TAX REVENUE AND INFRASTRUCTURE EXPECTATION GAP IN SELECTED SUB-SAHARAN AFRICAN COUNTRIES

Daniel-Adebayo Olugbenga
Department of Accounting, School of Management Sciences, Babcock University, Ilishan-Remo, Nigeria
E-mail: danieladebayoolugbenga@gmail.com

Akintoye Ishola Rufus
Department of Accounting, School of Management Sciences, Babcock University, Ilishan-Remo, Nigeria
E-mail: irakintoye@babcock.edu.ng

Adegbie Folajimi Festus
Department of Accounting, School of Management Sciences, Babcock University, Ilishan-Remo, Nigeria
E-mail: fadegbie@babcock.edu.ng

Ajayi-Owoeye Ayooluwa Olotu
Department of Accounting, School of Management Sciences, Babcock University, Ilishan-Remo, Nigeria
E-mail: olotua@babcock.edu.ng

ABSTRACT

The adequate provision of infrastructure is seen as an agent of growth in countries all over the world. However, Sub-Saharan African countries are struggling with great developmental challenges attributable to infrastructural deficiencies. The study found that tax revenue jointly had significant effect on the total infrastructural expectation gap in Sub-Sahara Africa ($Adj.R^2 = 0.51$, $W(4, 263) = 63.01$, $p < .05$). The study concluded that tax revenue influenced infrastructural expectation gap in Sub-Saharan African countries. It was recommended stakeholders' interest should be prioritized when making strategic decisions to reduce the infrastructural expectation gap in these countries.

Keywords: Infrastructural Expectation Gap, Public Infrastructure, Tax Revenue.

JEL Classification: H20, O29

1.0. INTRODUCTION

The need for the government to provide infrastructures such as water supply, good transportation systems at various levels, energy, and telecommunication cannot be overemphasized because it stimulates economic growth by facilitating investment and trade, driving enterprise opportunities, engendering employment, and providing the less privileged with access to basic amenities to earn a living has been truncated owing to lack of infrastructures. There is an infrastructure expectation gap when some basic amenities are not made available to the stakeholders and/or the availability of such did not capture all the relevant and underlying economic realities on the ground, hence it does not justify the tax revenue being generated and does not comprehensive enough in meeting stakeholders' expectations of the utilization of the tax revenue being generated in that economy (Alawi, Wadi & Kukreja, 2018).

The suitable delivery of infrastructure is crucial for economic and common development across Africa. Metcalfe and Valeri (2019) defined the term infrastructure gap as the difference between the needed investment in infrastructure and the means (resources) available to cater to that infrastructural need. Understanding the infrastructure gap can be approached in two dimensions which include a notional, quantifiable investment gap and a subjective, needs-based service gap. Adequate tax income and proper utilization of tax revenue give room for the government to finance and fulfill the infrastructural expectation of the populace in terms of the amount invested in the infrastructure (Emmanuel & Ibrahim, 2020; Yahayah & Yusuf, 2019). Thus, ensuring proper and adequate utilization of tax revenue in achieving infrastructural development is very important to develop, developing, and under-developed countries as stakeholders have high expectations of the government hence demands accountability on how the budgeted amount on infrastructures for a particular period translates to the actual investment at the end of that period. From 2016 through 2030, the world needs to invest about 3.8 percent of GDP, or an average of $3.3 trillion a year, in economic infrastructure just to support expected rates of growth (Front, 2020). Emerging economies account for some 60 percent of that need. But if the current trajectory of underinvestment continues, the world will fall short by roughly 11 percent, or $350 billion a year (Robert, Matthew & Mark, 2020).

The availability of adequate and efficient infrastructures will not only improve the quality of life of the people but also promotes rapid industrialization. Asaolu, Olabisi, Akinbode, and Alebiosu, (2018) posited that the provision of adequate infrastructure in an economy will foster development, increase the tax base, and thus, raise revenue to finance capital projects. The development of infrastructure in Africa is critical for fostering economic growth and improving the living standards of Africans. Unfortunately, most African countries have a gross domestic product to tax at a level as low as 6% (Adeosun, 2017) which is evident that there is an infrastructural deficit because the government could not adequately raise revenue to meet the expectation of citizens or stakeholders in terms of infrastructure. In the same vein, Adegbie and Daniel-Adebayo (2017) submitted that the utilization of tax revenue disturbs the capability of the government to make available the indispensable infrastructure which can lead to the growth of the economy.

