

EFFECTS OF DEBT SERVICING ON ECONOMIC DEVELOPMENT IN NIGERIA

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Abstract

This study examined the effect debt servicing on economic development in Nigeria. The objective is to determine the effect of external and domestic debt servicing on per capita income of Nigerians. Secondary data were sourced from Central Bank of Nigeria (CBN) statistical bulletin and Debt Management Office (DMO) from 2001 to 2020 (period of 20 years). The statistical tool used for data analysis was multiple regression method. The result of test of the hypothesis revealed that debt (external and domestic) servicing has an insignificant effect on per capital income in Nigeria in the short-run, while in the long-run debt (external and domestic) servicing has a significant effect on per capital income in Nigeria. This proves the point that debt as a means to finance fiscal policies of the government are better used for capital expenditure which are probable to affect long term economic plans like infrastructure-financing that spurs productive capacity of citizens and their income in the long run. Based on the finding, the study recommends that, the Nigerian government should ensure that more debt finance should be channeled towards infrastructure development in order to stimulate more short term impacts of the borrowings on the income of Nigerians against the backdrop of short term burden, debt servicing payments pose on per capital income, since it leaves little funding available for recurrent expenditures that are short term stimulants of economic growth and income of citizens

Keywords: External debt, domestic debt, Debt servicing, Per capita income, Economic development.

Introduction

The amount of capital available in most developing countries treasury is grossly inadequate to meet their economic growth needs mainly due to their low productivity, low savings and high consumption pattern. Governments therefore resort to borrowing from outside the country to bridge the resource gap (Ayadi & Ayadi, 2008). Debt servicing is the cost of meeting interest payments and regular contractual repayments of principal on a loan along with any administration charges borne by the borrower (Lowes & Davies, 2005). The Debt Management Office (DMO) revelation shows that the total public debt stock rose from N42.84 trillion recorded in second quarter to N44.06 trillion in third quarter of 2022, indicated a 2.85% increase quarter-on-quarter, while the country acquired a N1.22 trillion debt

within three months. In a breakdown, the DMO said the total public debt stock consists of domestic debt of N26.92 trillion and external debt of N17.15 trillion. Total public debt stock which comprises the total domestic and external debt stock of the Federal Government of Nigeria, all States' governments and the Federal Capital Territory stood at N44.06 trillion (DMO, 2023). The resort to borrowing by the state governments stems from their inability to generate enough revenue internally, a situation that was made worse by shocks from COVID-19 pandemic, insecurity, and of course climate change. Most of the states still depend on federal allocations to fund their budgets, as their internally generated revenue remains perennially weak. Unfortunately, with the dwindling revenue of the Federal Government, the situation is getting worse by the day.

One of the key macroeconomic objectives of a nation is the achievement of sustainable economic growth. To achieve this goal, every Government requires a substantial amount of capital finance through investment expenditures on infrastructural and productive capacity development (Usman *et al.*, 2011). Consequently, this facilitates the growth of their gross domestic product, which if persistent should culminate in economic development, a status vigorously pursued by all less developed countries (LDCs), Nigeria inclusive. Countries borrow to promote economic growth and development, by creating conducive environment for people to invest in various sectors of their economies (Usman *et al.*, 2011). Similarly, Were (2001) argues that the specific reasons why countries may borrow include: to be able to finance their reoccurring budget deficit, as a means of deepening their financial markets, to enable them fund the increasing government expenditures, to enhance their narrow revenue sources and low productivity which results in poor economic growth. Public debt is used as a vital tool by the government to control exchange rate, inflation, among others. Since it forms a major part of the total credit supply of the economy. The appropriateness of public borrowing depends on the purpose for which the fund will be used and the conditions the funds are subjected to. Spilioti (2015) posits that government sometimes borrows internally to fund capital expenditure programmes. This study used external and domestic debt to form part of the model. There are many publications issued on GDP per capita and its relationships with population, land area, transparency score, transparency ranking etc. The publications have been scanned in a way to see if the findings of this study are in conformity with the extant literature in this field. GDP per capita being the (dependent variable) in this study and its relationship with external debt, domestic debt and total debt (the independent variables) were analyzed to see if it would be a supporting study article in this field.

