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Government Revenue, Public Debt and Infrastructural Development in Nigeria during 2014 - 2023

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ABSTRACT

The essence of infrastructural development and its implications on Nigerian economy are no longer contentious but its adequacy has become an issue of concern especially in the emerging economies like Nigeria. On this note, this study evaluated the effect of government revenue on infrastructural development. Furthermore, it examined the influence of public debts on infrastructural development in Nigeria. All these are to provide insight as to the relationship between government revenue; public debts and infrastructural development in Nigeria.

Longitudinal research design was employed. The population was the Nigerian economy which was infinite in nature. The source of data was secondary. Capital expenditures were measured as infrastructures while oil revenue and non-oil revenue were employed to proxy government revenue. Domestic and external debts were the proxies of public debts. The data were collected from statistical bulletins. The data were estimated descriptively and inferentially.

This study showed that the trend of infrastructural development in Nigeria was ups and downs. In addition, the study revealed that government revenue has no statistically significant effect on infrastructural development in Nigeria (χ^2 = 1.98; p > 0.05). Furthermore, it was found that public debts significantly affected infrastructural development in Nigeria (χ^2 = 14.91; p < 0.05).

This research work concluded that while the development of infrastructures in Nigeria was influenced by the public debts, the government revenue did not affect it within the stated periods. So, it is recommended that the government should block all the leakages to revenue generation.

Keywords: Budget, Economic development, Fiscal policy, Projects implementation, Standard of living.

1.0 INTRODUCTION

The level of infrastructural development in any country determines the growth rate of its economy and this is consistent across the globe. In view of this, Nigeria is not exempted. Infrastructural development in Nigeria suffers a lot of setbacks despite the government's efforts in accelerating and facilitating its provision. This poor condition of infrastructural development in Nigeria says a lot about Nigerian economy. The government, having understood the positive repercussions that the development of infrastructure will bring to the nation, strived to address the issue from varied frameworks, namely, regulatory, statutory and institutional frameworks (Nedozi et al., 2020). In the regulatory framework, the government established the policy on Public-Private Partnership (PPP). This policy governs the steps that must be followed by the Nigerian government to involve private investments in accomplishing infrastructural development. Aside from this, government set up policies such as Vision 2020, Sustainable Development Goal. All these policies recognize and work with the statutory framework which includes Privatization and Commercialization Acts of 1999, Public Procurement Act of 2007, Infrastructure Concession Regulatory Commission Act of 2005, Fiscal Responsibility Act of 2007. Conscientiously, government instituted some institutions to serve as institutional framework so as to corroborate the effectiveness and efficiency of the first and second frameworks. Therefore, institutions like National Planning Commission, Bureau of Public Enterprises, Infrastructure Concession Regulatory Commission (ICRC), and Bureau of Public Procurement were established. The goal of setting these frameworks by the government was to ensure that infrastructures abound in the country to enhance the economic growth. The question now is to what avail are these efforts? In reality, all the government actions on the infrastructures were to no yield. The private sector involvement in developing infrastructures in Nigeria brings a negligible difference to the

infrastructural development despite the provision of some projects through PPP policy. Some hydro power plants, Garki hospital Abuja, and domestic airport terminal came into existence via PPP, yet the expectation and need of the citizens on infrastructures had not been met. This deficit in the provision of infrastructures has been ascribed to militating factors such as mismanagement, corruption, inflation, lack of consolidation of past projects by the successive government and lack of access to bank loans while the major drivers of the infrastructures in any country are the amount of government revenues and effective utilization of public debts (Rewane, 2022).

Therefore, public revenue that is well utilized by the machinery of government optimises the various fiscal commitments of the government which will give birth to the provision of infrastructures. The larger proportions of government revenue since 2014 in most of the sub-Saharan nations were committed into the capital expenditures and Nigeria was not exempted (Samuel & Tyokoso, 2021). These capital expenditures were for capital projects which translated into infrastructures. A research survey conducted in Nigeria revealed that there was a mismatch between the amount of government revenue invested on capital expenditures and the value of benefit derived by the citizens from these capital projects (Uche & Adebiyi, 2022). Consequently, the standard of living and economic progress were not wearing any positively significant changes. Put differently, the growing societal and government spending had not really fostered the economic development and growth in the country. Aside from this mismatch, all other sources of government revenue were dwindling as a result of overdependence on oil revenue. Also, the fiscal policies; all budgetary controls and measures were not well monitored even with the introduction of treasury single account (TSA) into the collection of government revenue. Usually, the government activities and policies for development have financial attachments. Hence, revenue is collected by the government to finance its plans. Mostly, the core sources of revenue for financing government projects in Nigeria are oil and non-oil revenues.

