Impact of Public Debt on Infrastructural Development in Nigeria For The Period (2008-2021)

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ABSTRACT

The study evaluated the effect of external public debt on infrastructural development in Nigeria for the period 2008-2021. To achieve this objective, debt servicing cost (DSC), Trade Debt (TD) and balance of payment (BOP) were use as proxies for external public debt while infrastructural development is proxy by federal government capital expenditure on infrastructures. The study adopted ex-post-facto research design and data were obtained from National Bureau of Statistical Bulletin and CBN publication for the period. Multiple regressions anchored on ordinary least square (OLS) technique was used to test the hypotheses formulated at 5% level of significance. The findings revealed that debt servicing cost has negative significant effect on Federal Government Capital expenditure (FGCE); but trade debt has no significant effect on FGCE, while balance of payment has negative significant effect on FGCE in Nigeria. The implication of the study is that Nigerian Public external debt usage is not favorable to the Nigerian economy. The study therefore recommended that external debt should be used for the purpose for which it was borrowed for and such debts should be used on the basic infrastructural development that will help to improve on the business environment and economic output making for ease of repayment.

Keywords: Infrastructure, External debt, Capital expenditure, Balance of Payment and Nigerian Economy.

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I. Introduction

Background of the Study

Infrastructural development of any nation is the creation of basic foundational services to enhance economic growth of a Nation. Infrastructure has been strongly endorsed as a catalyst in the development and improvement of any nation, especially in improving access to social, human, natural and financial assets to the less privileged in the nation (Davies, Nwankwo, Olofinnade and Michael, 2019). It can be referred to as physical and organizational structures and facilities considered crucial in ensuring the security of any nation, its public health, safety and its economic growth (Gke, 2013). However, it is an acknowledged fact that most developing countries such as Nigeria are faced with the scarcity of funds to finance major infrastructural projects in their countries. Consequently, they usually have to seek for borrowing funds from both external and internal sources which had always served as veritable financial platforms for many developing countries in running their economies, on the condition of judicious use of the loans for the intended projects (Aladejana, Okeowo, Oluwalana and Alabi, 2021).

Since accumulating debts for the developing countries is a situation they must access in order to achieve enhanced infrastructural facilities, most developing economies are now advocating for "favourable debts". A favourable debt is one where the capital acquired has the potentials of high leftover after deducting the cost of the loan. In this situation, the debts will be for financing economic growth, increasing the infrastructural capacity and expanding output of the borrowing country (Pattilo, Ricci, and Poirson, 2004). In sub-Saharan Africa countries, financing developmental plans are heavily tied on foreign loans, a typical example is the 1st to 3rd developmental plans of Nigeria (Jacob 2004). It is as a result of this and other luxury-seeking attitude of leaders in these countries that have made the countries to have a heap of external debt to a level that it is unimaginable, as they never propel the needed economic growth that could finance the repayment or to service the loans (Akos and Istvan, 2019). Economists believe that borrowing is healthy for the infrastructural development and may help to maintain economic growth and development in a country, but the reverse is the

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case in Nigeria. Unfortunately, the realities on ground including the required infrastructure and debt accumulated between 2006 till date did not show that any correlation has been achieved (Madow, Nimonka, Brigitte and Camaerero, 2021).

The justification for government borrowing has its foundation in the neoclassical growth models, which prescribes the need for capital scarce countries to borrow to increase their capital accumulation and steady-state level of output per capita. The occurrence of global economic crises has provided further impetus for developing countries to borrow as they are often confronted with the need for increased expenditure levels and declining capital inflows (Ogbonna, Ibenta, Ejiogu and Atsanan, 2019). Conventional view suggests that public debt has a positive effect on economic growth in the short-run by stimulating aggregate demand and output. However, theoretical literature continues to point to a negative debt-growth relation in the long run by crowding out private investment and threatening economic growth through higher long-term interest rates, higher inflation, and higher future distortionary taxation (Mhlaba, Phiri and Nsiah, 2019).