The oil boom era of 1970s coincided with the formulation of Second Development plan of 1970-1974. The oil boom provided much needed financial resources to fully implement the development plan. This period further ushered in large scale public

expenditure by different tiers of government in Nigeria. During this period the Nigeria economy witnessed a tremendous increase in public expenditure in the provision of basic and social infrastructure. But with the collapse of oil prices in 1980s and with attendant consequences on public expenditure, Nigeria faced serious financial challenges and downward trend in government revenue. This situation is so serious that the government has to resort to external borrowing in order to finance public expenditure (Nworji *et al.*, 2012). This structural deficiency already associated with the economy in terms of the pattern and trends of production, consumption and exchange of the Nigerian currency, serves as a barrier for the country's development in most of the vital sectors of the economy. In the efforts to sustain the level of consumption and investment trends, massive importation of commodities continues unabated and far exceeds exports and to ensure fiscal balances, government have to resort to external debts. There has been increased concern regarding prudential use of borrowed fund and the management of public debt. The country's debt profile is also growing at an exponential rate without a concomitant report that gives detail on how these funds were expended. To capture the contemporary Nigerian economic situation where public expenditure is financed greatly by debt, there is need to look beyond just the GDP as a measure for economic development but to also explore the debt servicing expenditure, so as to ascertain the effect of debt servicing expenditure on economic development in Nigeria with a cogent look at the debt profile and how it has influenced the Nigerian economic development. To achieve this, the study will modify the already existing model explored by previous authors by the use of per capita income as a proxy for economic development.

Predicated on these issues, the researchers formulated the following hypothesis in its null form to guide the investigation:

***H₀*:** Debt servicing (External debt and Domestic debt) has no significant effect on per capita income in Nigeria.

The paper is organised as follows' the next section reviews relevant literature with regards to context justification and provide a theoretical background for the study, respectively. Next describes the sample data and empirical methodology. The last section summaries the main results, offers conclusion and recommendations.

Review of related literature

Conceptual Reviews

Public expenditure

Public sector expenditures are the costs that are usually incurred by the government for the provision and maintenance of itself as an institution, the economy and society. The explosion of empirical studies on the endogenous models led to the division of public expenditure into productive and consumption items with cogent look at public sector performance (Barro, 1990). The productive expenditure is assumed to be positively correlated with economic growth while the consumption expenditure is assumed to be negatively related to growth. However, there is no consensus yet in the literature about which public expenditure is productive or unproductive (Musgrave, 1997). After independence in 1960, Nigeria government encouraged both local and foreign investors to be actively involved in the development process in Nigeria through the massive provision of basic social infrastructures, so as to kick-start the development of the country (Ismail & Imoughele, 2015). The oil boom period witnessed a tremendous increase in public expenditure in the provision of basic and social infrastructure. In the efforts to sustain the level of consumption and investment trends, massive importation of commodities continues unabated and far exceeds exports and to ensure fiscal balances, government have to resort to external debts. Thus, government's expenditures continue to rise far more than revenue and this resulted to overvaluation of domestic currency and unemployment becomes more pronounced. Public expenditure experienced an upsurge in the last three decades which can be largely be attributed to huge receipts from the production and sale of crude-oil and with the need to provide basic infrastructure like roads, power, education, health and security. The statistics made available from central bank of Nigeria shows that total expenditure (both capital and recurrent) and its components have moved N14,968 million in 1980 to N60,268.20million in 1990 and rose to N3,452,990million in 2009. In the same vein, the composition of recurrent expenditure shows that expenditure on its various components further showed that public expenditure have increased over the years.

Per capita income and economic growth

Per capita income measures the level of total output in a nation in respect to its total population. This measures the individual income capacity of a nation. Since the independence of Nigeria in 1960, the average growth rate of its per capita GDP has been 1.7 percent per year. The stability of the country's economic growth is an indication that the country is very close to its long-run steady balanced growth path. This evidently shows the absence of trends in its capital-output ratio and its real interest rates. The average real GDP per capita was about US\$ 1222 between 1950 and 1959. The amount rose to US\$1477 under the regime of the country's first president. The GDP per capita reached a peak of about US\$1804 on average between 1976 and 1979 during the military period of Olusegun Obasanjo. After the Obasanjo's military regime, the declining trend of average real GDP per capita was

observed. Prior to the adoption of 1986 Structural Adjustment Programme (SAP) in the country, the average per capita was almost US\$ 1544 between 1960 and 1985. However, a decline in real GDP per capita was experienced after the SAP era. The real GDP per capita on average stood at US\$1446 when the country was under the military regime. Since the adoption of a democratic system in the country, there was an improvement in the real GDP per capita. This reflects the positive effect of democracy on the economic growth identified in the literature. Under normal circumstances one can expect that, *ceteris paribus*, the higher the population the lower the GDP per capita (Inimino, Tubotamuno & Shaibu, 2017).