Chukwuebuka and Jisike (2020) opined those Sub-Saharan African economies are being sabotaged owing to the present state of infrastructure deficiencies against the tax revenue that is being generated which has been seen as a major source of government revenue all over the world. This has affected the industrial sector of these economies with low production capacity, discouraging foreign or local investors, as well as the reduction in the gross domestic product (Ibanichuka, Akani, & Ikebujo, 2016) and consequently creating a gap in the expectations of

stakeholder with respect to the provision of the basic amenities needed to at least achieve a modest standard of leaving and ease of doing business in these environments.

A number of studies have been done in this line of research (Ayeni, & Afolabi, 2020; Ajiteru, Adaranijo, & Bakare, 2018; Anyaduba & Aronmwan, 2015; Mbah & Onuorah, 2018; Oladipupo & Ibadin, 2016; Okwara & Christian, 2019; Oliver, Edeh, & Chukwuani, 2017; Ejemai, Akintoye, Adegbie, 2020; Okoror, Nwaleke, Mainoma & Oyedokun, 2019; Rasulovich, Oripovich & Rasulovich, 2020) but none of these studies have been conducted in Sub-Saharan Africa. Sequel to the aforementioned, this study bridged this gap by investigating the effects of tax revenue on the infrastructure expectation gap in selected Sub-Saharan African countries.

2.0. LITERATURE REVIEW

2.1. Infrastructure and Infrastructure Expectation Gap

Although there is yet no universally accepted definition of infrastructure, a common thread going across almost all of the definitions is the idea that infrastructure refers to capital goods provided with a long-term perspective, facilitated by either government or the private sector. Infrastructure can be referred to as physical and organizational structures and facilities considered crucial in ensuring the security of any nation, its public health, safety, and its economic growth. In the words of Okwara and Christian (2019), it was explained that infrastructure is a basic physical and organizational structure needed for the operation of a society or enterprise, or the service and facilities necessary for an organization to function. In congruence, Amadi and Alolote (2020) see Infrastructure as those socio-economic amenities that promote or facilitate economic growth.

The stakeholders desire some legitimate expectations from the government of the country to where they have made some rewardable contributions, and incidentally, these expectations are genuine and natural; effective governance, provision of basic amenities (infrastructure), proper utilization of tax revenue, putting the stakeholders' interest in the right perspective when making strategic decisions. There is an infrastructure expectation gap when some basic amenities are not made available to the stakeholders and/or the availability of such did not capture all the relevant and underlying economic realities on the ground, does not justify the tax revenue being generated, and is not comprehensive enough in meeting shareholders' expectations of the utilization of the tax revenue being generated in that economy (Alawi, Wadi & Kukreja, 2018). That government seems not to understand the needs of the stakeholders since they are not making concerted efforts towards closing these shareholders' expectation gap as evident by the current economic realities of dilapidated infrastructures in Sub-Saharan African countries. In most cases, this evidence of current economic reality against the expectations of the stakeholders when compared with the performance of the government in the utilization of tax revenue for the provision of infrastructure creates stakeholders' infrastructure expectation gaps. Metcalfe and Valeri (2019) defined the term infrastructure gap as the difference between the needed investment in infrastructure and the means (resources) available to cater to that infrastructural need.