The government incessant borrowing from the domestic market was limiting the private businesses that need credits from assessing funding for business expansion and growth (Ogunjimi, 2019). When a country spends significant parts of its revenue on servicing huge debts, it has very little left to fund critical infrastructures which in turn affect growth negatively. Moreover, the National Bureau of Statistics (NBS) 2019 Poverty and Inequality in Nigeria reports, indicated that 40.1% of the total population, or almost 83 million people, live below the country's poverty line of N137,430 (\$381.75) per year, thus highlighting the low levels of wealth in a country that has Africa's biggest economy.

Despite the revenue shortfalls recorded, government recurrent expenditure (debt and non-debt) remained high and in line with budgetary expectations while the much-needed capital expenditure continued to suffer serious decline over the last two decades. The continued depletion in Nigeria's revenue (Naira) raises the questions about the solvency of the Nigerian economy. Based on the above background, this study seeks to explore the impact of external public debt on infrastructural development in Nigeria.

Statement of Problem

Nigeria is currently ranked among Sub-Saharan African countries that are heavily indebted with a stunted GDP growth rate, retarded export growth rate, a fast dwindling income per capita and an increasing poverty level (Ogbonna et al, 2019). Most of these African countries, Nigeria inclusive, have been trapped by hasty and distress borrowing which they are often unable to service. Worse still, they need to borrow more, because of the sustained drop in prices of crude oil in recent years in the global market. Nigeria's 2005 debt relief provided by the Paris Club of creditors motivated largely by the need to free-up resources for investment and faster economic growth led to a significant decline in the country's debt burden in 2006. Unfortunately, some few years after, the country is back in huge debt crisis. Successive governments have been accumulating debt in an alarming rate especially the current government while debt-servicing cost has again increased astronomically to become a sour point in Nigeria's budgetary process in the last decade. The economy is, therefore, over burdened with massive government debts and debt service costs that consume more than half of government scarce revenue (Ogunjimi, 2019). More worrisome still is the lack of evidence that the borrowed funds have been properly utilized for the purpose for which it was borrowed.

This ugly situation precipitated debt crisis that worsened progressively overtime, narrowing down the fiscal space for government to invest in critical infrastructure that supports private investments and sustains economic growth. The inability of the Nigerian government to adequately service her debt, pay up her trade debt and appropriately maintain an adequate balance of payment is pointing toward another debt crisis which may not be far ahead. It is evident that unsustainable public debt is discouraging investment and lowering growth in Nigeria, thereby reducing the country's global competitiveness, and increasing financial market susceptibility to international shocks (Ogbonna et al., 2019).

Objectives of the Study

The broad objective of the study was to evaluate the impact of external public debt on infrastructural development in Nigeria. Specifically, the study focused on impact of debt servicing cost; ascertained the impact of trade debt and implication of balance of payment on infrastructural development in Nigeria.

Significance of the Study

The findings and recommendations of this study will be of a great assistance to the nation's Debt management office in taking effective decision that will enable Nigerian government to obtain external loan that can enhance infrastructural development in Nigeria. Policy makers will also be guided by the outcome of this study on the best way to utilizing external public loan for the interest of the citizenry by using such loans for the purpose for which it was obtained.

II. Literature Review

External Public Debt: The act of borrowing creates debt. Debt, therefore, refers to the resources of money in use in an organization which is not contributed by its owners and does not in any other way belong to them (Udoka and Ogege, 2012). Public debt can either be domestic or external debt. Domestic debts are those debts incurred within the country while external debts are those debts incurred outside the shore of the country. Udoffia and Akpanah (2016) defined external debt as packages that consist of a combination of financial, technical and managerial requirements emanating from outside the country, aimed at supporting economic growth and development and are repayable at determined future date in foreign currency. External debt is a major source of public receipts. The accumulation of external debt does not signify slow economic growth. It is a country's inability to meet its debt obligation compounded by the lack of information on the nature, structure and magnitude of external debt. Nigeria's external debt as observed by Ndubuisi, (2017), increased so much due to excess borrowing from international agencies and countries at non-concessional interest rate as a result of the decline in oil earnings

Debt Servicing Cost: Debt service is the amount of money required in a given period to pay for the interest expense and principal of an existing loan. To put it more simply, it is the amount of money a country (debtor) agreed to pay for a number of periods during the lifetime of a loan. Debt service is a term that is normally employed in the financial industry to define the amount of both principal and interest that a given company has to pay to their creditors, either through a bank or bondholder. This concept also applies to individuals, since they are also exposed to loans such as auto loans, credit cards, home mortgages and many others (Ndubuisi, 2017).