GDP per person is an informative indicator of welfare across a broad range of countries. There are economically important differences between GDP per person and consumption equivalent of welfare (Fatima, Zina & Abdelaziz, 2014). One might expect that the higher the economic growth rate the higher the GDP per capita since growth is an economic catalyst for higher GDP (Edame & Nwankwo, 2016). However, it is noteworthy that we used both GDP per capita and GDP growth in our models to estimate the country's income inequality. This is because it is believed that GDP growth and GDP per capita can explain the country's economy from different perspectives (Chude & Chude, 2013). The average growth rate per capita real gross domestic product (GDP) from 1960 to 1985 is not significantly related to the 1960 value of real per capita GDP; the correlation is 0.09 (Barro, 1991).

The Nigerian economic growth road map

Prior to the Nigeria independence, the British ruled the country for almost 100 years in order to exploit abundant natural resources needed to sustain its empire. The colonial authorities provided basic infrastructure and services required to boost the exportation of raw materials to Britain (Oyinbo, Zakari & Rekwot, 2013). Owing to the interest of the colonialists, agriculture and trade were used as the drivers of the colonial economy. They put in places several measures to stimulate the production of industrial raw materials such as palm oil and kernels, cocoa, cotton, groundnut and rubber. Oyinbo *et al.*, (2013), observed that the rise in export demand triggered the production of other major agricultural products such as cocoa, groundnut, cotton, and rubber. During this colonial era, the main source of the foreign exchange earnings was the trade in the major agricultural commodities. The promotion of major agricultural goods for export led to the problem of food insecurity as the production of food crops was handled by farmers who generally worked on small plots of land with inefficient traditional technologies. Another important economic activity during the colonial era was the exploitation of mineral resources like coal, tin, columbine, petroleum and gold. The British colonialists managed the gold mining activities while other minerals were left to the private foreign companies. Their economic interest prevented the promotion of industrial activities especially manufacturing with the aim of protecting the market for the products from their

home country. The stability of the country's economic growth is an indication that the country is very close to its long-run steady balanced growth path. The real GDP per capita on average stood at US\$1446 when the country was under the military regime. Since the adoption of a democratic system in the country, there was an improvement in the real GDP per capita. Also, the highest annual growth rate of Nigeria's GDP per capita was observed between 1999 and 2007. The least growth rate in the country was attributed to the period before the democratic system of government (Dauda, 2011).

Economic development plan in Nigeria

Development planning in Nigeria is broadly grouped in three periods. These are the period of Fixed-Term Planning (1962-1985), the Era of Rolling Plan (1990-1998) and the New Democratic Dispensation (1999 till date). The fixed term planning is subdivided into four successful plans namely the First National Development Plan (1962-1968); the Second National Development Plan (1970-1974); the Third National Development Plan (1975-1980); and the Fourth National Development Plan (1981-1985). The first plan was extended to 1969-70 due to the civil war and made a provision of N2.2 billion for capital expenditure. During this plan, the National Manpower Board was established as employment promotion scheme in 1962. The second plan had a capital expenditure budget of about N3billion, all stakeholders were engaged in this era. The third plan started with a capital expenditure of N30 billion and later revised to N43.3 billion. The actual amount spent by the government was N29.43billion with the goal of improving people's welfare. Under this plan, the local governments were involved in its design and formulation. The first rolling plan (1990-1992) was to evaluate the achievement made in implementing SAP and address the challenges confronting the economy. The key priority was to strengthen the National Directorate of Employment. The second rolling plan (1993-1995) aimed to address the observable lapses and inefficiencies in the operation of monetary and credit instrument, low level of capacity utilization of industries and the rising trends of unemployment. The 1994/96 and the 1997/99 Rolling plans aimed at generating employment as its key priority; and building a strong, virile and broad-based economy with adequate capacity to absorb externally generated shocks. All in all, the study presents the facts in relation to the economic growth in Nigeria over time with the aim of providing answers to the research question on what are the growth patterns experienced by the country? Second, it examines the extent by which Nigeria lags in catching up with other countries in a developing region, as well as identifies the drivers that hinder or enhance economic growth. Third, it also considers the influence of the political regimes witnessed in the country has on the level of its economic performance.