However, this core source is not sufficient to cater for the execution of all developmental programmes and policies. Consequently, government fall back to borrowing. As a result of setbacks in the utilization of government revenue to enhance infrastructural development, the public debts of Nigerian government kept increasing. The public debts were mostly incurred with impression and belief of providing infrastructures for the people in the country. The records had shown that government went to borrow either internally or externally to increase the number of infrastructural facilities in the country. An analysis of a yearly estimated revenue and expenditure in Nigeria revealed the government directions on oil and non-oil revenues, borrowing funds and infrastructures (Jethro & Mann, 2022). Public debt is an important mechanism that is employed by the government to finance capital formation, retain capital projects and stimulate economic growth, particularly in economic atmosphere where an increase in taxation and reduction of government spending become impossible.

1.1 Research Objective

The principal objective of this research is to evaluate the influence of government revenue and public debt on infrastructural development in Nigeria between 2014 and 2023. Specifically, the study is to:

i. Assess the trend of infrastructural development in Nigeria from 2014 to 2023;
ii. Ascertain the effect of government revenue on infrastructural development over the stated periods; and
iii. Examine the effect of public debt on infrastructural development in Nigeria.

2.0 LITERATURE REVIEW

In this section, the review of concepts, constructs, theoretical framework and past studies was given attention so as to keep the potential researchers alert and at the same time, acknowledge the work of previous researchers.

2.1 Infrastructural Development in Nigeria

Infrastructures are the primary resources and services that must be in place for development (Canning & Pedroni, 2021). Infrastructural development has been widely documented in the literature as a key driver of economies (Babatunde et al., 2023). Development in any dimension cannot lead to good healthy living unless infrastructures such as telecommunications, transportation, energy, water, health, housing, and education are invested in (Garba & Disu, 2020). Successive African governments have failed to prioritise infrastructure development in developing countries,

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and the Nigerian government is not immune to this. The availability of good infrastructure such as roads, railways, highways, ports, communication networks, and electricity, combined with a stable political environment, would increase productivity and thus attract higher levels of foreign direct investment. However, for a country like Nigeria, which has many neighbouring developing countries, infrastructure development could provide a comparative advantage in attracting investment. According to Herranz-Lonca (2023), this is why the country must invest more in infrastructure and try to lower the escalating price of cement, with incentives for investors to enter the building material market; it is this infrastructure development that will serve as the foundation for FDI attraction into Africa's most populous nation. Nigeria has the potential to host a large number of global investments, but due to a lack of infrastructure development, these opportunities have not been fully realised. Infrastructures such as electricity, roads, railways, and water facilities are in disrepair, with poor repairs and maintenance (Ijaiya & Akanbi, 2022).

2.2 Government Revenue in Nigeria

Oil and non-oil revenues account for the majority of government revenue. Oil revenue includes proceeds from crude oil sales, petroleum profit tax, rents, and royalties, whereas non-oil revenue includes corporate income tax, customs and excise duties, value-added tax, and personal income tax (Adegbite, 2021). Since the 1970s, oil revenue has been the primary source of government revenue, accounting for more than 70% of federally collected revenue (CBN, 2000). Total federal tax revenue accounted for only about 6% of GDP on average between 1960 and 1979. However, rapidly increasing tax revenues are required not only to match highly elastic public current expenditures, but also to generate savings to fund government capital expenditure programmes. As a result, the growth potential of various tax revenue sources must be evaluated on a regular basis. As a result, the growth potential of various tax revenue sources must be evaluated on a regular basis. Taxation in Nigeria is enforced by the three tiers of government, namely the federal, state, and local governments, with each having a clearly defined sphere under the Taxes and Levies (approved list for collection) law of 1998. Nigeria's tax system is made up of three components: tax policy, tax laws, and tax administration (Akhor et al., 2022). All of these are expected to collaborate in order to achieve the nation's economic goals. According to the Presidential Committee on National Tax Policy (2008), the primary goal of the Nigerian tax system is to contribute to the well-being of all Nigerians, both directly through improved policy formulation and indirectly through the appropriate use of tax revenue generated for the benefit of citizens.

