



EFFECT OF TAX REVENUE ON INFRASTRUCTURAL DEVELOPMENT IN NIGERIA

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ABSTRACT

This study assesses the effect of tax revenue on infrastructural development of Nigeria. Petroleum profit tax, company income tax, value added and custom and excise duties tax were used to proxy tax revenue, while capital expenditure was used to measure economic growth for a period of twenty seven years spanning from 1995 to 2021. Based on the objectives of the study, four hypotheses were formulated. Ex-Post facto research design was adopted. The time series data were obtained from Federal Ministry of Finance, Federal Inland Revenue Services, Central Bank of Nigeria, National Bureau of Statistics and the World Bank Publications. As a preliminary step in testing, the study employed the Augmented Dickey Fully Unit root test to confirm the order of integration of the time series variables. The study employed descriptive statistics and inferential statistics using Pearson correlation and Ordinary Least Square (OLS) regression analysis. The specific findings showed that: Petroleum profit tax has a significant and positive effect on capital expenditure of Nigeria ($B= 0.481341$; $p\text{-value} = 0.0060 < 0.05$); Company income tax has a significant and positive effect on capital expenditure ($B2=0.602013$; $p\text{-value} = 0.0000 < 0.05$); Value Added Tax has a significant and positive effect on capital expenditure ($B3= 1.155875$; $p\text{-value} = 0.0000 < 0.05$); Customs and excise duty has a significant and positive effect on capital expenditure ($B4= 1.530929$; $p\text{-value} = 0.0000 < 0.05$) of Nigeria at 5% level of significance respectively. It was recommended that Government should put in place adequate measure to ensure that revenue generated from tax is effectively utilized to develop and grow the economy through proper infrastructural development.



1. INTRODUCTION

Government revenue is money received by a government. It is an important tool of the fiscal policy of the government, and is the opposite factor of government spending. Revenue earned by government are received from sources such as taxes levied on the income and wealth accumulation of individuals and corporations, and on goods and services produced, exports and imports, non-taxable sources such as government owned corporation's income, central bank revenue and capital receipt in the form of external loans and debts from international financial institutions. Majorly, oil revenue has been and still is the mainstay of the Nigerian foreign exchange earnings. Babatunde (2015) noted that oil accounts for about 90 per cent of total foreign exchange revenue to the economy, though oil revenue as a share of total government revenue declined from about 75 per cent in 2012 to about 47 per cent in 2016 (CBN, 2017). Oil revenue contributed about 70% (\$50.3 billion) of government revenue in 2011. Thus, making the country's economy heavily reliant on the petroleum sector. This dominant role coupled with inadequate management of oil revenue during the periods of windfall, has pushed other productive sector like agriculture- the traditional mainstay of the economy from the early fifties and sixties to the background; thus, exposing the country to volatility in the crude oil market.

The Nigerian economy is currently in dire straits as the naira has fallen by over 50% and revenue from oil is at its lowest in the last two decades. This condition is attributable to the dwindling oil price and the overdependence on oil income as the major source of government revenue. The crash in oil prices from a high of US \$112 per barrel in August 2014 to levels of US \$40.08 per barrel in October 2020, has drastically reduced the federal government revenue, of which oil income used to be about 75%. Although oil price raised to \$70.33 in august 2021 (OPEC 2020), this still result in few revenues available to be allocated to the different levels of government for effective governance. The huge decline in government revenue has created significant pressure on Nigeria's currency due to; the overdependence on oil revenue and; limited investment in infrastructure when there was a boom in oil price. Infrastructural development has not been at its best during the last few decades regardless of the excess income derived during the era of oil boom which could have been channeled to infrastructural development and thus, diversification of the economy. Low level or inadequate infrastructural will scare away both private and foreign potential investors. This in turn will lead to low government revenue from taxes such as Petroleum Profit Tax (PPT), Company Income Tax (CIT), value Added Tax (VAT), Personal Income Tax (PIT), Excise duty, Stamp duty etc. Hence, government will be forced to depend on the already dwindling oil revenue, thus



impeding the growth and development of the economy and inability of government to execute its function. According to Edun, Akinde, Olaleye and Idowu (2013), despite Nigeria's economic growth over the years has not translated to economic development due to lack of infrastructure, high poverty rate, unemployment etc. A nation without infrastructure such as good roads, portable water, steady power supply, adequate security, Information Communication Technologies (ICTs) and so on, is like a body without anatomy. Poor public capital, proxied by an unreliable and inadequate power supply, significantly reduces productive private investment. Firms can substitute for inadequate provision of public capital by investing in it themselves. However, this comes at a cost. Today, inadequate infrastructure is holding back Nigeria's economic growth per capital by 2% each year and reducing firms' productivity by as much as 40%. The largest deficit in infrastructure in Nigeria can be found in the power sector, where only one in four Nigerian can have access to electricity, with a large percentage of Nigerians estimated to be experiencing regular blackouts due to power shortages. Even though firms struggle to cope by installing their own backup generators, this cost three to four times as much as the cost of grid electricity. The lack of affordable and reliable power is cited by investor as the number one constraint to doing business in most African countries, Nigeria inclusive. Another short coming in infrastructure can be found in roads in Nigeria. There are about 200000km of roads in Nigeria and 36000km belong to the federal government, of the later, only about 30% are in good condition. The share of the states and local government are in terribly worse conditions. The above contending inadequacies in infrastructural development scare potential investors away. This led to low income and the attendant income tax accruing to government. Nigeria's infrastructure deficit has been one of the biggest factors holding back its growth and development. The value of Nigeria's total infrastructure stock represents only 35% of GDP, significantly below that of emerging economy average of 70%, according to the country's Debt Management Office, with the World Economic Forum's 2019 Global Competitiveness Index having ranked Nigeria 116 out of 141 countries, largely due to the poor state of its infrastructure (Manny, 2021).

1.1 Objectives of the Study

The main objective of this study is to ascertain the effect of tax revenue on infrastructural development of Nigeria.

The specific objectives are to:

- 1) Determine the effect of Petroleum Profit Tax (PPT) on Capital Expenditure of Nigeria.
- 2) Ascertain the effect of Company Income Tax (CIT) on Capital Expenditure of Nigeria.
- 3) Evaluate the effect of Value Added Tax (VAT) on Capital Expenditure of Nigeria.