Public debt and economic growth

Public debt is defined as the accumulated total of government borrowing from either the private sector of the country or from abroad (Mayo, 1996). Public debt can be used to regulate the economy through variations in the volume, composition, and yield rates of such debt, (Stella, 2015). A long-term maturity composition of public debt will reduce total liquidity in the economy while in opposite direction, a short-term maturity will increase liquidity. Public debt is used as a vital tool by the government to control exchange rate, inflation, etc. since it forms a major part of the total credit supply of the economy. Public debt is a vital alternative source of borrowing. The appropriateness of public borrowing depends on the purpose for which the fund will be used and the conditions the funds are subjected to. One of the key macroeconomic objectives of a nation is the achievement of sustainable economic growth. To achieve this goal, every Government requires a substantial amount of capital finance through investment expenditures on infrastructural and productive capacity development (Usman *et al.*, 2011). Consequently, this facilitates the growth of their gross domestic product, which if persistent should culminate in economic development, a status vigorously pursued by all less developed countries (LDCs), Nigeria inclusive. However, Ayadi & Ayadi (2008) noted that the amount of capital available in most developing countries treasury is grossly inadequate to meet their economic growth needs mainly due to their low productivity, low savings and high consumption pattern. Governments therefore resort to borrowing from outside the country to bridge the resource gap.

Countries borrow to promote economic growth and development, by creating conducive environment for people to invest in various sectors of their economies (Usman *et al.*, 2011). Similarly, Were (2001) argued that the specific reasons why countries may borrow include: to be able to finance their reoccurring budget deficit, as a means of deepening their financial markets, to enable them fund the increasing government expenditures, to enhance their narrow revenue sources and low productivity which results in poor economic growth. A lot of empirical studies support that there is a negative relationship between public debt and economic growth in advanced and emerging economies. According to their empirical results this correlation is particularly strong when public debt reaches 100 percent of GDP (Kuman & Woo, 2010). For developing countries the empirical evidence, particularly for economies belonging to the West Africa, is very limited, and most of them examined the impact of fiscal variables (such as government debt, taxes) on long term interest rates and spreads only as an indirect approach affecting economic growth. Among the studies that examined the impact of debt on GDP growth, is that of Were (2001) which makes an evaluation of the effect of taxes on capital stock, and reached the conclusion that public external and internal debt reduces the available lifetime consumption of tax payers as well as their savings, and thus the capital stock.

Theoretical framework

Wiseman-Peacock hypothesis

This hypothesis was propounded by Wiseman and Peacock (1961) resulting from their study of public expenditure in the United Kingdom for the period 1890-1955. They argued that public expenditure does not increase in smooth and continuous manner, but in jerks or stepwise fashion, favoring a post-ante analysis of direction of causality on the budgets of government. They submitted that some social or additional instability happens making the call for public expenditure to be increased, which the current public revenue will not be enough to meet. The effect of each social disturbance or crisis is to shift the electorate's perception of tolerable taxation to new heights with willingness to tolerate greater tax burden, which finances an expanded scope of government. However, Ezirim (2005) submitted that latter in the study period, and up to the time of Wiseman-Peacock study in 1961, the pressure increased and caused an upsurge in public expenditure in such a way that the resulting effect was the apparent exposure of the inadequacy of the present revenue to every economic watch and analysis. The development was a kind of revenue-expenditure spiral, which, in turn, affected economic activities in a country. They observed that government likes to spend money, while citizens do not like to pay taxes, and concluded that government needs to pay more attention to the wishes of their citizens. In their presentation, the individual voter is conceived as "a free rider" who likes to enjoy the benefits of public goods and services without willing to pay for them through taxes. However, as the economy grows, tax revenue also grows at constant rate, thereby enable public expenditure to grow proportionally with GNP (Agiobenebo, 2003).

The endogenous growth theory

Chude and Chude (2013) submitted that the major improvement in the endogenous growth theory over the previous models is that it looks at the determinants of technology. That is, it explicitly tries to model technology rather than assuming it to be exogenous. This is a statistical explanation of technological improvement that incorporated a new idea of human capital, knowledge and skills that enable workers to be more productive. More often than not, economic growth comes from technological progress, which is fundamentally the ability of economic agents to utilize their productive resources more effectively over time, through the process of learning. This is because human capital development has a high rates or increasing rates of return. Therefore, the rate of growth depends to a large extent on what (the type of capital) a country invests in. Thus, to achieve economic growth, public expenditure in human capital development especially expenditure on education must be increased. At the same time, the theory predicts positive externalities and spillover effects from development of a high valued-added knowledge economy,

which is able to develop and maintain a competitive advantage in growth industries in the overall economy.