Trade Debt: Trade Debt is defined as the money payable by a company to its supplier for goods or services received by it. In other words, it is an arrangement where payment for goods or services is not made upfront. This payment has to be made to the supplier at a later scheduled date, as decided by both countries. For example, suppose country (A) buys goods N10,000 from country. (B) It makes an upfront payment of N2000 at the time of purchase. By mutual agreement, it decides to pay the balance amount of N8000 after a certain period of time. Here, N8000 is the trade debt for country A.

Balance of Payment: A Balance of Payment Statement of a country indicates whether the country has a surplus or a deficit of funds. If a country's export is more than its import, its balance of payment is said to be in surplus. The balance of payment includes current account, capital account, and financial account. The total of the current account must balance with the total of capital and financial accounts in ideal situations. There are various categories of trade and transfers which happen across countries. It could be visible or invisible trading, unilateral transfers or other payments/receipts. Trading in goods between countries is referred to as visible items and import/export of services (banking, information technology etc) is referred to as invisible items.

Infrastructural Development: The term infrastructural development on the other hand is used to denote a state of improvement in the general status of the basic physical and organizational structures and facilities such as buildings, roads, and power supplies needed for the operation of a society or enterprise. Hence, these basic physical and organizational structures and facilities as already exemplified are referred to as infrastructure. Thus, infrastructural development include the provision, construction, improvement and rehabilitation of capital and productive projects such as roads, airports, hospitals, education and research institutes, power development, human resources development, improved security, among others, in consonance with international standards. It can be referred to as physical and organizational structures and facilities considered crucial in ensuring the security of any nation like its public health, safety and its economic growth (Oke, 2013). It is grouped into two namely: hard and soft infrastructures. Hard infrastructure is the physical infrastructure of roads, bridges, electricity, markets, health centres amongst others; while the soft infrastructure deals with human capital development and establishments that cultivate infrastructure such as universities (Fung, Garcia-Herrero, Lizaka and Siu, 2005). Therefore, infrastructure development of any nation is the creation of basic foundational services to enhance economic growth and quality of life. Some basic infrastructure development involves transportation such as rail and road networks, water, resource management, electricity, schools and hospitals among others (Davies et al, 2019).

Empirical Review

Aladejana, Okeowo, Oluwalana and Alabi (2021) investigated debt burden and infrastructural development in Nigeria. Annual time-series data were sourced from CBN statistical bulletin for the period of 1986-2019. Multiple regression test anchored on ordinary least square (OLS) was employed in test of hypotheses at 5% level of significance. The findings of the study revealed that both current and lagged coefficients show positive and significant relationship between domestic debt and infrastructural development, while current and lagged of external debt shows a negative relationship with infrastructural development and not statistically significant during the period of the study. The implication of the findings is that increase in domestic debt leads to increase in infrastructural development at the short run while external debt of the federal government has not resulted to improvement in infrastructural development in Nigeria for the period studied.

Saungwene and Odhiambho (2019), explored the causal relationship between government, debt servicing and economic growth in Zambia for the period 1979-2017 using dynamic multivariate approach. In their model, real gross domestic product (RGDP) was modeled as a function of stock of public debt, fiscal balance and savings as a share of GDP. Data were analyzed using descriptive statistics, while hypotheses were tested using multiple regression technique with the aid of E-views, 9.0 at 5% level of significance. The empirical results indicated unidirectional causal relationship from economic growth to public debt in Zambia.

Ogunjimi (2019) studied the impact of public debt on investment in Nigeria. The study aimed at examining the impact of public debt variables on investment within Nigeria. Data were gathered from Bureau of statistics publications and CNB bulletins. Data obtained were analyzed descriptively using descriptive statistics while the hypotheses formulated were tested using regression model techniques at 5% level of significance. Outcome of the analysis indicated a negative significant impact on investment in Nigeria.

Akhanolu, Babajide, Akinjara and Tolulope (2018) examined the effect of public debt on economic growth in Nigeria using data for the period 1982-2017. Data were obtained from CBN Statistical bulletin and Bureau of statistics annual publications. Descriptive statistics was employed to analyze the data while multiple regressions, anchored on OLS was used to test the hypothetical relationship test which showed that external debt had a significant negative impact on growth while internal debt revealed a positive impact.