- 4) Ascertain the effect of Custom and Excise Duty (CED) on Capital Expenditure of Nigeria.

1.2 Hypotheses

In line with the above research questions, the following null hypotheses were tested:

- i. **H₀₁**- Petroleum Profit Tax (PPT) has no significant effect on Capital Expenditure of Nigeria.
- ii. **H₀₂**- Company Income Tax (CIT) has no significant effect on Capital Expenditure of Nigeria.
- iii. **H₀₃**- Value Added Tax (VAT) has no significant effect on Capital Expenditure of Nigeria.
- iv. **H₀₄**- Customs and Excise Duty has no significant effect on Capital Expenditure of Nigeria.

2. LITERATURE REVIEW

2.1 Conceptual review

2.1. 1 Government Revenue

The term revenue has been defined by various authors in different ways. Adam (2006) defined revenue as the fund required by the government to finance its activities. These funds are generated from different sources such as taxes, borrowing, fines, fees etc. It is also defined as the total amount of income that accrues to an organization within a specified period of time (Hamid, 2008). Bhaha (2001) contends that revenue include “routine and “earned” income. For these reasons, according to him, revenue do not include borrowing and recovery of loans from other parties, but it include tax receipts, donations, grants, fees and fines and so on. Similarly, Peace (1986) defined government revenue as all the money received other than from issue of all debts and liquidation of investments. Government revenue includes tax collections, charges and miscellaneous revenues, utility and insurance trust revenue for all funds and agencies of a government. This is money received by a government. It is an important tool of the fiscal policy of the government and is the opposite factor of government spending.

Revenue earned by the government are received from sources such as taxes levied on the incomes and wealth accumulation of individual and corporations and on the goods and services produced, exports and imports, nontaxable sources such as government owned corporations incomes, central bank revenue and capital receipts in the form of external loans and debts from international financial institutions. It is used to benefit the country. Government use revenue to better develop the country, to fix roads, provide steady power supply and adequate water supply etc. The money that the government collects pays for the services that are provided for the people. The sources of finance used by the federal government are mainly taxes paid by the public.



2.1.2 Tax Revenue

A tax (from the Latin *taxio*) is a mandatory financial charge or some other type of levy imposed upon a taxpayer (an individual or a legal entity) by a state or the functional equivalent of a state in order to fund various public expenditures. While taxation is the process whereby charges are imposed on individual or property by the legislative branch of the federal government and by many state governments to raise funds for public purpose. Tax is a compulsory levy imposed on a subject or on his properties and this is done by the government to provide security, social amenities, and create suitable conditions for the wellbeing of the society (Oluyombo & Olayinka, 2018). According to Ezu and Okoh (2016), tax is a burden which every citizen must bear to sustain the government because the government has certain functions to perform for the benefits of those it governs Tax revenue is the income that is gained by government through taxation.

Taxation is the primary source of income for a state. Revenue may be extracted from sources such as individuals, public enterprises, trade, and royalties on natural resources and / or foreign aid. An inefficient collection of taxes is greater in countries characterized by poverty, a large agriculture sector and large amounts of foreign aid. Just as there are different type of tax (such as Petroleum Profit Tax (PPT), company Income Tax (CIT), Value Added Tax (VAT), etc.), the form in which tax revenue is collected also differs; furthermore, the agency that collects the tax may not be part of central government, but may be a third party licensed to collect tax which they themselves will use. For example, in the UK, the Driver and Vehicle Licensing Agency (DVLA) collects vehicle excise duty, which is then passed onto HM Treasury.

In Nigerian context, each tier of government is saddled with the responsibility of collecting different taxes. The federal government collects taxes through the Federal Board of Inland Revenue (FBIR); the agency administers revenue laws that deal with taxes paid by the resident of the federal capital territory and taxes that are paid by corporate bodies (limited liability companies). They are responsible for accounting federal government for all taxes collected. The state government collects taxes through the state Board of internal revenue; the agency primarily administers the personal income tax act, and however, some states of the federation has instituted additional revenue statutes, which they administer. They are responsible for accounting to the state government for all revenue collected. The local government collects taxes through the local government revenue committee;



they are responsible for the assessment and collection of all taxes, fines and rates under its jurisdiction and account for all revenue collected to the chairman of the local government.

2.1.3 Petroleum Profit Tax (PPT)

Petroleum Profit Tax (PPT) is the taxation imposed on the profits from the winning of petroleum in the course of petroleum operation in an accounting period. Petroleum operations as defined by the act essentially involve the exploration, development, production and sale of crude oil. The principal legislation guiding the computation of this tax is the petroleum profit tax act 2004 (as amended). The petroleum profit tax act 1959 (PPTA) provides for the imposition of tax on the chargeable profits of companies that are engaged in petroleum operations in Nigeria. Petroleum operations is defined under the PPTA as “the winning or obtaining of oil in Nigeria by or on behalf of a company for its account by any drilling, mining, extracting or other like operations or process, not including refining at a refinery, in the course of a business carried on by the company engaged in such operations and all operations incidental thereto and any sale of or any disposal of chargeable oil by or on behalf of the company”. Gelb (1981) arrived that oil and gas production had been receiving favorable tax treatment for many years, although one special provision dealing with percentage depletion was repealed for most oil and gas produces in 1975.

The objectives of petroleum taxation according to Nwete (2004) are numerous among which are: taking in the petroleum industry is a way of achieving government’s objective of exercising right and control over the public asset, government imposes very high tax as a way of regulating the number of participants in the industry and discouraging its rapid depletion in other to conserve some for future generation. Nigerian economy is dependent on oil as it cannot finance social and economic growth in the absence of a large oil revenue base. Oil account for about 90-95% of the export revenue, over 90% of foreign exchange earnings and about 80% of government revenue. It is the most important tax in Nigeria in terms of its share of total revenue, contributing over 70% of government revenue and 95% of foreign exchange earnings (Oduola, 2006).