Empirical review

Omodero (2019) assessed the impact of government general spending on human development in Nigeria from 2003 to 2017. The purpose of the study was to determine the response of human development index (HDI) to recurrent and capital government expenditures. In order to achieve that objective, the multiple linear regression analysis was employed, while Ordinary Least Square method was used to analyze the model. The study results indicated that government's capital expenditure and inflation have insignificant negative influence on HDI, corruption does not have any impact on HDI but government recurrent expenditure has strong and significant positive impact on HDI. The study concludes that resources on recurrent expenses should be reduced while more money should be invested in capital projects for human capital development in Nigeria.

Panagiotis (2018) investigated the relationship between economic growth and several factors (investment, private and government consumption, trade openness, population and government debt) in Greece, where imbalances persist several years after the financial crisis using a time series analysis and multiple regression. The results of his study revealed a long-run relationship between variables. Investment as private and government consumption and trade openness affect growth positively. On the other hand, there is a negative long-run effect of government debt and population on economic growth. Furthermore, the study addressed the issue of break effects between government debt and economic growth. The results indicate that the relationship between debt and growth depends on the debt breaks. Specifically, at debt levels before 2000, increases in the government debt-to-GDP ratio are associated with insignificant effects on economic growth. However, as government debt rises after 2000, the effect on economic growth diminishes rapidly and the growth impacts become negative. The challenge for policy makers in Greece is to halt the rising of government debt by keeping a sustainable growth path. It was recommended that fiscal discipline should be combined with the implementation of coherent, consistent and sequential growth-enhancing structural reforms.

Mittahu and Roshi (2017) in their study examined the relationship between public spending and economic growth in Nigeria. They explored the relationship between government expenditure and economic growth with the view to establishing a stable relationship. They employed an ARDL model in order to provide the framework for estimating the existence or otherwise of the equilibrium relationship among the examined variables. The empirical findings from their work revealed the existence of positive and significant relationship between public spending on economic growth in Nigeria. They posited that, government expenditures are considered to be highly important in creating opportunities and widening the productive base. As a

result of their findings, they opined that government as an institution that provide welfare to the populace has a major role to play in deciding where priority spending should be allocated in order to enhance the developmental process and provide sustainable growth in the growing economy.

Bonmwa, and Ishmael (2017) in their work examined the impact of government expenditure on economic growth in Nigeria for the period 1981–2016. They split government expenditure into recurrent and capital expenditures which were tested using two separate models. The stationarity of the variables were tested to determine the stochastic properties of the series. Also, the co-integration result indicates that the two models each have one co integrating equation. An ordinary least square technique with error correction specifications was used to analyze the data. The result for the ‘model 1’ indicates that the coefficients of social and economic services were negative while administration was positive and significant. The result for the ‘model 2’ indicates that coefficients of administration and social services were negative and insignificant, while economic services were positive but insignificant. The study then concluded that government expenditure has not translated into meaningful economic growth. On this basis, they recommended that government should increase her budgetary allocation to capital projects and ensure effective utilization of such funds. Also, it should increase social services capital expenditure allocation bearing in mind its multiplier effects on long-run economic growth.

Kalu, Ukai, Chucku and Amadi (2016) examined the impact of Debt Service Payment (DSP) on economic growth for the period 1981 to 2013 using empirical evidence from Nigeria. The ordinary least square regression method and the Granger Causality Test were used as principal methods of estimation in addition to other descriptive statistical tools adopted. DSP proved to be a positive and significant function of economic growth while the causality tests showed a bidirectional causality running for DSP to GDP and a feedback from GDP to DSP. This goes to show that Debt weight evidenced by the quantum of servicing payment by the government limits growth in Nigeria and other economies alike.

Mbah, Agu, and Umunna (2016) investigated the impact of external debt on economic growth in Nigeria by using the ARDL bound testing approach to co-integration and error correction models for the period 1970 – 2013, in order to investigate the existence of long-run equilibrium relationship among the variables. The result of their study indicates a long-run relationship among the variables. External debt impacts negatively and significant on output. The finding also established unidirectional causality between external debt and economic growth. Consequently, the study recommends that government should embark on prudent borrowing and encourage export-oriented growth.