Kharusi and Ada (2018) examined external debt and economic growth in an emerging economy. The objective of the study was to determine the effect of public external debt variables on economic growth in an emerging economy. Data were sourced through secondary means and were analyzed using descriptive statistics. Multiple regressions anchored on ordinary least square technique was employed to test the hypotheses. The result showed that external public debt variables have an inverse relationship with economic growth for the period studied.

In a similar study, Onakoya and Ogunade (2017) examined external debt and the Nigerian economic growth for the period 1981-2014. Data covering the period of the study were obtained from CBN Statistical Bulletin and National Bureau of statistics. Analysis of data was done using descriptive statistics while multiple regression tests were used to test for hypotheses at 5% level of significance. The outcome of the hypothetical test indicated that external debt is negatively related to economic growth for the period covered by the study.

In a related study, Ndubuisi (2017) explored the impact of external debt on economic growth in Nigeria. Data were gathered from secondary sources for the period 1985-2015. The variables included gross domestic product, external debt servicing, external debt stock, external reserve and exchange rate. Data were analyzed using descriptive statistics while ordinary least square regression was adopted to test the hypotheses of the study. Findings showed that debt service payment has negative and insignificant impact on Nigeria's economic index.

Elo-Obed, Odo and Anoke (2017) analyzed the relationship between public debt and economic growth in Nigeria. The variables used in the study included RGDP, foreign debt, domestic debt and domestic private savings. Data were obtained from CBN statistical bulletin and Bureau of statistical publications for the period 1980-2015. Descriptive statistics was employed to analyze the collected data. Multiple regressions anchored on ordinary least square (OLS) were adopted to test the formulated hypotheses at 0.05 level of significance. The findings showed a significant negative economic growth in Nigeria.

Theoretical Framework

The study is anchored on dependency theory propounded by Raul Prebisch (1950s). To explain the nature of the relationship between the countries of the world and the factors that facilitated the dependency of one group of countries on the other. Dependency theory states that the poverty of the countries in the periphery is not because they are not integrated or fully integrated into the world system as often argued by free market into the system. The theory assumes that resources flow from periphery of poor and underdeveloped states to wealthy state, enriching the later at the expense of the former. This theory is related to this study due to the underdeveloped nature of Nigeria including other developing countries where they depend on the western world for virtually everything ranging from technology, loan and even culture.

III. Methodology

Research Design: This study adopted *ex-post facto* research design. *Exp-post facto* research design is a method of testing out possible and antecedent of events that have occurred and therefore, cannot be manipulated by the researcher (Kerlinger, 1970).

Model Specification

The multiple regression model is state as: $y = f(b_1x_1, b_2x_2, \dots, x_n)$

Explicit representation of the baseline model is used in order to determine the nature of the relationship between public external debt and infrastructural development in Nigeria, depends behaviorally on the explanatory variables (elements of external debt). Hence, such behavioral relationship is state in the equation below:

 $FGCE = \beta_0 + \beta_1 DSC + \beta_2 TD + \beta_3 BOP + U_t$

It can also be expressed as

 $Log FGCE = \beta_0 + \beta_1 Log DSC + \beta_2 Log TD + \beta_3 Log BOP + U_t$

Where

FGCE =Federal Government Capital Expenditure (a proxy for infrastructural development)

DSC = Debt Servicing Cost

TD = Trade Debt

BOP =Balance of Payment

 $B_0 = Constant$

 $B_0 \beta_1 \beta_2$ =Slopes of Coefficient of the explanatory variables

 $U_t =$ Error term Log =Natural Log

In order to achieve the objective of measuring the variables, external public debt was made measurable using elements such as debt servicing cost, trade debt and balance of payment while infrastructural development is proxy by federal government capital expenditure. Data for measuring the variables were obtained from CBN Statistical Bulletin and National Bureau of Statistics publications.

Method of Data Analysis

This study adopted a quantitative approach to analyze the data obtained through secondary sources. Data were analyzed using descriptive statistics in order to determine the characteristics of the research variables. Linear multiple regressions anchored on ordinary least square (OLS) were employed to test the formulated hypotheses at 0.05 level of significance with the aid of E-views 9.0. The decision rule that guided the study was anchored on the conventional probability values > 5%, reject H_1 and accept H_0 ; but P-value $\le 5\%$, accept H_1 and reject H_0 . Therefore, the outcome of the OLS regression analysis was evaluated by the researcher based on the above stated decision rules.