2.3 Public Debts in Nigeria

Public debt is the amount a country owes to lenders outside its borders (Abula & Ben, 2023). Public debt, also known as national debt, refers to the total amount of debt owed by a country's government both internally and externally. External debts are the government's obligations to international institutions such as the IMF and AfDB (Vincent, 2021). Internal debts are debt obligations owed by the government to country residents. The accumulation of debts or borrowings (internal and external) results from a country's budget deficits, which are caused by the government spending more than it receives through taxation (Mbah, 2020). Previously, the CBN managed Nigeria's domestic debt by issuing government instruments such as Nigerian Treasury Bills (NTBs), Nigerian Treasury Certificates, Federal Government Development Stocks, and Treasury Bonds. The debt management strategy implemented at the time resulted in inefficiencies, posing fundamental challenges. In light of these numerous challenges, the government established an autonomous debt management office to achieve efficient debt management practices. The Debt Management Office (DMO) was established on October 4, 2000, to centrally coordinate the management of Nigeria's debt for all levels of government. While the Federal Government (FG) guarantees state governments' external borrowing, domestic borrowing requires analysis and confirmation by the FG based on clear criteria and guidelines that states can repay based on their monthly allocations from the Federation Account Allocation Committee (FAAC) and internally generated revenue (IGR).

2.4 Theoretical Framework

In this section, the theory that serves as the foundations for this research was reviewed to justify the bases for the need of the study. Economic theory of traditional infrastructure is the theoretical cornerstone for this study. This theory was linked to Edward Steinmueller in 1956. The economic theory of infrastructure focused on the economic arguments for the management and sustainability of certain public resources in an open access. The theory analysed the management

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and sustainability of these important resources from the demand-side and value-generation perspectives for the entire citizens which was different from the conventional analysis. These two perspectives were explained from the three key assumptions.

Firstly, infrastructures as fundamental resources create value in the productive sector of the economy. The use of infrastructures can serve as an input in the productive processes and consequently, having positive effect on the final products. This should be the motive for the provision and management of infrastructures.
Secondly, infrastructures as fundamental resources are demanded by the public because of their positive externalities to the society. The citizens demand for them because they are non-market goods. The private ownership of these infrastructures can lead to social costs and exploitation. So, looking at this rationale, the management and sustainability of these beneficial resources should be shouldered by the government.

Thirdly, this economic theory of infrastructures argued that the management of infrastructures should be openly accessible. The access to infrastructures should be open rather than allowing private institutions to manage them or spearhead the provision as this will amount to business-oriented management at the expense of open management.
This economic theory emphasized that the infrastructural development should always be motivated by the aforementioned assumptions. However, this economic theory of traditional infrastructure was critiqued by Daniel Spulber and Christopher who argued that the motive of providing the fundamental resources should be drawn from supply-side alone, that is, excludability, natural monopoly and anti-competitive behaviour. This theory of traditional infrastructure is most relevant to the study under consideration as lack of infrastructure is considered to be one of the key problems to economic development in the low-income economy.

2.5 Empirical Review

Review of past studies in terms of their findings was undertaken in this section and it was done objective by objective.

2.5.1 Effect of Government Revenue on Infrastructural Development

Government revenue is counted as one of the properties that can influence the trend of infrastructural development in an emerging economy. On this note, the exploration of the past studies concerning research title; effect of government revenue on infrastructural development revealed that research works by Adegbite, (2021), Adegbite and Fasina, (2022), Gwa and Kase, (2020), Ogbonna and Appah, (2021), Okwori and Sule, (2020), Omoruyi, (2022), Oti and Odey, (2021), Rewane, (2022), found that government revenue had a significant effect on infrastructural development. This means, the magnitude of government revenue comes to bring changes in the level of infrastructures. On the other hand, Akhor, Atu and Ekundayo, (2022), Desmond, (2020), Groves and Kahn, (2022), Lewis, (2023), Mahdavi, (2020), Martin and Lewis, (2022), Oriakhi and Ahuru, (2021), Sahota, (2020) carried out research on the same topic, concluded that government revenue did not affect infrastructural development. In view of these arguments, this study opines that to establish the effect of government revenue on infrastructural development; methodology employed in the research, proxies of variables, nature of collected data, database system of every country, analytical techniques, and methods of data collection played significant roles in the outcome of those studies.

2.5.2 Effect of Public Debts on Infrastructural Development

Also, public debts form one of the drivers of infrastructural development in the country. Studies about public debts and infrastructural development by Babalola, and Onikosi-Alliyu, (2020), Babu, Pantaleo and Ndanshau (2020), Festus, Emmanuel, Theophilus, and Ademola, (2022), Jethro and Mann, (2022), Traum and Yang, (2020), Udoka, and Ogege, (2021), Yusus and Mohd, (2023), showed that public debts significantly affected infrastructural development. This explains the fact that borrowings are controlled. The borrowers must be careful before expending because most of the public debts are borrowed for specific projects. However, Komlan, and Essosinam, (2022), Martin and Aleš, (2020), Ndoricimpa, (2020), Nguyen, (2020), Reinhart and Rogoff, (2021), Robert and Bernanke, (2023), Uche and Adebiyi, (2022) researched on the same subject and found that public debts had no statistically significant effect on infrastructural development. This implies that infrastructural development is not sensitive to any changes in public debts. This might be possible if we have die-hard people in government who indulge in serious diversion of public

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debts. Besides, the officials of financial institutions might even be treating borrowing rules with levity for their inordinate desires so as to make personal gains out of it. As a result of the two perspectives, this study infers that to examine the effect of public debts on infrastructural development; methodology employed in the research, proxies of variables, nature of collected data, database system of every country, analytical techniques, and methods of data collection played significant roles in the outcome of those studies.

