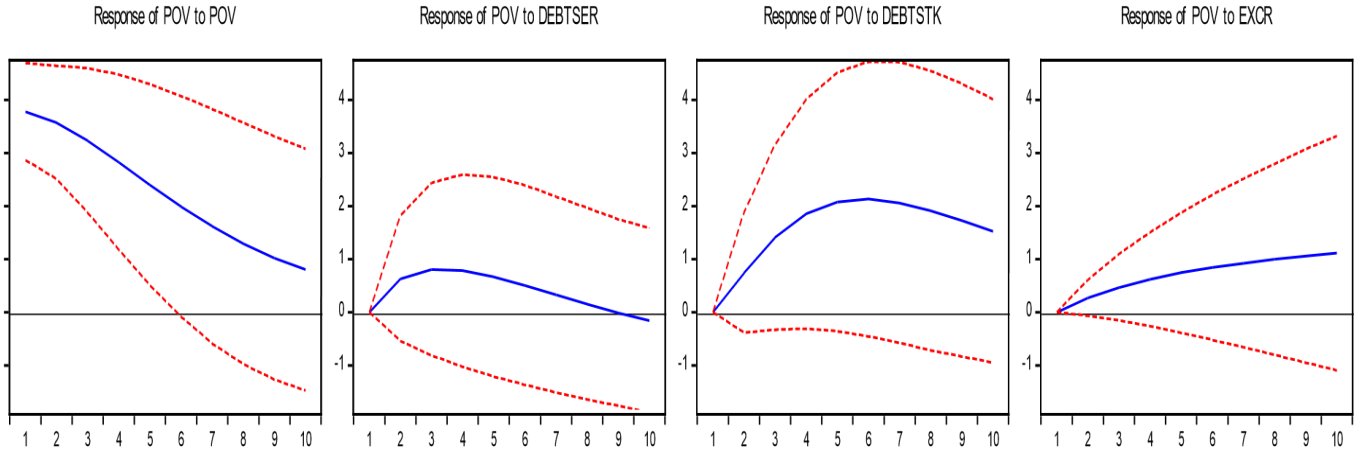

Figure A Figure b Figure c Figure d

Impulse Response Function

The Impulse response function is an econometric technique used to produce the time path of the dependent variables in the VAR model to shocks from each of the explanatory variable. If the system of equations is stable, any shock should decline to zero while an unstable system would produce an explosive time path.

Figure 1: Impulse Response Function

Source: E-views 10.0 (2023)

Figure A, shows the respective response functions of the various explanatory variables with respect to innovational shocks. Figure A shows that shock in poverty rate (POV) brought about a declining but positive effect on itself which amount to a decreasing rate during the period under study. This means that poverty rate

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Research Article

respond positively to itself through the 10 year period. Consequently, a one-unit shock in debt service as shown in Figure B, brought about a positive and decreasing effect on poverty rate except for the 9th year period where debt service becomes negative. Furthermore, Figure C indicated that a positive response of poverty rate was recorded as a result of the change in debt stock from period one to period ten which the response became positive. It was revealed that it's increased at an increasing, constant and decreasing rate through the 10 year period. In addition, Figure D demonstrated that the response of poverty rate to exchange rate is positive and rising for the 10 year period. This situation reflects the rising cost of goods as a result of unstable price of foreign currencies in Nigeria. From the result, it is noted that poverty responds differently to the explanatory variables. The forecast of the study period was made possible through the use of variance decomposition as indicated in Table 6.

Table 6: Variance Decomposition of POV

Period	S.E.	POV	DEBTSER	DEBTSTK	EXCR
1	3.773323	100.0000	0.000000	0.000000	0.000000
2	5.289791	96.37568	1.426089	1.942625	0.255610
3	6.421896	90.66067	2.537621	6.102883	0.698828
4	7.322172	84.58518	3.084824	11.07608	1.253912
5	8.040751	79.02440	3.236503	15.84641	1.892680
6	8.607471	74.28728	3.166242	19.93835	2.608132
7	9.049203	70.38981	2.996829	23.21231	3.401049
8	9.392200	67.22442	2.809093	25.69281	4.273679
9	9.660959	64.64462	2.655087	27.47311	5.227186
10	9.876902	62.50373	2.566859	28.66838	6.261035

Source: Authors computation from E views 10 (2023)

Table 6 showed the result of the variance decomposition of the percentage forecast variance of poverty for ten years that has been explained by the explanatory variables. It revealed that in the first year, poverty in itself is strongly endogenous, while DEBTSER, DEBTSTK and EXCR were weakly endogenous. 100% forecast error variance in poverty is explained by innovative shocks in itself. As such, the contribution of other variables on poverty in the short-run is strongly exogenous. The second year shows that there was a decline in poverty due to decomposed variation, while the other variables DEBTSER, DEBTSTK and EXCR became appreciatively endogenous. Poverty declined to 96.37% while other explanatory variables became strongly endogenous at 1.42%, 1.94% and 0.25% in the second year respectively. As a result, the forecast period indicates that DEBTSERV decline set-in in the 7th period while other variables continued in an increasing trajectory through the 10th period.

Post Estimation Tests

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Research Article

In order to avoid drawing incorrect conclusions about economic phenomena, it is necessary to examine the model's assumptions with respect to the residuals. According to the model's assumptions, the residuals are non-correlated and also possess constant variance across all observations. The result of the post estimation test is presented in Table 7.

Table 7: Post estimation test results

Test	Null Hypothesis	Statistics	P-value
VEC Residual Serial Correlation LM Tests	No serial correlation	0.643877	0.8364
VEC Residual Heteroskedasticity Tests	No Heteroskedasticity	92.11367	0.1672

Source: Authors computation from E views 10 (2023)

Table 7 shows the result of the post estimation test for serial correlation and heteroscedasticity using the VEC residuals test for Serial correlation LM test and VEC residuals heteroscedasticity test. All the null hypotheses of; free from serial correlation/autocorrelation and heteroscedasticity were accepted. This is shown by the probability values of the Roa stat of 0.8364 at the chosen lag one and Chi-square of 0.1672. In this case, all the p-values in Table 7 are greater than 0.05 level of significance used in the study. Therefore, such an outcome reinforces the reliability and robustness of the research results.

CONCLUSION

Debt remains one of the critical infrastructures used in the development of nations of the world as there exist a gap between countries savings and investment. However, these borrowed funds are accompanied by repayment clause binding on the debtors' country. Therefore, the study examined the impact of debt service on poverty reduction efforts in Nigeria for the period 1986 and 2023. Specifically, the study revealed that debt servicing, debt stock and exchange rate increase poverty in Nigeria in an insignificant manner. The incidence of poverty in Nigeria has been aggravated by spiking debt service which leaves little resources for developmental projects which could impact positively on the lives of the citizens in the country. Evidently, debt drains the revenue collection from taxes as a result of huge debt service allocation which has high tendency of crowding out private investment thereby throwing more people into poverty in Nigeria.

RECOMMENDATION

Based on the above, the study recommends that:

1. The government should channel all borrowed funds into productive activities that are investment yielding to accommodate more unemployed people to reduce the incidence of poverty.
2. The government should endeavor to cut down their rate of borrowing for recurrent spending to reduce the amount of accumulated debt stock in the country.
3. All leakages from the government coffers should be blocked to ensure transparency in the execution of capital projects in the country where investors can leverage on for growth and development.

4. The monetary authority should ease out foreign currency regime management to allow for the stabilization of the currency by the market forces. This would help in avoidance of different windows' sales of the foreign currencies.

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