2.2. Tax Revenue

As stated by Merriam-Webster, (1828) "revenue is the yield of sources of income (such as taxes) that a political unit (such as a nation or state) collects and receives into the treasury for public use" (Olayinka & Phebe, 2019). Revenue is defined as the total amount of earnings that

accrue to an organization to assist in financing its activities (Olunga & Solomon, 2019). It has also been identified as all amounts of money generated as income sources by a government from various sources, for example, taxes, fines, and licences (Carfora, Pansini & Pisani, 2018). Tax revenue has been seen as a major source of government revenue all over the world (Oladipupo, & Ibadin, 2015). It is the revenue collected from taxes on income and profits, social security contributions, levies on goods and services, payroll taxes, taxes on the ownership and transfer of property, and other taxes (Okwara & Amori, 2017). It can also be regarded as one measure of the degree to which the government controls the economy's resources (Yahaya & Bakare, 2018; Zayol, Terlumun & Johnson, (2017). The present study considered companies income tax and personal income tax as a measure of direct tax while value-added tax and custom and excise duties as indirect taxes.

2.3. Theoretical Framework

This study is hinged on the Theory of Public Economy and Social Contract Theory

2.3.1. Theory of Public Economy

The theory was propounded by Friedrich Von Wieser, a German in 1924. The public economy could also be referred to as the national household, public household, or country household. The theory holds that the public economy is viewed by classical theory as an economic relationship existing between the state and its citizens whereby the citizens pay taxes in exchange for public goods or services.

Scholars in the literature, such as Agenor (2006), have submitted the literature that public and private economies are related; they both have common roots and similar aims. They both have the same objective of maximization of the utility of scarce resources. But the public economy has its specific means of power, which it uses to solve its specific problems in a special way. The best way to describe the economic structure of a state is by starting with public expenditure (Musgrave and Peacock, 1967). Public investment in infrastructure should be enhanced because infrastructure services have a direct impact on production costs, the rate of return on capital, and the productivity of private inputs. Also, infrastructure indirectly affects growth through different means. Critics of public economic theory, such as Wagstaff and Cleason (2004) have expressed their views that do not align with the principle underlying the beliefs of the theory. They submitted that although government should provide for public goods and services, it is not under any obligation to utilize the tax revenue solely for such. That the citizens are not expected to see a payment of taxes as an exchange or bargaining power for public goods or services. There are other obligations to be met with tax revenue aside provision of public goods and services.

The significance of the theory of public economy to the current study is based on its principle which advocates that taxpayers' funds should be invested in infrastructure that will benefit them and meet their expectations with due reference to the fact that there are utilities that need to be maximized. Also, the theory is premised on the fact it shows the interconnectivity between revenues generated from taxes and the expectation of stakeholders in meeting the required budgeted infrastructure per time. Consequently, when the expectations of stakeholders regarding infrastructure in a particular country are met, stakeholders are better motivated to voluntarily contribute their quota rather than avoiding or evading tax as a result of not getting value for their contribution to the revenue (Igga, 2018).

2.3.2. Social Contract Theory

The social contract's philosophical idea is attributable to Hugo Grotius (1583-1645), Thomas Hobbes (1588-1679), John Locke (1632-1704), Jean Jacques Rousseau (1712-88), and in recent times to John Rawls. Conversely, another school of thought holds that the concept of the social contract is traceable to Italian Marsilius of Padua (1270-1343) in the legal and political debate.
The theory is premised on the formation of societies and governments. The theory propounds that the basis of all political power is the people and the government is said to be by their consensus and mandate.
Social contract theory views society as a series of social contracts. The theory emphasizes the fact that there exists between society and the members of society a social contract (Gray, Owen & Adams, 1996). This theory sees corporate social responsibility as a contractual obligation between a firm and its host community (Donaldson, 1983). A comprehensive social contract theory was propounded by Donaldson and Dunfee (1999); to them, managers should make ethical decisions. A social contract is a fundamental principle of a legitimate government institution because it provides a clear understanding of a rational explanation of the origin of a state (Falaiye & Okeregbe, 2016).

The social contract theory is relevant to the current discourse owing to the fact that social contract theory holds that government is under an obligation to improve the status of society. Every government is required to have in mind the interests of its citizenry without breaking the rules of justice in society. The relevance to the present discourse is also premised on the fact that it agrees that individuals, by nature, are free and equal, and agree to renounce part of their natural liberty by entering into civil society and constituting a political authority to which they subject themselves for the sake of the advantages provided by civil society. It mainly worked in accordance with the principle that governments delivered social and economic benefits to citizens.