3.0 METHODOLOGY

The approach of carrying out this research study with respect to data collection and model specification is described under this section.

In this study, longitudinal research design was employed in order to be able to establish both the short-run and long-run relationship among the government revenue, public debt and the state of infrastructural development in the country for the stated periods. Since the research work involve the macroeconomic variables, secondary data were collected through the Federal Inland Revenue (FIR) Statistical Bulletin, Central Bank of Nigeria (CBN) Statistical Bulletin and Debt Management Office (DMO) Statistical Bulletin. The type and nature of the data collected was time series and quantitative respectively. The independent variables are government revenue and public debt while the dependent variable is infrastructural development. The analysis of the data was premised on the descriptive and inferential statistics. The descriptive analysis involved mean, median, minimum, maximum, skewness, kurtosis and Jarque-Bera. The inferential statistics focused on ordinary least square regression. This study employed time series variables. Consequently, unit roots test was conducted to establish the stationarity of the observations.

3.1 Model Specification

Two models were specified in accordance with the specific objective two and three as earlier stated in this research work.

The following acronyms were employed for the variables in question:

Infradev means infrastructural development. Gorev means government revenue. Pudebt denotes public debts.

General Form:

$Y_t = f(X)_t$

$Y_t = \delta_0 + \delta_1 (X)_t$

$Y_t = \delta_0 + \delta_1 (X)_t + \varepsilon_t$ ……..Eq.(3.1)

3.1.1 Effect of Government Revenue on Infrastructural Development in Nigeria

$Infradev_t = f(Gorev)_t$

$LogCE_t = \beta_0 + \beta_1 logCE_{t-1} + \beta_2 logOR_{t-1} + \beta_3 logNOR_{t-2} + \varepsilon_t$ ……Eq(3.1.1)

Natural log of capital expenditure (CE_t) was used as a proxy for infrastructural development and it was observed for 10 years ranging from 2014 to 2023.

Natural log of oil revenue (OR_t) and natural log of non-oil revenue (NOR_t) were employed as measures of government revenue and they were also observed over the stated periods.

β_0 means the average value of log of capital expenditure when log of oil revenue and log of non-oil revenue equal to zero.

β_1 is the slope of log of oil revenue

β_2 is the coefficient of log of non-oil revenue

ε_t is the stochastic term

A priori expectation is $\beta_1, \beta_2 > 0$

3.1.2 Impact of Public Debts on Infrastructural Development in Nigeria

$Infradev_t = f(Pudebt)_t$

$LogCE_t = \mu_0 + \mu_1 logCE_{t-1} + \mu_2 LogDD_{t-2} + \mu_3 LogED_{t-2} + \varepsilon_t$ ……Eq(3.1.2)

Natural log of capital expenditure (CE_t) was employed as a measure of infrastructural development and it was observed for 10 years ranging from 2014 to 2023.

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Natural log of domestic debts (DD_t) and natural log of external debts (ED_t) were embraced as measures of public debts and they were also observed over the stated periods.

μ_0 means the average value of log of capital expenditure when log of domestic debts and log of external debts equal to zero.

μ_1 is the parameter of log of domestic debts

μ_2 is the parameter of log of external debts

ε_t is the error term

A priori expectation is $\mu_1, \mu_2 > 0$

Both the dependent and independent variables in the above models were logged to control largeness of their values because they were estimated in billions of naira (N'billion).

4.0 RESULTS AND DISCUSSION

4.1 Analysis of Trend of Infrastructural Development in Nigeria from 2014 to 2023.

Figure 4.1 below reflected the pace at which infrastructural development moved in Nigeria from 2014 to 2023. The y-axis represented infrastructures being measured in percentage against the x-axis represented by years. This Figure 4.1 gave the graphical impression of how Nigerian infrastructures had trended over the stated periods. The infrastructures in Nigeria grew up from 2014 to 2015. The growth rate was about 25%. Though this trend was below the average and consequently, it might not be felt by the economy. The increase in the trend might be accounted for by the fact that it was the period of general election in Nigeria. So, government provided some infrastructures to entice the electorates.