2.1.4 Company Income Tax (CIT)

The taxation of the profit of the companies is under the company income tax act (CITA) 1990. The term company for the purpose of CITA 1990 is defined under S.84 to mean any company or corporation (other than corporation sole or partnership) established by or under any law in forces in Nigeria or elsewhere. Electronic Wikipedia defined company tax as a direct tax, imposed by a jurisdiction on the income or capital of corporations or analogous entities. Company income tax is a



significant source of revenue to the government of Nigeria. It is a direct tax levied on the profits of companies in Nigeria. Government had always use company taxation not only to raise money to run the affairs of government but also is important tool for economic development. Ezu and Okoh (2016) posits that CIT has positive and significant effect on GDP in Nigeria. There is therefore, need to have in place a strong and vibrant tax administration not only at the federal level but also at the state so as to ensure that the objectives of tax system are achieved. The administration of the taxation of the profit of incorporated companies is vested on the Federal Board of Inland Revenue (FBIR) (Section 1(1) CITA). From 1996, the rate of company's income tax (CIT) in Nigeria has been 30%.

2.1.5 Value Added Tax (VAT)

Value Added Tax (VAT) is a tax on consumer spending. It is payable on goods and services consumed by any person whether government agencies, business organizations or individuals. It can also be defined as a tax on spending/consumption levied at every stage of a transaction but eventually borne by the final consumer of such goods and services. In Nigeria, it is levied at a flat rate of 5%. VAT is collected on behalf of the government by businesses or organizations which have registered with the Federal Inland Revenue Service (FIRS) for VAT purpose. Adereti, Sanni and Adesina (2011) study also show that VAT revenue affect economic growth of Nigeria during the period 1994 to 2008. With the present fall in the price of crude oil, Nigeria has been plunged into an economic downturn that has left the government desperately looking to other sources for revenue generation. Oil accounts for over 75% of government revenue and 90% of export revenue and gas fallen to levels below \$35 per barrel, compared to the glory days of \$100 plus oil prices; this is a 70% decline in prices and has been accompanied by a 27% fall in Foreign Direct Investment (FDI). These declines have had profound implications for the nation's revenue foreign reserve, public expenditure and economic growth. Specifically, the 2016 budget had planned a #2.22 trillion deficit with a benchmark oil price of \$38/barrel. With the current realities of oil falling below \$30/barrel, there is a much larger deficit to accommodate. In addition to the decline, the U.S lifting of Iran's economic sanction is a further threat to Nigeria. Iran which has the fourth largest oil reserve in the world (160 billion barrels) is now poised to export oil to the international oil market, and has recently announced it can produce oil at \$1/barrel. This means Iran can afford to sell its oil below the official international rate if it pleases, which would hamper Nigeria's efforts and revenue expectations. Other key challenges include the declining stock market, the increasing inflation rate (currently at 9.6%), the exchange rate volatility, the dwindling oil reserves, a problem which has prompted the Central Bank of Nigeria (CBN) to take several measures to defend the value of Naira.



As a result, it is becoming imperative for the government to diversify the economy and increase the revenue generation from other sources. Tax increases have been one of the front-line considerations, with an increase in VAT among the options.

2.1.6 Customs and Excise Duties

Over the years, custom and excise duties have been a major source of revenue for the Nigerian government. However, the problems of corruption, fraud and malpractices together with ineffectiveness in operations have hindered the desire to contribute maximally to the economic development of the nation. Adegbe and Falike (2011) in their study on the development and growth of the Nigerian economy stated that there is a strong relationship between customs and excise duties and the economic development of Nigeria. Customs duties in Nigeria are levied only on imports. Rates vary for different items, typically from 5% to 35%, and are assessed with reference to the prevailing Harmonised Commodity and Coding system (HS code). On the other hand excise duty is applicable on beer and stout, wines, spirits, cigarettes, and homogenized tobacco manufactured in or imported into Nigeria at 20%.

2.1.7 Infrastructural Development

The term infrastructure could be defined in various aspects, but the researcher will define it as the provision of essential services and amenities to the industry and household in the society (Martini and Lee 1996). Hence, infrastructural development projects are a key input in the development of the economy and a panacea economic activity and growth. However, what is regarded as “essential”, “key”, and “panacea” changes from one country to another. For instance, the massive production of steel, coal and iron ore was once regarded as indispensable infrastructure. Infrastructures are of two types which are: hard and soft infrastructure (Adesoji & Chike, 2013). According to them, hard infrastructure refers to the large physical networks necessary for the function of a modern industrial nation, whereas soft infrastructure refers to all the institutions which are required to maintain the economic health, culture and social standards of a country, such as the financial system, the education system, the healthcare system, the system of government and law enforcement as well as emergency services.

.Investopedia (2021) noted that infrastructure is the basic physical systems of a business or nation; transportation, communication, sewage, water and electric systems are all examples of infrastructures. These systems tend to be high-cost investment; however, they are vital to a country’s economic development and prosperity. Projects related to infrastructure improvements may be



funded publicly or privately or through public-private partnership. According to Wikipedia (2017), infrastructure refers to the fundamental facilities and systems serving a country, city or area, including the services and facilities necessary for its economy to function. It typically characterizes technical structures such as roads, bridges, tunnels, water supply, sewer, electrical grids, telecommunications, and do forth and can be defined as the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions.

In Nigeria, under investment in infrastructural development was a bane to her vision of becoming a top 20 economy by the year 2020. Despite her economic growth over the years, this has not translated to economic development due to lack of infrastructure, high poverty rate, unemployment etc. According to Afubero and Okoye (2014), the primary economic goals of developing countries are to increase the rate of economic growth and hence per capita income, which leads to a higher standard of living. Krol (2001) gave an excellent summary of existing literature, which suggests that reduction in congestion and adequate maintenance contribute to greater benefits from public infrastructure. Similarly, Renikka and Svensson (2000) have shown that poor public capital significantly reduces the complementary private investment.