Data Presentation

Table 1: Descriptive Statistics of the Variables

	FGCE	DSC	TD	BOP
Mean	14.894	11.307	10.999	19.967
Median	14.665	11.339	119.565	12.000
Maximum	19.925	12.948	380.720	76.800
Minimum	11.469	9.233	2.020	0.200
Std. Dev.	2.249	1.231	-94.441	18.706
Skewness	1.019	0.371	1.0537	1.718
Kurtosis	3.571	1.895	4.194	4.771
Jarque-Bera	3.356	2.510	8.312	21.158
Probability	0.042	0.285	0.0156	0.000
Sum	506.389	384.440	3637.990	678.880
Sum Sq. Dev.	166.452	50.003	294329.4	115448.39
Observations	34	34	34	34

Source: Author's E-views Output, 2021.

In table 1 above, the descriptive statistics for all the variables that operationalized the study in a common sample was presented. The maximum value for capital expenditure in our sample was \(\frac{\text{\tex

Test of Hypotheses

Table 3: Presentation and Analysis of Regression Result Total panel (balanced) observations: 34

DSC	-1.5699	1.11356	-3.4098	0.0348
TD	-0.0199	0.0153	-2.2010	0.2088
BOP	-0.0603	0.0216	-4.7870	0.0118
С	0.4515	0.3864	1.1685	0.2571

R-squared	0.739554	Mean dependent var	0.337222
Adjusted R-squared	0.610487	S.D. dependent var	0.116383
S.E of regression	0.222318	Akaike info criterion	-1.401370
Sum squared resid	0.988504	Schwarz criterion	-0.177937
Log likelihood	4.220867	Human-Quinn criter	-0.033684
F-statistic	23.081250	Durbin-Watson Stat	1.573982
Prob (F-statistic)	0.003640		

Source: Author's Computation Using E-views, 9.0, 2021

Decision Rule

The decision rule is anchored on the conventional probability values (P-value) associated with the regression outcome. The decision rule is stated thus: Reject the null hypothesis if the probability value associated with t-statistic of the coefficient is not significant at 5% or 0.05 and accepts the alternate hypothesis and vice versa.

Technically, the decision rule is expressed thus:

If P-value $\leq 5\%$ - > Reject H₀ and Accept H₁

But if P-value > 5% - > Accept H_0 and Reject H_1

Interpretation of Regression Result

The result in table (3) above showed that the P-values of DSC, TD and BOP are 0.0348, 0.2088 and 0.0118 respectively with the corresponding t-values of -3.4098, -2.3010 and- 4.7870. Based on the result presented above and guided the decision rule, Debt servicing Cost (DSC) had significant effect on (FGCE) in Nigeria. However, TD has no significant effect on FGCE in Nigeria, while BOP has significant effect on FGCE in Nigeria. The negative values of the t-statistics revealed that the effect of DSC and BOP on FGCE showed negativity in direction of their relationships.

 $R^2 = 0.711594$ implies that about 71% of the changes in FGCE is as a result changes in the DSC transactions, TD transactions and BOP transactions; while 29% is caused by factors not included as variables but which are capable of affecting FGCE in Nigeria. Durbin Watson is 1.573982, which means that there is no presence of autocorrelations as it falls between the normal ranges of 1.5 to 1.9. Also, the result of the F-statistic 23.081250 is high which indicated that the variables are jointly significant in explaining Federal Government Capital Expenditure (FGCE).

Discussion of Findings

The findings from the test of hypothesis formed the basis of discussion which was made in line with specific objectives of the study. Our findings were compared with the results from previous studies by authors on related topics.