3.0. METHODOLOGY

The study *ex-post facto* research design using the panel data set. The population for this study consisted of forty-eight (48) Sub-Saharan African (SSA) countries as listed in the World Bank classification of Sub-Saharan African countries for the period 2007-2020. The choice of the periods was informed by the availability of data for the study, the country's gross domestic product accounts for more than 50 percent of the sub-Saharan African countries, and the issue of infrastructural decay around this period across Sub-Sahara African countries. The sample size of the study is made up of five (5) Sub-Saharan African countries which include Nigeria, Kenya, Rwanda, Ghana, and South Africa as contained in the World Bank classification of Sub-Saharan African countries into four economic categories of oil exporting countries, middle-income class, fragile countries, and non-fragile low-income countries by way of purposive sampling technique.
Data for the research instrument was sourced from published secondary sources such as Tax Authority annual reports of the selected countries, World Development Indicators, Global Infrastructural Hub, International Monetary Fund (IMF) World Statistics Books, Central Bank annual reports of the selected countries, and African Development Bank Statistical Book within the period of 2007 to 2020. The infrastructure investment gap is dependent on a set of data created by the G20's Global Infrastructure Hub and sets a self-improving metric, which employed a yardstick against a country's peers (GHI and Oxford Economics 2018).

The study analyzed the data collected with descriptive and inferential statistics. STATA Statistical package software was employed. The study made use of the System General Method of Moment panel regression to analyze the data collected. The stated hypothesis in this research was tested with the use of the Wald chi-square test. The Wald chi-square test is appropriate because it tests for significant differences between the means of more than two comparing variables used.

The estimation method applied in this study is the System Generalized Method of Moments. The rationale for using this approach was based on the nature of the study which requires taking care of individual cross-sectional units' specific heterogeneity, and autocorrelation problem as a result of the included previous values of the dependent variables as one of the regressors which the static panel of Pooled OLS, Random effect model and the fixed effect model are not able to handle and as such will require a dynamic panel.

3.1. Description and Measurement of Variables

This study adopted the explanatory variables of Companies Income Tax (CIT), Value Added Tax (VAT), Custom and Excise Duty (CED), and Personal Income Tax (PIT) which are properly operationalized in this study on the premise that economic theory does not indicate the functional form of any relationship. This means that economic theory does not state whether a relationship will be expressed in linear form, quadratic form, or in cubic form. On the strength of the above, the study specifies the relationship between tax revenue and stakeholders' expectation gaps on infrastructure. The variables of the study were sufficiently adapted in the works of (Abomaye-Nimenibo, William, Michael, Mini & Friday, 2018; Ayeni & Afolabi, 2020; Metcalfe & Valeri, 2019; Ejemai, Akintoye & Adegbie, 2020).

Table 3.1 Measurement and Justification of Variables

Symbols	Variables	Measurement of Variables	Justification
Dependent Variable			
IEG	Infrastructural Expectation Gap (Infrastructural investment expectation gap)	The sum of the difference on budget amount and the actual investment amount in on transportation, energy, water and telecommunication infrastructure needs	Hammayo, Shittu and Abdullahi (2020), Metcalfe and Valeri (2019), Ayodele,Alao, Ogunjuyigbe, and Munda, (2019).
Independent variables			
CIT	Companies' Income Tax	Tax chargeable on the total profit of any corporate entity registered in Nigeria at the rate of 30%.	Ejemai, Akintoye and Adegbie (2020)
VAT	Value Added Tax	Tax paid by consumers on all goods and services at 7.5%.	Eneje (2018) Ayeni, Ibrahim and Adeyemi (2017).