2.1.8 Capital Expenditure

Capital expenditure and environmental activities both have significant influence on the overall economic and social welfare of society (Harris & Raviv, 1996; Brammer & Pavelin, 2006). Capital expenditure take the form of government acquisitions intended to create future benefits, such as infrastructure investment or research spending, or government investment which is the largest part of the government (Wikipedia). Salawu (2005) observed that public sector expenditure is the expenses incurred by the government for the maintenance of itself, the economy and society at large. Anyanwu (1993) observed that public expenditure is simply government spending from revenue derived from taxes and other sources. Policy makers according to Iheanacho (2016) places more emphasis on the role of public sector expenditure as an instrument which the government can apply to restore some economic problems such as reduction inequality inflation, fall in exchange rate, unemployment, dwindling oil price and the desire to restore the economy on the part of full employment, price stability, balance of payment equilibrium and above all, increase in economic growth. Notable studies in the likes of Abu, Abdullahi and Omoke all stressed that expenditure on defense, internal security, education, health, agriculture, construction, transport and communication are rising overtime.



Ebiringa and Charles (2012) emphasized that capital expenditure during the last decade was relatively low compared to recurrent expenditure constituting below 50% of total public sector expenditure.

It must also be noted that the public sector capital expenditure, theoretically, is the aspect of public sector expenditure expected to drive economic growth out of the various categories in public sector expenditure. In the light of the foregoing, it could be deduced that the current state of Nigeria economy could be partly linked to the nature of public sector expenditure. Intuitively, for a developing nation, capital expenditure particularly in capital projects or infrastructural development ought to constitute significant proportion of her total public sector expenditure to lay the foundation for economic growth and sustainable development, but this has not been the case the case in Nigeria.

2.2 Theoretical Review

2.2.1 The Benefit Received Theory

Adam Smith in *The Wealth of Nations* (1776) wrote: "Such things as defending the country and maintaining the institutions of good government are of general benefit to the public. Thus, it is reasonable that the population as a whole should contribute to the tax costs. It is also reasonable to demand certain other things of a tax system. In modern public-finance literature, there have been two main issues: who can pay and who can benefit (Benefit principle). The benefit received theory formed the framework for this study. The theory derived from the presumed relationship between the state and taxpayers, and in which the state is obligated to provide certain goods and services so the members of the society in compensation for taxes paid for such supplies (Bhartia, 2009). This theory addresses the need for government to effectively utilize tax revenue in providing economic and social facilities to the populace, and by extension contribute to economic development (Ihendinihu, 2014). This theory therefore presupposes that improvements in tax revenue should be accompanied by increased spending on infrastructural amenities. Increased spending in turn may facilitate shift from low productivity and low savings, to high steady growth state.

2.3 Empirical Review

Obi, Emenike and Chukwurah (2021) examined the effect of internally generated revenue on the infrastructural development of local governments in Anambra state: 2014-2018. Specifically, the study was carried out to determine the impact of internally generated revenue on health care infrastructure, primary educational facilities, water resource infrastructure and rural electrification. Four research questions and four null hypotheses guided the study. The study adopted a descriptive



survey research design and was conducted in Awka South, Anaocha, Onitsha North, Anambra East, Ihiala and Orumba North Local Government Areas of Anambra State. The population for the study is 1252650 people of the local government areas, 400 sample sizes was obtained using Taro Yamane's formula, proportionate allocation method was used to allocate the samples to the local governments. The instrument for data collection was a structured questionnaire which was face-validated by research experts. The data collected for this study was analyzed using mean and simple percentage; however chi-square was used to analyze the hypotheses. The findings of the study showed that the internally generated revenue have no impact on infrastructural development in the local governments, due to the smallness of the revenues generated.

Tanko and Shishi (2020) examined the effect of revenue generation on infrastructural development in Taraba State. The study covered the period of 2010-2019 due to limited availability of data. The descriptive research design was used. The study employed secondary data. IGT=Internally Generated Revenue for the year, STA=Statutory Allocation Receipt for the year, GTR=Grant Receipt for the year were used as proxy for revenue, while capital expenditure was used as proxy for infrastructural development. Data were collected from the National Bureau of Statistics (NBS), Office of Accountant General of Taraba State, Taraba State Planning Commission, Treasury Division in Taraba State Ministry of Finance, Central Bank of Nigeria (CBN) Bulletin, newspapers and Taraba State Board of Internal Revenue (TSBIR) and the data were analyzed using regression with Newey-West standard error since the study is time series. The study revealed that IGR has a positive impact on infrastructural development. Similarly, the grant received by the Taraba State Government improved infrastructural development.

Danbeki, Baninla and Bassey (2020) examined the trend of internally generated revenue and effect on infrastructural development in Taraba State from secondary data were collected from Taraba State Ministry of Finance 2011-2019. The expost facto research design was used. Data were collected on internally generated revenue (IGR) proxied as PAYE, Direct assessment and fines and licenses and on the predictor variables which were Infrastructural development proxied by annual expenditure on Water infrastructure, Road infrastructure, Electricity infrastructure, Educational infrastructure. The data have been tabulated and statistically analyzed using time series graphical visualization with the aid of Minitab 17. The findings of the study revealed that the actual generated IGR falls below the budgeted IGR for the years covered. The actual IGR stands insufficient in funding infrastructural development in the state.



Ajike, Ariguzo, Akinyoso, Nwankwere and Oyedeji (2020) investigated the impact of internally generated revenue on infrastructural development in Lagos State, Nigeria (1998-2018). Stamp duty, capital gains tax, education tax and petroleum profit tax were used as proxy for internally generated revenue while transport infrastructure was applied as proxy for infrastructural development. Ex-post facto research design was employed for the study. Secondary data was used. The study covered an evaluation of annual time series data for a twenty-one-year period, commencing from years 1998 to 2018. Findings revealed that internally generated revenue components had significant effect on transport infrastructure ($R^2 = 0.891$, $Adj. R^2 = 0.804$, $F(1,187) = 10.254$, $p < 0.05$) in Lagos State, Nigeria. The study concluded that internally generated revenue enhances the transport infrastructural development in Nigeria.

Okezie and Tunji (2020) examined Nigeria's tax structure and economic development from the standpoint of infrastructural deficiencies. This study's population consisted of 4,200 tax practitioners, senior management staff of the Federal Inland Revenue Service in Lagos State. Simultaneously, Taro Yamane's formula was used to determine the sample size of 365. Cronbach Alpha reliability coefficients take values between 0.864 and 0.952, thus confirming the reliability of data used. The study employed a survey research design using a structured questionnaire administered to senior tax practitioners and senior staff of the Federal Inland Revenue Service. A total of 85% of the questionnaire administered were retrieved while descriptive and inferential statistics were used for the data analysis. The study found that the tax structure had a significant positive effect on infrastructure in Nigeria.