Effect of Debt Servicing Cost on Federal Government Capital Expenditures in Nigeria

The result presented in table (3) above clearly indicated that P-value in respect to hypothesis one (1) is (0.0348), based on the decision rule earlier stated, the P-value fall within the acceptable significant level of 5%. Therefore, the researcher rejected the null hypothesis and accepted the alternate. Hence, the implication of this decision by the researcher is that debt servicing cost has a negative and significant effect on Federal Government Capital Expenditure. The result of this study however, does not conform to Ndubuisi (2017) who found that debt servicing cost has negative and insignificant impact of Nigeria's economic growth. Also, the results of this study disagree with Amaefule and Umeaka (2016) who found no significant relationship between capital expenditure and external debt variables.

Effect of Trade Debt on Federal Government Capital Expenditures

The outcome of the regression analysis in table 3 also showed that the P-value of trade debt is 0.2088 with a corresponding t-value of -2.2010; the implication of this is that null hypothesis is accepted while alternate is rejected. Therefore, Trade Debt has a negative insignificant effect on Federal Government Capital Expenditure in Nigeria. The negative t-value showed that the relationship is negative. The outcome of this test is also in line with the findings of Amaefule and Umeaka (2016) that no significant relationship was found between capital expenditure and external debt variables in Nigeria.

Effect of Balance of Payment on Federal Government Capital Expenditures (FGCE) in Nigeria

The result of hypothesis (3) as presented in table (3) showed the P-value of balance of payment is 0.0118 with a corresponding t-value of -4.787, based on the decision rule stated above; balance of payment has negative and significant impact on Federal Government Capital Expenditure in Nigeria. Its relationship is both significant, and negative. Moreover, the outcome of the test agreed with Akhanolu, Babajide, Akinjara and

Tolulope (2018) who observed that external debt variables has a significant and negative effect on Federal Government Capital Expenditures in Nigeria.

Implication of the Study: The outcome of the analysis revealed that debt servicing cost has negative significant effect on Federal Government Capital Expenditure in Nigeria; but trade debt has no significant effect while balance of payment has negative significant effect on Federal Government Capital Expenditures in Nigeria. The implication of the study is that an increase on debt servicing cost and balance of payment will result in corresponding decrease in the Federal Government Capital Expenditure in Nigeria and vice versa while a change in trade debt will not bring any change in government capital expenditure in Nigeria.

Summary of Findings

- 1. Debt servicing cost has a negative significant effect on Federal Government Capital Expenditure.
- 2. Trade debt has negative and insignificant effect on Federal Government Capital Expenditure.
- 3. Balance of payment has a negative significant effect on Federal Government Capital Expenditure

IV. Conclusion

The dwindling oil and non-oil revenue, and the need to meet its financial obligations necessitate the government to borrow. Hence, based on the findings, we observed that unit increase in debt servicing cost and trade debt will bring about a corresponding decrease in infrastructural development in Nigeria; while an increase in balance of payment will not bring any change in infrastructural development in Nigeria. Therefore, we concluded that external debt of Nigeria has not contributed in improving the development of the Nigeria's physical infrastructure and increase in level of debt servicing to the creditor country has reduced the level of infrastructural development in Nigeria.

Recommendations

- (i) External debt should be used for the purpose for which it was borrowed and such should be on basic infrastructural development that will help to improve on the business environment and economic output making for ease of repayment.
- (ii) External debt is meant to boost the development of the debtor country and enhance the living standard of the citizenry. Therefore, Nigerian government should ensure that debts incurred are channeled towards identified and specific infrastructural projects and not for solving short run problems.
- (iii) Adequate measures should be put in place by government to ensure that borrowed funds are expanded on capital project that will generate income and there should be appropriate measures put in place that will serve as checks and balance on government spending.

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APPENDIX Raw Data

2008	157.470	1.716010	28.27368	9.900
2009	164.420	2.128170	28.34700	10.400
2010	170.640	1.168400	30.99187	7.700
2011	188.310	1.809280	32.91681	7.500
2012	251.840	1.754750	35.94466	17.000
2013	260.520	8.807000	20.47797	28.300
2014	281.010	6.727840	3.544490	42.300
2015	301.160	0.910985	3.654210	51.300
2016	369.060	0.354415	4.534190	32.300
2017	387.100	0.351619	5.633710	32.300
2018	403.670	0.293003	6.527070	32.600
2019	425.440	0.297329	8.821900	43.800
2020	452.280	0.346723	9.711450	34.200
2021	464.281	0.331059	10.71843	28.300

Source: Debt Management Office, CBN Statistical Bulletin, 2022.

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