Thereafter, the trend of infrastructures declined till 2018. It dropped by 49%. The decline in infrastructures together with economic recession in 2016 made the livelihood to be tight for the citizens. During these periods, there was a change in government. The new government did not give priority to infrastructures as most of the projects embarked upon by former regime were abandoned. The trend of the infrastructural development went up again till 2021. This was as a result of government plans to revive the economy.

In these periods, positive change of about 120% was noticed in infrastructures and this allowed the economy in Nigeria to expand. There was a drop by 35% in 2022 and a rise by 43% in 2023. On one hand, the downward trend might be occasioned by the loss of focus as the government was planning to hand-over. On the other hand, a rise in the trend of infrastructures came as a result of the realization of losing the grab of authority by the ruling government. Therefore, additional amenities were provided and the on-going ones were completed. By and large, the trend of infrastructural development in Nigeria did not meet the expectation when compared with the rest of world.

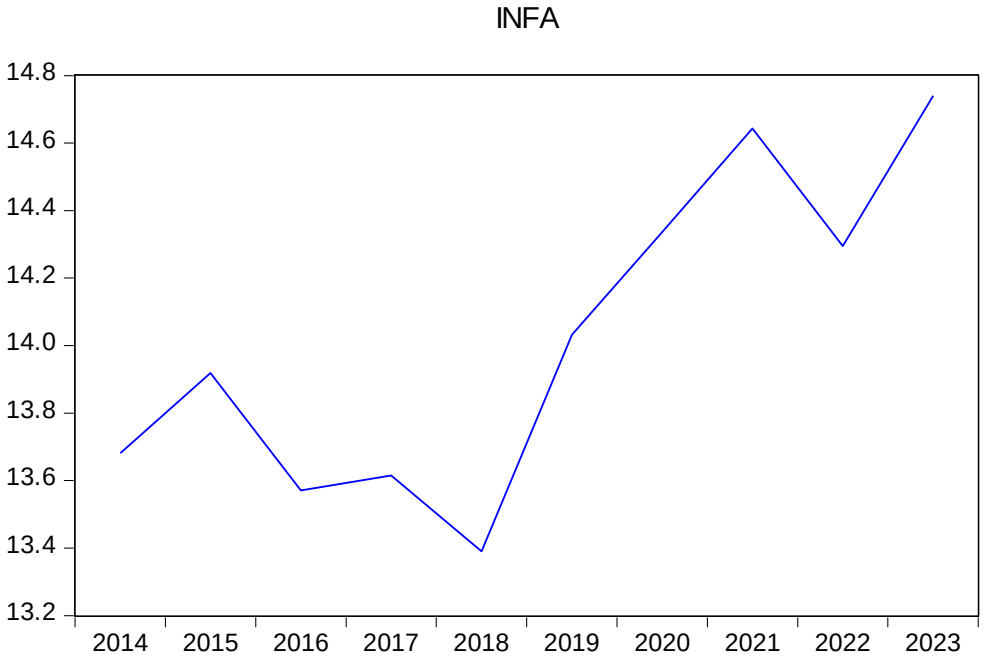

FIGURE 4.1 Trend of Infrastructural Development

Source: Researcher's computation, 2024

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4.2 Descriptive Statistics

Table 4.2 revealed the descriptive qualities of the variables observed in this research work. Infrastructural development had a mean of 14.022. This was the average value of total amount of money incurred on infrastructures for 10 years ranging from 2014 to 2023. The value was in billions of naira. The maximum and minimum values of infrastructures from Table 4.2 were 14.741 and 13.390 respectively. The maximum amount of money spent on infrastructural development was N14,741,000,000 while the minimum amount of expenditures on infrastructures was N13, 390,000,000. The infrastructural development was positively skewed with a value of 0.2386 while it is leptokurtic as its value of 1.7326 is less than 3 which is the threshold. Having observed infrastructural development in Nigeria for 10 years, the probability of Jarque-Bera Statistics revealed that infrastructural development was normally distributed (JB = 0.764; p> 0.05).

In Table 4.2, oil revenue (OR) as one of the proxies of government revenue had a mean of 15.427. This suggested that government realized an average of N15,427,000,000 in a year. The maximum amount of oil revenue was N15,898,000,000 and the minimum amount was N14,807,000,000. The oil revenue had a negative skewness of -0.3605 and was leptokurtic. The distribution of oil revenue was normal (JB = 0.332; p > 0.05).

Also from Table 4.2, non-oil revenue (NOR), the second proxy of government revenue, had a mean of 15.110. This implied that the average amount of money generated through non-oil revenue was N15,110,000,000. Nigeria was able to generate a maximum and minimum of N15,671,000,000 and N14,782,000,000 respectively from non-oil revenue over the stated periods. Non-oil revenue had a positive skewness. It was leptokurtic with a value of 2.59. Non-oil revenue was normally distributed (JB = 1.101; p > 0.05).