Omoniyi and Hassan (2020) assessed internally generated revenue and infrastructural development in Ogun State. This study relied on secondary data generated from journals, articles, books, internet and data obtained from National Bureau of Statistics, Joint Tax Board and State Boards of Internal Revenue from 2011 to 2016. The categories of the Data source adopted by the National Bureau of Statistics which were also adopted by this paper are: Ministries, Departments and Agencies (MDAs); Direct Assessment; Pay As You Earn (PAYE); Road Taxes and Other Taxes. A straight forward analytical review was employed. The study revealed that IGR has contributed significantly to the provision of infrastructure in the State.

Olugbade and Adegbe (2020) examined the contributions of personal income tax to infrastructural development in Lagos state to determine the effect that personal income tax has on infrastructural provisions of the state. The study adopted ex-post facto research design. The study covered Personal



Income Tax and infrastructures development of Lagos State from 1997 to 2018. Secondary data were obtained from Lagos State Internal Revenue Services (LIRS), Lagos State Ministry of budget and planning and Lagos State Ministry of Finance. Data were analyzed using descriptive and inferential statistics. The study found that Personal Income Tax has significant effect on infrastructural development of the state. Given infrastructural provisions; EDH, EDR. On EDH, With Adjusted R² =0.150, F-stat =3.678, and also at 5% significance level [$\beta = 0.380$; P – value = 0.008]. On EDR, Adjusted R² =0.315, F-stat = 3.915, Prob (F-stat) = 0.028), at 5% significance level [$\beta = 0.352$; P – value = 0.154]. The study shows that more government income from PIT was spent on housing infrastructures over other infrastructural provisions.

Owolabi and Awoyinka (2020) examined the effect of federal statutory revenue state allocation on infrastructural development in Ogun State, Nigeria. The study employed ex-post facto research design with ARDL method of analysis and data was sourced from National bureau of statistics, Ogun State Inland Revenue Service, Ogun State Ministry of Finance and Ministry of Budget and Planning. The require time series data was sourced from Ogun State Ministry of Finance within the period of 2000 to 2018 that is 19 years period. The data were collected on the study variables of dependent variables (environment management, youth and social development, education, health, agriculture and transport sectors) and independent variables was federal allocation to Ogun State, Nigeria. Findings revealed that federal statutory revenue state allocation significantly affects environmental management in Ogun State (R² = 64%, t-stat(1,19)=-6.095293, p<0.05); that federal statutory revenue state allocation significantly affects educational development in Ogun State (R² = 73%, t-stat(1,19)=-3.811322, p<0.05); that federal statutory revenue state allocation significantly affects agricultural development in Ogun State (R² = 34%, t-stat(1,19)=-5.707987, p<0.05); that federal statutory revenue state allocation significantly affects health sector in Ogun State (R² = 67%, t-stat(1,19)=-9.379976, p<0.05) and that federal statutory revenue state allocation significantly affects infrastructural development in Ogun State (R² = 77%, F-stat(4,16)=89.68, p<0.05). The study concluded that both in the short and long runs federal statutory revenue state allocation significantly affect infrastructural development in Ogun State.

Hammayo, Shittu And Abdullahi (2020) examined the impact made by the efforts of Bauchi State Government in the development of infrastructure represented by the level of capital expenditure incurred through the utilization of the state's revenue proxied by federal Allocation (FEDALL), internally generated revenue (IGR), debt and other receipts. Secondary data was obtained from the government's Annual Financial Statements for the period 2006 to 2018. Ordinary Least Square regression was employed



as the technique of analysis. The findings of the study revealed that share of allocation received from the federation account as well as debt both had a positive and significant influence in the provision of infrastructure while internally generated revenue, showed a negative and significant relationship. Other receipts comprising of contributions from Local Governments for the execution of joint projects as well as local and foreign grants and assistance received indicated a positive but insignificant relationship.

Ayeni and Afolabi (2020) examined the dynamic relationship between tax revenue, infrastructural development and economic growth in Nigeria, using an annual secondary time series data from 1981 – 2018. The unit root properties of the series were examined using both Augmented Dickey Fuller (ADF) test and Phillip Perron (PP) test, while the Johansen Cointegration test was employed to examine if the series are cointegrated. The results reveal that the series are all integrated of order 1 and non-cointegrated. To examine the direction of causality and the interrelationship among the variables, a vector autoregression (VAR) causality test was carried out, and a VAR at-first difference model was estimated. The results reveal a unidirectional causality running from tax revenue to economic growth and from economic growth to infrastructure, while a bi-directional causality is found between tax revenue and infrastructural development. Findings from the impulse response results show that while tax revenue influences economic growth and infrastructure, infrastructure does not influence economic growth, but significantly influence tax revenue collected.

Oladipo, Efuntade, Olusegun, and Dada (2020) examined foreign direct investment and its impact on revenue generation in Nigeria, with emphases on the role of company income tax as mediating factor. This Study is predicated on the Doctrine of Unbalanced Growth Theory, Solow-Swan growth theory and Romer Growth Model. Secondary data source was explored in presenting the facts of the situation. The secondary data were obtained from relevant literatures, Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics publications among other. In an attempt to do this, ordinary least square regression technique was employed in which T-test, R-Square, Standard Error Test and Durbin Watson test ADF/PP unit root and co-integration test were used in the data analysis, information concerning foreign direct investment, company income tax, petroleum profit tax and corporate tax from 1990-2020 were extracted. The empirical evidence shows that FDI has positive impact on revenue generation in Nigeria. The result of the finding revealed consistence present of co-integration among the variables which is a clear indication that foreign direct investment has a significant and positive relationship with revenue generation with strong emphasize on company income tax as mediating factor. In conclusion, foreign direct investment increase



revenue generation which through company income tax generated to boost economic growth in Nigeria.