Mohsen, Mohsen and Sadeq (2016) examined the nonlinear relationship between inflation and government spending using quarterly data over the period of 1990-2013, by using Smooth Transition Regression Model. Results suggested a two regime model by using inflation, government expenditure growth, GDP growth and liquidity growth. Lag of liquidity was recognized as transition variable. This study showed that in regime of tight money or low growth of liquidity, government expenditure is not inflationary. In regime of low growth of liquidity, this variable has low inflationary impact and probably stimulates economic growth. Inflationary expectations in first regime are more effective in causing short run inflation. In expansionary regime, increase of money supply has more effects on inflation rather than production. So monetary and fiscal policies could be used to control inflation and stimulate aggregate demand in low regime. Also in easy money regime, monetary and fiscal discipline can be useful for deflation.

Nwanne and Eze (2015) investigated the relationship between external public debt servicing and receipt and exchange rate fluctuations in Nigeria from 1981 to 2013. The variables used in the study included external public debt receipts, external public debt servicing, and exchange rate. The theoretical models adopted in the study were the monetary model of exchange rate determination and the monetary approach to international capital movements. The strategies for accomplishing stated objectives were specified to include the use of Ordinary Least Square (OLS) multiple regression and co-integration test, which would have helped in determining the short-run and long-run relationships, respectively, between the specified variables, based on secondary data sourced from Central Bank of Nigeria (CBN) and Debt Management Office (DMO) statistical publications for the period under review. The findings of the study showed that external debt receipts and external debt servicing have positive short and long-run relationships with naira exchange rate fluctuations. Adesola (2009) in his study reviewed and analyzed the effect of external debt service payment practices on sustainable economic growth and development with particular emphasis on Nigeria. They used debt payment to Multilateral Financial creditors, Paris club creditors, London club creditors, Promissory notes holders and other creditors (Non-Paris Creditors) as variables to statistically determine whether they have inverse relationship with gross domestic product (GDP) and gross fixed capital formation at current market prices (GFCF). Data pertaining to 1981 through 2004 were used with the ordinary least square multiple regression method. They found that debt payment to London club creditors, Paris club creditors, promissory notes holders and other creditors have significant impact on the GDP and GFCF. Debt payment to Paris club creditors and debt payment to promissory notes holders are positively related to GDP and GFCF, while debt payment to London club creditors and other creditors shows a negative significant relation to GDP and GFCF. They therefore recommended among others that government should ensure that any loan deal with either London club or other creditors should be deal that will open Nigeria

to greater trade and investment and can stimulate the private sector, since debt payment to these two creditors impact negatively on our economic growth.

There is another set of empirical studies that examined in more detail the impact of different levels of public debt on economic growth and found out that negative relationship exists only after a certain debt-GDP ratio. Smyth and Hsing (1995) indicate that the optimal debt ratio is 38.4% for debt held by the public sector and 48.9% for total debt. Pattillo *et al.*, (2002) using a large panel data set of 93 developing countries for the period 1969-1998, support that the negative impact of external debt on per-capita GDP growth exists only when the net present value of debt levels are above 35%-40% of GDP. In the same line, Clements *et al.*, (2003) based on a panel of 55 low-income countries data over the period 1970-1999, revealed that the turning point in the net present value of external debt is at 20%-25% of GDP. Kumar and Woo (2010) examined the impact of high public debt on long-run economic growth, based on a panel of advanced and emerging economies' data for a period of almost four decades. The empirical results suggest that on average, a 10% point increase in the initial debt – to GDP ratio is associated with a slowdown in annual real per capita GDP growth of around 0.2% points per year.

Anyanwu and Erhijakpor (2004) studied the impact of debt on economic growth of Nigeria over the period 1970–2003. The study reported that debt has a significant negative impact on economic growth. El-Mahdy and Torayeh (2009) investigated the debt and growth relationship for Egypt's economy using data spanning 1981–2006 and the study revealed a robust negative relationship between debt and growth. Ogunmuyiwa (2011) evaluated the effect of debt on Nigeria's economic growth from 1970–2007. The results revealed a weak and insignificant relationship between debt and growth. Shah and Shahida (2012) investigated the effect of the public debt on economic growth of Bangladesh for the period 1980–2012 and found no impact of debt on economic growth.

It is crystal clear that most of the above empirical reviews were either on public expenditure or public debt and economic growth and no attempts were made by any of the previous researchers to investigate the effect of debt servicing on economic development. This study is set out to close that gap by examining the effect of debt servicing on per capita income (as proxy) for economic development.