Table 4.2 reflected the mean value of 16.211 in favour of domestic debts (DD). This indicated that Nigerian government borrowed an average of N16,211,000,000 within the country. The maximum borrowings domestically was N16,773,000,000. The minimum debts by the government within the country was N15,693,000,000. Domestic debt as a proxy of public debts was negatively skewed. It had a leptokurtic value of 1.770. This variable was normally distributed (JB = 0.631; p > 0).

Table 4.2 showed that external debt had a mean of 15.228. Averagely, N15,228,000,000 was the external debt of Nigerian government per annum. The maximum value of external debt was N16,579,000,000 while the least amount of external debt was N13,832,000,000. The external debt was negatively skewed just like the domestic debt. Similarly, it was leptokurtic with a value of 1.54 which was less than threshold of 3. The distribution of external debt was also normal (JB = 0.631; p > 0.05)

TABLE 4.2 Descriptions of the Observed Variables

	InDD	InED	InFA	InNOR	InOR
Mean	16.211	15.228	14.022	15.110	15.427
Median	16.284	15.317	13.975	15.011	15.448
Maximum	16.773	16.579	14.741	15.671	15.898
Minimum	15.693	13.832	13.390	14.782	14.807
Std. Dev.	0.3621	0.9839	0.4679	0.2767	0.3246
Skewness	-0.0282	-0.0531	0.2386	0.7867	-0.3605
Kurtosis	1.7708	1.5384	1.7326	2.5917	2.4726
Jargue-Bera	0.6309	0.8949	0.7642	1.1010	0.3324
Probability	0.7295	0.6393	0.6824	0.5767	0.8469
Sum	162.11	152.28	140.22	151.10	154.27
Sum Sq. Dev.	1.1799	8.7131	1.9704	0.6890	0.9483
Observations	10	10	10	10	10

Source: Researcher's computation, 2024

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4.3 Correlation Analysis

Table 4.3 explained the relationship among the observed variables in this study. There was a positively strong relationship between infrastructural development and domestic debts as well as external debts (r = 0.77 and 0.81 respectively). Similarly, infrastructural development has a positively strong relationship with non-oil revenue but a positively weak relationship with oil revenue (r = 0.90 and 0.11 respectively). In addition, there was a negatively weak relationship between non-oil revenue and oil revenue (r= -0.13). Both domestic and external debts have a positively significant relationship with non-oil revenue (r =0.89 and 0.89 respectively) but a negatively moderate relationship with oil revenue (r = -0.48 and -0.41 respectively). Generally, there was no existence of multicollinearity among the independent variables. However, domestic debt was highly correlated with external debt (r = 0.99).

TABLE4.3 Analysis of Relationship among the Observed Variables

	InDD	InED	InFRA	InNOR	InOR
InDD	1.000000				
InED	0.991659	1.000000			
InFRA	0.768439	0.808889	1.000000		
InNOR	0.887453	0.888665	0.895662	1.000000	
InOR	-0.480952	-0.407303	0.108270	-0.132595	1.000000

Source: Researcher's computation, 2024

4.4 Unit Root Tests

Table 4.4 contained the results that were used to test for the stationarity of variables considered in this research work. The value of t-statistic of Augmented Dickey-Fuller (ADF) and critical value at 5% were compared to establish the stationarity in the unit root test. The null hypothesis states that the variable in question is not stationary.

Log of infrastructural development, using the ADF, is: t = -3.134; p < 0.05. The critical value @ 5% is -1.996. In view of this, t-stat of -3.134 is less than critical value of -1.996. So, null hypothesis was rejected and concluded that log of infrastructural development was stationary at first difference (I_1).

Log of domestic debts, using the ADF, is: t = -2.879; p < 0.05. The critical value @ 5% is -2.006. In view of this, t-stat of -2.879 is less than critical value of -2.006. So, null hypothesis was rejected and concluded that log of domestic debts were stationary at second difference (I_2).

Log of external debts, using the ADF, is: t = -3.119; p < 0.05. The critical value @ 5% is -2.021 In view of this; t-stat of -3.119 is less than critical value of -2.021. So, null hypothesis was rejected and concluded that log of external debts were stationary at second difference (I_2).

Log of non-oil revenue, using the ADF, is: t = -2.765; p < 0.05. The critical value @ 5% is -2.006. In view of this, t-stat of -2.765 is less than critical value of -2.006. So, null hypothesis was rejected and concluded that log of non-oil revenue was stationary at second difference (I_2).