Onwuka and Christian (2019) examined revenue generation as a tool for infrastructural development in Nigeria. Time series data were applied in carrying out this research work and the data were sourced from Federal Ministry of Finance, Office of the Accountant General of the Federation, Federal Republic of Nigeria Official Gazettes and the various States' Official Gazettes, Central Bank of Nigeria (CBN) and Nigeria Bureau of Statistics (NBS). Ordinary least square regression analysis was employed in this work with the use of STATA 13 economic package. The scope of the study is basically focused on Nigeria's total revenue generated, infrastructural development and economic growth from 1981 to 2018. The findings of this work reveal that revenue generated have significant effect on infrastructural development in Nigeria. Also, it was concluded that revenue generated have significant effect on economic growth in Nigeria.

Olayinka and Phebe (2019) assessed the impact of internally generated revenue on infrastructural development in Lagos state. Non-experimental research design and secondary data was used in carrying out the study. Data was sourced from State and Local Government Programme (SLGP) Consultants' Report 320 and Lagos state ministry of Planning and Budgeting website from (1996-2015) spanning a period of 20years. Taxes, fines & fees, licenses, earnings and sales were used as proxy for revenue while infrastructural project was applied as proxy for infrastructural development. Data collected were presented in table and the hypotheses were tested using Simple Linear regression technique for analysis and estimating the linear relationship between infrastructural development which is the dependent variable and Revenue which is independent variable. The result showed that there is a significant positive relationship between internally generated revenue and infrastructural development. Taxes, earnings and sales which are major components of internally generated revenue, do not have any significant impact on the infrastructural development of Lagos state. However, licenses, fines and fees have a significant impact on the infrastructural development of the state.

Yunana, Yunana and Muhammad (2019) investigated the impact of Internally Generated Revenue on the development of Local Governments in Kaduna State, a case study of Chikum local government. Structured questionnaire were administered to 125 respondents and the data were analyzed using simple descriptive and spearman rank correction. A major finding of the study was



that internally generated revenue displayed a positive but significant influence on development of Chikum local government.

Olaniyi, Mustapha and Oyedokun (2019) investigated the impact of taxation on government capital expenditure in Nigeria. Secondary data were used and were obtained from Central Bank of Nigeria (CBN) Statistical Bulletin and Federal Inland Revenue Service Website for Period 1994 to 2016. Descriptive statistics was used to describe the variables under investigation, Augmented Dickey Fuller (ADF) Unit Root Test and Johansen Cointegration tests were used to establish the stationarity and long run association among the variables while Error Correction Model (ECM) was used to establish the exact impact of taxation on capital expenditure in Nigeria. The study showed that Company Income Tax (CIT), Petroleum Profit Tax (PPT), Personal Income Tax (PIT) and Education Tax (EDT) have significant financing power on government capital expenditure. Contrarily, Value Added Tax (VAT) and Capital Gains Tax (CGT) are not significant variables affecting government Capital expenditure in Nigeria. However, co-integration result indicated that there was a long-run relationship between tax revenue and government capital expenditure. It was concluded that taxation revenue has significant effect on government capital expenditure in Nigeria.

Okoror, Muhammadu and Uwaleke (2019) examined empirically, the impact of company income tax on infrastructural development in Nigeria. This study adopts an ex-post facto research design. In this study, secondary data retrieved from the CBN statistical bulletin, Federal Inland Revenue Service (FIRS) and National Bureau of Statistics for various years were used. The data covers the period 1981-2017. The data analysis technique that is utilized in this study is the dynamic Least Squares for co-integrated regression. The findings of the study reveal that company income tax is generally not characterized with threatening oscillations year-on-year over the period. The results reveal that the coefficient is positive and statistically significant at 5% level. Therefore, the null hypothesis that CIT has no positive and significant impact on Infrastructural development in Nigeria was rejected.

Mbah and Onuora (2018) examined the Effect of Internally Generated Revenue on Infrastructural Development of the South Eastern States in Nigeria. Ex – post facto design was used in the study. Data used were extracted from budget estimates of each of the five South Eastern States comprising of Imo, Abia, Ebonyi, Enugu and Anambra state from the period 2013-2017. The study employed descriptive statistics, correlation and linear multiple regression for data analysis and data



interpretation. Findings from the study revealed that there a significant relationship between Internal Generated Revenue and the cost of infrastructure in the South East States as at the date of the study.

Umar, Abubakar and Lydia (2018) examined the effect of internally generated revenue on Infrastructural development of Gombe state, whether revenue generation has impacted on Gombe state by providing water, electricity and roads network. To achieve the objectives of the study, a documentary research method was designed, relying on secondary data from hard and electronic copy such as Gombe State internal Revenue Board central data bases, statistical data internal Revenue Board, Gombe State internal Revenue Board officials bulletins, publication on Gombe State internal Revenue Board officials website, Newspaper, Journals and internets site for the period of 2009-2013. The study found that the revenue generation by the state revenue agency was very low as to register any tangible effect on the state budget that rely heavily on allocation from the federation account and other sources. Internally generated revenue has minimal on the infrastructural development of the state, but it has significant impact on the annual expenditure on water, electricity and roads network. The study also revealed that internally generated revenue was economical and tax avoidance and evasion were also insignificant.

Oliver, Edeh, and Chukwuani (2017) examined the effect of Federal Government of Nigeria's Tax resources on infrastructural development of Nigeria. Income from Value Added Tax (VAT), Petroleum Profit Taxes (PPT) were used as proxies for Tax revenues/resources while Infrastructural Development was applied as proxy for Infrastructural Development of Nigeria. The research adopted ex-pos-facto research design as secondary data were used for the analysis. Data were sourced from the Central Bank of Nigeria Statistical Bulletin and the Federal Statistical Bureau. The study covered ten-year period (2006-2015). Data were analyzed using the multiple linear regression technique. The result reveals tax revenue resources (PPT, CIT AND VA3T) had positive and insignificant effect on Infrastructural Development in Nigeria.