Methodology

The study made use of the ex-post facto research design, which involves ascertaining the impact of past factors on the present happening or event using already existing data that cannot be manipulated. This study covers a period of 21 years from 2000 to 2020 and defined sample technique used is 21. Data for this study were obtained from secondary sources extracted from the website of the Central Bank of Nigeria. The variables used in the study are: the Dependent and the Independent variables.

Dependent variable is Per capita Income and independent variables include: External debt, Domestic debt and Total debt servicing in Nigeria for the period under review.

Model specification

$$PCI = \alpha + \beta_1 EDBT_{it} + \beta_2 DDBT_{it} + U_{it} \dots \dots \dots \text{Model 1}$$

α = Constant

PCI = Per Capita Income

EDBT = External Debt servicing

DDBT = Domestic Debt servicing

it= Cross sectional data(i) Time (t)

U = Error term used in the model.

$\beta_1 + \beta_2 + \beta_3$ = Beta coefficient of the independent variable.

Decision Rule

Accept the null hypothesis if the calculated value is greater than the significant level of 0.05.

4.1 Data presentation and analysis

Data Analysis

Table 1: Descriptive Statistics of the Series

	<u>PCI</u>	<u>EDBT</u>	<u>DDBT</u>
Mean	1890.873	812.28	42.76571
Maximum	3222.693	2804.12	147.86
Minimum	567.9307	124.5	6.55
Std. Dev.	793.4361	790.3133	41.62916
Probability	0.1341	0.2904	0.2916
Observations	21	21	21

Source: Author's Computation, 2023

Table 1 shows the data used for analysis in their raw forms. The number of observations used for the study is 21 years. This represents data from 2000 to 2020 used for the analysis.

For PCI, the data reveal a mean value of \$1890.873 with a deviation of \$793.4361. PCI has a maximum and minimum values of \$3222.693 and \$567.9307. EDBT data reveal a mean value of 812.28 billion Naira with a deviation of 790.3133 billion Naira. EDBT has a maximum and minimum values of 2.80412 trillion Naira and 124.5 billion Naira. Lastly, the DDBT data reveal a mean value of 42.76571 billion Naira with a deviation of 41.62916 billion Naira. DDBT has maximum and minimum values of 147.86 billion Naira and 6.55 billion Naira. The maximum,

minimum, means, and deviations of the variables reflects the characteristics of the data for each variable and the ensuing level of fluctuation.

As shown in table 1, EDEBT, DDBT and PCI all have the combined Kurtosis and Skewness probability values greater than 0.05 and are accordingly shown to be normally distributed. This is ensured after the data are transformed from their N'Billion forms into their logged forms to ensure normality and stationarity of the data.

Stationarity test

Unit Root Test

Table 2. Unit root tests using Augmented Dickey Fuller Criterion

Variables	T. Stat	5% Critical value	Order of Integration
PCI	0.953	-1.950	$I(1)$
EDBT	2.407	-1.950	$I(1)$
DDBT	2.295	-1.950	$I(1)$
Cointegration	19.1692	29.68	No Cointegration

Source: Author's Computation, 2023

The unit root result in Table 2 indicates that all of the variables (PCI, EDBT, and DDBT) are stationary at level as their ADF Trace Statistics values became greater than the critical values at 5%. Since they all became stationary after suppressing the constants, there is need to conduct co-integration test to ascertain the collective stationarity of the variables and to see if there is need for both VAR and VECM test.

From the table above, the results revealed that there is no co-integrating equation with the combination of PCI EDBT and DDBT. This means that, the combination of the variable doesn't have a similar trend in the long run but in the short run a similar trend exist between the trends of the variable. As a result, the study will carry out both the VAR and VECM model to compare the short run trend against the long trend of the variables.

Table 3. Lag Order Selection Criteria

Lag	Logl
VAR	1
VECM	1

Source: Author's Computation, 2023

Table 3 indicates that the appropriate lag length for both the short run (VAR) and the long run (VECM) is one as indicated by the Schwarz information criteria producing the minimum values among the competing lag length criteria. As a result, this study adopts a one-period lag approach as suggested by the Stata software.