Log of oil revenue, using the ADF, is: t = -2.329; p < 0.05. The critical value @ 5% is -2.006. In view of this, t-stat of -2.329 is less than critical value of -2.006. So, null hypothesis was rejected and concluded that log of oil revenue was stationary at first difference (I_1).

TABLE 4.4: Results of Unit Root Test

Variables	Augmented Dickey-Fuller: t- statistic	Prob *	Critical value@ 5%	Order of Integration at Difference
InDD	-2.879	0.011	-2.006	**I_2**
InED	-3.119	0.008	-2.021	**I_2**
InFA	-3.134	0.006	-1.996	**I_1**
InNOR	-2.765	0.013	-2.006	**I_2**
InOR	-2.329	0.029	-2.006	**I_1**

Source: Researcher's computation, 2024

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4.5 Regression Analysis

4.5.1 Effect of Government Revenue on Infrastructural Development in Nigeria

Table 4.5.1.1 showed the individual effect of non-oil revenue or oil revenue on infrastructural development in Nigeria while Table 4.5.1.2 revealed the joint effect of the two proxies (non-oil and oil revenues) together on infrastructural development in Nigeria. Since these two variables measured government revenue, then it was the joint hypotheses under Wald Test that was used to interpret the effect of government revenue on infrastructural development in Nigeria.

The intercept in Table 4.5.1.1 is 4.591. This indicated the average value of infrastructural development when the values of non-oil revenue and oil revenue equalled to zero. Non-oil revenue had two lags and positively related to infrastructural development in Nigeria. The slope of non-oil revenue is 0.442. A percentage increase in non-oil revenue will lead to 44.2% increase in infrastructural development. Individually, non-oil revenue has no statistically significant effect on infrastructural development in Nigeria ($t = 0.40$; $p > 0.05$). Oil revenue had one lag and negatively related to infrastructural development in Nigeria. the coefficient of oil revenue is -0.608. As oil revenue increased by 1%, infrastructural development decreased by 60.8%. Similarly, oil revenue has not significantly affected infrastructural development in Nigeria ($t = -1.03$; $p > 0.05$).

In Table 4.5.1.1, the coefficient of determination (R^2) is 0.647. This suggested that 64.7% variation in infrastructural development was caused by the government revenue while the remaining 35.3% variation could be traced to unobserved variables. F-statistic is 2.447 with probability value of 0.204. This means non-oil revenue and oil revenue do not have explanatory power for infrastructural development in Nigeria. Durbin-Watson is 2.81. The magnitude of this Durbin-Watson was an indication of non-existence of autocorrelation.

TABLE 4.5.1.1: Regression result of individual effect

Variables	Coefficients	t-stat	Prob.
C	4.591	0.264	0.805
InFA(-1)	0.873	1.649	0.174
InNOR(-2)	0.442	0.397	0.711
InOR(-1)	-0.608	-1.031	0.361
R-squared	0.647		
Adjusted R-squared	0.383		
F-statistic	2.447	Durbin-Watson stat	2.807
Prob(F-statistic)	0.204		

Source: Researcher's computation, 2024

TABLE 4.5.1.2: Regression result of joint effect

Wald Test			
Test Statistic	Value	df	Probability
F-statistic	0.990	(2, 4)	0.447
Chi-square	1.980	2	0.372

Source: Researcher's computation 2024

H_0: $p > 0.05$: Government revenue has no significant effect on infrastructural development in Nigeria

Decision Rule: The null hypothesis is accepted using the probability value of Chi-square, $p > 0.05$.

Hence, government revenue has no statistically significant effect on infrastructural development in Nigeria ($\chi^2 = 1.98$; $p > 0.05$).

4.5.2. Effect of Public Debts on Infrastructural Development in Nigeria

The results in Table 4.5.2.1 showed the individual effect of domestic debts or external debts on infrastructural development in Nigeria whereas Table 4.5.2.2 depicted the combined effect of both domestic and external debts on infrastructural development in Nigeria. As a result of this, the result of Table 4.5.2.2 were employed to interpret the effect of public debts on infrastructural development as domestic and external debts represented public debts in the model.

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The value of intercept is -29.88. When the values of domestic and external debts equalled zero, the average value of infrastructural development would be -29.88. Domestic debts positively related with infrastructural development by coefficient of 3.23. This means that the infrastructural development will increase by 32.3% due to 1% increase in domestic debts. In spite of this positive nexus, domestic debts insignificantly impacted on infrastructural development in Nigeria ($t = 1.49$; $p > 0.05$). On the other hand, external debts had an inverse relationship with the infrastructural development in Nigeria. The parameter of external debts is –0.614. 1% increase in external debts will cause the infrastructural development to decrease by 61.4%. In the same vein, external debts had no significant effect on infrastructural development in Nigeria ($t = -0.73$; $p > 0$).