3. MATERIAL AND METHOD

This study adopted *Ex-Post Facto* research design. Ex-Post Facto research design is basically concerned with assessing cause and effect relationship among variables. The thirty-six (36) states of the Federal Republic of Nigeria and the Federal Capital Territory, Abuja, constitute the population of this study. This study basically used secondary data. The data for value added tax, petroleum profit tax, company income tax, customs and excise duties and capital expenditure were obtained from publications of Federal Ministry of



Finance and Budget Office, Central Bank of Nigeria (CBN), Federal Inland Revenue Service (FIRS) and National Bureau of Statistics (NBS) for twenty seven (27) years period spanning from 1995-2021.

The independent variable in this study is tax revenue which is decomposed into:

- i. Petroleum Profit Tax (PPT): Obtained from Federal Inland Revenue Service (FIRS) statistical bulletin (various issues).
- ii. Company Income Tax (CIT): Obtained from Federal Inland Revenue Service (FIRS) statistical bulletin (various issues).
- iii. Value Added Tax (VAT): Obtained from Federal Inland Revenue Service (FIRS) statistical bulletin (various issues).
- iv. Custom and Excise Duties: Obtained from Federal Inland Revenue Service (FIRS) statistical bulletin (various issues).

The dependent variable is infrastructural development, which is proxied by:

Capital Expenditure (CAPEX): Collected from the publications of Federal Ministry of Finance and Budget Office, Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics (various issues). The analysis of data for this study were conducted via the aid of E-Views 10.0 statistical software using Coefficient of correlation to measure the degree of relationship between the dependent and independent variables; Augmented Dickey-Fuller (ADF) test to check for stationarity and to find out if the time series data contain a unit root to avoid a spurious result, and the Ordinary Least Square (OLS) regression analysis which explains the degree of effect that the independent variable has on the dependent variable.

3.1 Decision Rule

The null hypothesis is accepted if the p-value of the test is greater than 0.05, otherwise, reject.

3.1 Model Specification

This model adapted the model of Ashiedu, Okafor, Amahalu and Obi, (2022):

$$\text{HDI} = \beta_0 + \beta_1\text{PIT} + \beta_1\text{CIT} + \beta_0 + \beta_1\text{VAT} + \mu$$

HDI = Human Development Index

PIT = Personal Income Tax



This study specifies a functional linear relationship between tax revenue and infrastructural development:

$$Y = f(X) + \mu$$

Thus, consequent upon the adapted the model, the following model was developed:

$$\text{CAPEX} = \beta_0 + \beta_1\text{PPT} + \beta_2\text{CIT} + \beta_3\text{VAT} + \beta_4\text{CED} + \mu$$

Where:

CAPEX	=	Capital Expenditure
PPT	=	Petroleum Profit Tax
CIT	=	Company Income Tax
VAT	=	Value Added Tax
CED	=	Customs and Excise Duties
β_0	=	Constant term (intercept)
β_1 - β_4	=	Coefficient of Tax Revenue
μ	=	Error term (Stochastic Term)

4. RESULT AND DISCUSSIONS

4.1 Data Analysis

Table 1: Descriptive Statistics

	CAPEX	PPT	CIT	VAT	CED
Mean	11.8493	11.9096	11.5548	11.4352	10.6256
Median	11.9100	12.1300	11.7100	11.6000	10.6400
Maximum	12.7300	12.5300	12.2400	11.9300	10.8400
Minimum	10.4900	10.7000	10.7400	10.7500	9.8000
Std. Dev.	0.5116	0.5735	0.5187	0.4325	0.1860
Skewness	-0.5842	0.7273	0.2932	0.3428	-3.2800
Kurtosis	3.4635	2.0968	1.5933	1.4930	15.6761
Jarque-Bera	1.7774	73.2980	92.6132	33.0839	229.1823
Probability	0.4112	0.0000	0.0000	0.0000	0.0000
Sum	319.9300	321.5600	311.9800	308.7500	286.8900
Sum Sq. Dev.	6.8054	8.5503	6.9957	4.8635	0.8993



Observations	27	27	27	27	27
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Source: E-Views 10.0 Descriptive Output, 2023

From Table 1, the standard deviations in the study for the period 1995-2021 are 0.5116, 0.5735, 0.5187, 0.4325 and 0.1860 CAPEX, PPT, CIT, VAT and CED. For such distributions, it is the case that 51.16%, 57.35%, 51.87%, 43.25% AND 18.60% of values are less than one standard deviation (1SD) away from the mean values of CAPEX, PPT, CIT, VAT and CED respectively. Skewness and Kurtosis are contained in Jarque-Bera. Positively skewed is an indication of a rise in profit while negatively skewed is an indication of loss or backwardness. Jarque-bera is used to test for normality; to know whether data are normally distributed. Table 4.1 also shows that, but for CAPEX and CED with the negative values of -0.5842 and -3.2800; all other data are positively skewed. Table 1 further reveals that PPT, CIT, VAT and CED with probability values of 0.0000, 0.0000, 0.0000 and 0.0000 respectively are less than 10%. So invariably, they are significantly normally distributed. While the probability value for CAPEX is not significantly normally distributed because the probability value of 0.4112 is greater than 10%.

Table 2: Pearson Correlation Matrix

	CAPEX	PPT	CIT	VAT	CED
CAPEX	1.0000				
PPT	0.7280	1.0000			
CIT	0.6923	0.8205	1.0000		
VAT	0.7156	0.9292	0.9096	1.0000	
CED	0.0260	-0.0404	0.0278	0.0382	1.0000

Source: Researcher’s computation using E-views 10.0, 2023

The correlation matrix result indicates that CAPEX positively correlates with PPT (0.7280), CIT (0.6923), VAT (0.7156) and CED (0.0260).

4.2. Test of Reliability

This study tested for stationarity unit root test in order to fulfill the econometric theory which states that variables that must enter a regression model must undergo a stationarity test in order to achieve a realistic (non spurious) result at 1%, 5% or 10% level of significance. The result for the test is shown in table 4.3. The data used in this study had unit root problem, consequently, the data were



detrended using Augmented Dickey-Fuller Test. The result of the differenced data in order to solve the unit root problem is shown in Table 3:

Table 3 Differenced Result

Variables	Test Statistic	Test Critical Values			Status	Prob.
		1% level	5% level	10% level		
	ADF				Stationary	
DCAPEX	-4.326744	-3.769597	-3.004861	-2.642242	1(1)	0.0029
DCED	-5.975706	-3.769597	-3.004861	-2.642242	1(1)	0.0001
DCIT	-13.59518	-3.769597	-3.004861	-2.642242	1(1)	0.0000
DPPT	-6.057393	-3.769597	-3.004861	-2.642242	1(1)	0.0000
DVAT	-9.560997	-3.769597	-3.004861	-2.642242	1(1)	0.0000

Source: Researcher's computation using E-view 10.0, 2023

4.2 Hypotheses Testing

Ho₁: Petroleum Profit Tax (PPT) has no significant effect on Capital Expenditure of Nigeria.