Table 4. VARmodel Test

VAR	Coef	Z	Prob.	R-sq	Chi2	Prob.
PCI		13.88	0.0000	0.9395	310.7864	0.0000
EDBT	-16.78242	-0.25	0.803			
DDBT	16.74307	0.25	0.804			
Const	21.86135	0.25	0.800			

Source: Author's Computation, 2023

The VAR results presented in tables 4 show that, each of the debt service variable (EDBT and DDBT) in the model is insignificant in explaining changes in PCI in the short run within the period of the study. This implies that the debt service cost incurred by Nigeria is meant to cause infrastructural changes than the income of citizens in the short run. This is further confirmed by the direct relationship that exists between the constant term and the PCI indicating that EDBT and DDBT rather influence long term infrastructural changes than short term changes in PCI. Regardless, the chi2value of 310.7864 with a probability value of 0.000 confirms the collective significance and fitness of the model in explaining variations in PCI if infrastructure is considered as a factor for causing a change in PCI. A confirmation is the R-sq indicating that EDBT and DDBT are responsible for 93.95 per cent variation in real PCI while the remaining 9.05 per cent variation is accounted for by infrastructural development(a significant long-term factor) not included in the model.

Table 5. The vector error correction model

VECM	Coef	Z	Prob.	R-sq	Chi2	Prob.
PCI		-3.98	0.0000	0.5661	10.74107	0.0047
EDBT	3586.089	2.93	0.003			
DDBT	-3585.705	-2.93	0.003			
Const	-4589.576			Lagrange		0.72284

Source: Author's Computation, 2023

In comparison with the VAR model, the VECM results presented in tables 5 show that; there is significant adjustment in the long run effect of EDBT and DDBT against PCI with a Probability value of 0.0047. This is also reflected in each of the debt service variable (EDBT and DDBT) result which indicates that both EDBT and DDBT are significant in explaining long run changes in PCI. Although while EDBT explains a positive significant long-run effect on PCI, DDBT explains a negative

significant long-run effect on PCI. This implies that the domestic debt incurred by Nigeria is not channeled to infrastructural development which would have caused positive changes to the income of citizens in the long run. Also, the χ^2 value of 10.74107 with a probability value of 0.0047 confirms the collective significance and fitness of the imposed VECM in explaining variations in PCI with consideration to long runtime factors for debt investment into infrastructural development. A confirmation is the R-sq indicating that EDBT and DDBT are responsible for only 56.61 per cent variation in PCI in the long run while the remaining 43.39 per cent variation might be accounted for by improved infrastructures (a significant long-term factor) which might enable private production and improved PCI; although it is not included in the model.

The result shows that there is no serial correlation (autocorrelation) among the residuals of the model. This is revealed using the probability value of the Lagrange test which is $0.05 < 0.0047$.

Test of Hypothesis

H₀: Debt servicing (External debt and Domestic debt) has no significant effect on per capita income in Nigeria.

From table 6, the VECM z-stat values for EDBT revealed calculated z value of 2.93 and a p-value of $0.05 < 0.003$ while DDBT revealed calculated z value of -2.93 and a p-value of $0.05 < 0.003$. Thus, the study rejects the null hypothesis and concludes that, debt (external and domestic) servicing have a significant effect on per capital income in Nigeria.

Discussion of result

From the hypotheses tested, the result revealed that debt (external and domestic) servicing has an insignificant effect on per capital income in Nigeria in the short-run while in the long-run debt (external and domestic) servicing has a significant effect on per capital income in Nigeria. This proves the point that debt as a means to finance fiscal policies of the government are used for capital expenditure which are probable to affect long term economic plans like infrastructure-financing that spurs productive capacity of citizens and their income in the long run. This conforms to the Wiseman and Peacock (1961) hypothesis of public expenditure on capital items in the budget. They argued that public expenditure does not increase in tandem to economic development in a smooth and continuous manner, but in jerks or stepwise fashion in the long run which favors a post-ante analysis of direction of causality on the budgets of government. In the case of this study, the VECM model has proved that, the Nigerian expenditure on public debt servicing has a post-ante long run effect on per capital income rather than a short run effect. This is a similar argument held by Kalu et al. (2016) who examined the impact of Debt Service Payment on economic growth

in Nigeria. Using an ordinary least square regression method, they found that, debt servicing has a positive and significant effect on economic growth in Nigeria.

Conclusion and Recommendation

In conclusion, the study proved through a comparative test of short run and long run analysis that, debt servicing expenditures in the long run positively affects the per capital income of Nigerian. This is against the short run case where debt servicing has no significant effect on per capita income of Nigeria.

In consonance with this study's conclusion, the study recommends that, the Nigerian government should ensure that more debt finance are channeled towards infrastructure development in order to stipulate more short term impacts of the borrowings on the income of Nigerians against the backdrop of short term burden debt servicing payments pose on per capital income since it leaves little funding available for recurrent expenditures that are short term stimulants of economic growth and income of citizens.

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