R-squared is 0.89. This denotes that 89% variation in infrastructural development can be explained by public debts and the remaining 11% can be ascribed to unobserved variables. F-statistic is 10.62 with probability of 0.02. This is an indication that domestic and external debts have explanatory power for infrastructural development. Durbin-Watson is 2.86. This suggests that there is non-existence of autocorrelation as the magnitude of Durbin-Watson falls within the threshold of $2 \geq d \leq 4$.

TABLE 4.5.2.1: Regression result of individual effect

Variables	Coefficients	t-stat	Prob.
C	-29.880	-1.203	0.295
InFA(-1)	0.075	0.209	0.845
InDD(-2)	3.235	1.490	0.211
InED(-2)	-0.614	-0.729	0.506
R-squared	0.888		
Adjusted R-squared	0.805		
F-statistic	10.618	Durbin-Watson stat	2.856
Prob(F-statistic)	0.022		

Source: Researcher's computation 2024

TABLE 4.5.2.2: Regression result of joint effect

Wald Test			
Test Statistic	Value	df	Probability
F-statistic	7.453	(2, 4)	0.045
Chi-square	14.907	2	0.001

Source: Researcher's computation 2024

H_0: p > 0.05: Public debts has no significant effect on infrastructural development in Nigeria

Decision Rule: The null hypothesis is rejected using the probability value of Chi-square, $p < 0.05$.

Hence, public debts have a statistically significant effect on infrastructural development in Nigeria ($\chi^2 = 14.91$; $p < 0.05$).

4.6 Discussion of Findings

The analyses of the collected data resulted into the following findings based on the specific objectives raised in this study. Consequently, it was found that the trend of infrastructural development in Nigeria was not progressive in nature within the observed periods. This implied that the development of infrastructures was rising and dropping. This erratic pattern of the infrastructural development might be occasioned by some militating factors, namely, lack of good governance, lack of continuity of the same party, corruption, community problems etc.

In addition, it was also found that government revenue did not have a significant effect on infrastructural development in Nigeria from 2014 to 2023. This indicated that the development of infrastructures in Nigeria was indifferent to the amount of money realized from both oil and non-oil sources. This means that the higher or lower of government revenue does not influence the development of infrastructures in Nigeria. This finding looks esoteric but the fact of the matter is that the government allowed more leakages on government revenue. This finding is consistent with the outcomes of the empirical studies conducted by Akhor, Atu and Ekundayo, (2022); Desmond, (2020) but inconsistent with the findings of Adegbite and Fasina (2022); Gwa and Kase, (2020). This finding conforms to the assumptions of economic theory of traditional infrastructure.

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Furthermore, this study revealed that public debts had a statistically significant effect on infrastructural development in Nigeria for the stated periods. This suggested that whatever changes in infrastructural development reacted to the changes in public debts. This mutual relationship can be linked to the fact that public debts are obtained or attached to some capital expenditures. So, government must expend the debts on them specifically to be able to get more debts in another time. Besides, public debts are usually conditioned. Hence, the fulfilment of these conditions like repayment period brings changes in development of infrastructures. This finding aligns with the finding of Jethro and Mann, (2022) but it is at variance with the finding of Uche and Adebiyi, (2022).

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Infrastructures are the cornerstones of the economic development due to their influence on all facets of the economy, namely, production, construction, banking, insurance, agro-allied sector, maritime, mining etc. Despite the huge amount of money realized from both oil and non-oil revenue in Nigeria, no significant effect was recorded for government revenue on infrastructural development unlike the public debts that has a statistically significant impact on infrastructural development in Nigeria.

5.2 Policy Recommendations

The following recommendations are made in line with the findings;

That the government should look inwards to normalize the trend of infrastructural development in Nigeria;

That the government should block all leakages to revenue generation to increase its share for infrastructural development; and

That the government should increase the share of public debt that goes into infrastructural development.

5.3 Contributions to Knowledge

This research contributed to knowledge in the following ways:

The state of knowledge in literature was expanded with the presence of this study. The study contributed to knowledge by filling the gap of shortage of empirical studies in Nigeria on the area of interest. The inclusion of public debts as another independent variable makes the research to be unique compared to most of the past studies that employed only government revenue as a regressor of infrastructural development.

5.4 Suggestions for Further Studies

All the efforts put forth in this work are not devoid of limitations because of the human factors. Therefore, the study highlights the following suggestions for future researchers to explore.

The future researchers may include a moderating or mediating variable into the research title as this will give a new look to the research problem.

The future studies may look at infrastructural development from other drivers that were observed in the study such as government policies, environmental factors and human factors.

The future studies may extend the scope of the periods to 20 or 30 years to be able to see the long-run effect.

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