Ho₂: Company Income Tax (CIT) has no significant effect on Capital Expenditure of Nigeria.

Ho₃: Value Added Tax (VAT) has no significant effect on Capital Expenditure of Nigeria.

Ho₄: Customs and Excise Duties has no significant effect on Capital Expenditure of Nigeria.



Table 4: Ordinary Least Square Regression Analysis testing the effect of Tax Revenue on Infrastructural Development

Dependent Variable: DCAPEX

Method: Least Squares

Date: 02/06/23 Time: 15:28

Sample (adjusted): 1996 2021

Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.60011	0.856849	12.37104	0.0000
DPPT	0.481341	0.156512	3.075427	0.0060
DCIT	0.602013	0.090927	6.620841	0.0000
DVAT	1.155875	0.210233	5.498068	0.0000
DCED	1.530929	0.222154	6.891307	0.0000
R-squared	0.137488	Mean dependent var		0.085769
Adjusted R-squared	-0.026800	S.D. dependent var		0.221055
S.E. of regression	0.223998	Akaike info criterion		0.016680
Sum squared resid	1.053675	Schwarz criterion		0.258621
Log likelihood	15.74900	Hannan-Quinn criter.		0.086350
F-statistic	66.17109	Durbin-Watson stat		1.634025
Prob(F-statistic)	0.000000			

Source: Researcher’s computation using E- View 10.0, 2023

Table 4 shows the regression result of tax revenue indices and infrastructural development:

CAPEX = 10.60011 + 0.481341PPT + 0.602013CIT + 1.155875VAT + 1.530929CED

It shows that, given a unit increase in PPT, CIT, VAT and CED, CAPEX will increase by 48.1%, 60.20%, 116%, and 153%. The regressed result also shows that CAPEX relates positively with PPT (β1=0.481341); CIT (β2=0.602013); VAT (β3=1.155875); and CED (β4=1.530929). The probability value for the slope coefficient shows that P(x1=0.0060<0.05; x2= 0.0000<0.05; x3= 0.0000<0.05; x4= 0.0000<0.05). This implies that PPT, CIT, VAT and CED have a statistically significant relationship with CAPEX at 5% significance level.

The R-squared of 0.726800 suggests that variation in CAPEX is explained by PPT, CIT, VAT and CED fluctuation by 72.68% while the remaining 27.32% is explained by other factors outside the



model. The result shows that there is a significant positive relationship between PPT, CIT, VAT, CED and CAPEX.

4.2.1 Decision

The value of F-statistic = 66.17109 with the associated probability of 0.000000 is less than the significance level of 0.05; the null hypothesis is therefore rejected at 5% level of significance implying that tax revenue has a significant and positive effect on CAPEX of Nigeria.

The regressed result shows that CAPEX relates positively with PPT ($\beta_1=0.481341$); CIT ($\beta_2=0.602013$); VAT ($\beta_3=1.155875$); and CED ($\beta_4=1.530929$). The probability value for the slope coefficient shows that $P(x_1=0.0060<0.05$; $x_2= 0.0000<0.05$; $x_3= 0.0000<0.05$; $x_4= 0.0000<0.05$). The R-squared of 0.726800 suggests that variation in CAPEX is explained by PPT, CIT, VAT and CED fluctuation by 72.68% while the remaining 27.32% is explained by other factors outside the model. The result shows that there is a significant positive relationship between PPT, CIT, VAT, CED and CAPEX. The value of F-statistic = 66.17109 with the associated probability of 0.000000 is less than the significance level of 0.05; the null hypothesis is therefore rejected at 5% level of significance implying that tax revenue has a significant and positive effect on CAPEX of Nigeria.

The findings of this study is consistent with the results of Owolabi and Awoyinka (2020), Tanko and Shishi (2020), Oladipo, Efuntade, Olusegun, and Dada (2020), Olaniyi, Mustapha and Oyedokun (2019) but negates the findings of Obi, Emenike and Chukwurah (2021), Hammayo, Shittu and Abdullahi (2020) Ayeni and Afolabi (2020).

CONCLUSION AND RECOMMENDATIONS

This study explored the relationship between tax revenue and infrastructural development in Nigeria for twenty seven (27) years covering from 1995 – 2021 periods. Existing literature shows that researchers are yet to reach a consensus about the degree of relationship between tax revenue measurements and infrastructural development in Nigeria. Therefore, the relationship and effect thereof, is yet to be well established. This study has contributed to the research effort at empirical measure of the relationship between tax revenue and infrastructural development. Data analysis revealed that a relationship exists between tax revenue variables and infrastructural development, and that tax revenue indices exerted significant relationship with infrastructural development component. As disaggregated components, PPT, CIT, VAT and CED exerted positive relationship with capital expenditure. However, the aggregated effect of tax revenue on infrastructural



development is statistically significant at 5% level. Consequently, this analysis supports growing evidence that tax has a relationship with and exerts significant effect on infrastructural development.

Based on findings from the empirical analysis, the study proffers the following recommendations:

1. Government should put in place adequate measure to ensure that revenue generated from PPT is effectively utilized to develop and grow the economy through proper infrastructural development.
2. Considering the positive relationship between CIT and capital expenditure, government should put strict punitive measures in place to sanction corrupt officials as well as establishments that refuses to remit collected CIT funds.
3. The positive influence of VAT on the economy can be sustained and enhanced if efforts are made by the government and its relevant agencies to exempt infant industries from VAT payment over reasonable period.
4. Government should develop an effective measure on the collection, keeping and analyzing of records of imported and exported goods and services to be geared towards infrastructural development in Nigeria.

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