CED	Custom and Excise Duty	Customs duties are taxes that must be paid to the government when goods are brought in (imported) from or exported to other countries	Abomaye-Nimenibo, William, Michael, Mini and Friday (2018)
PIT	Personal Income Tax	Personal Income Tax (PIT) is a direct tax levied on personal income including wages and salaries of individuals.	Amin, Chen and Huang (2018)

Source: Researcher's Compilation, (2022)

3.2. Model Specification

This section presents the model for testing the research hypotheses formulated. This study adapted the model by (Abomaye-Nimenibo, William, Michael, Mini & Friday, 2018; Amos, Uniamikogbo & Aigienohuwa, 2017; Amin, Chen & Huang, 2018; Ayeni & Afolabi, 2020; Metcalfe and Valeri (2019), Ejemai, Akintoye & Adegbie, 2020) which considered two groups of variables. Namely, the dependent and independent variables, the independent variable is tax revenue which was subdivided into direct tax which was measured using companies Income Tax (CIT) and Personal Income Tax (PIT) while the indirect tax was measured using Value Added Tax (VAT) and Custom an Excise Duty (CED). The dependent variable Stakeholders' infrastructural expectation gap (IEG) was measured using the Stakeholders' infrastructure investment expectation gap approach and proxied by Transportation Infrastructural Expectation Gap (TIEG), Energy Infrastructural Expectation Gap (EIEG), Telecommunication Infrastructural Expectation Gap (TEIEG) and Water Infrastructural Expectation Gap (WIEG). The model is stated hereunder:

From the hypothesis stated above, the functional relationships of the variables are as follows:
$Y = f(X)$
Where:
Y = Dependent Variable
X = Independent Variable
Where:
Y = Infrastructure Expectation Gap (IEG)
X = Tax Revenue (TR)
x_1= Companies' income tax (CIT)
x_2 = Personal income tax (PIT)
x_3 = Value added tax (VAT)
$x_{4=}$ Custom and excise duty (CED)
Where:
Y_{t-1} = The lag of Stakeholders' Infrastructure Expectation Gap (IEG_{t-1})
y_{1t-1} = The lag of Transportation Infrastructure Expectation Gap ($TIEG_{t-1}$)
y_{2t-1} = The lag of Energy Infrastructure Expectation Gap ($EIEG_{t-1}$)
y_{3t-1} = The lag of Water Infrastructure Expectation Gap ($WIEG_{t-1}$)
y_{4t-1} = The lag of Telecommunication Infrastructure Expectation Gap ($TEIEG_{t-1}$)

MODEL

$$IEG_{it} = \alpha_0 + \beta_1 IEG_{it-1} + \beta_2 CIT_{it} + \beta_3 PIT_{it} + \beta_4 VAT_{it} + \beta_5 CED_{it} + \varepsilon_{it}$$

4.0. RESULTS AND DISCUSSION OF FINDINGS

The panel data regression result used in examining the effect of tax revenue on the infrastructure expectation gap in Sub-Saharan African countries is discussed in the section.

4.1. Descriptive Statistics

4.1.1. Tax Revenue and Infrastructural Expectation Gap

Quarterly data for fourteen years from 2007-2020 for five (5) Sub-Saharan African countries were used in the study. The descriptive statistics presented in table 4.1 are the mean, maximum, minimum, and standard deviations, and the numbers of observations for each of the dependent and independent variables. The dependent variable is Infrastructural Expectation Gap (IEG) and is further classified into Transportation Infrastructural Expectation Gap (TIEG), Energy Infrastructural Expectation Gap (EIEG), Water Infrastructural Expectation Gap (WIEG) and Telecommunication Infrastructural Expectation Gap (TEIEG). The independent variables are Company Income Tax (CIT), Personal Income Tax (PIT), Value Added Tax (VAT) and Custom and Excise Duties (CED).

Table 4.1: Descriptive Statistics of Tax Revenue and Infrastructural Expectation Gap

Variables	Mean	Maximum	Minimum	Std. Dev.	Obs.
IEG	223.586	1651.893	-210.156	444.608	280
TIEG	121.253	856.111	-111.451	256.992	280
EIEG	52.639	452.427	-56.508	126.408	280
WIEG	9.659	73.732	-9.575	20.701	280
TEIEG	40.034	343.356	-42.197	85.053	280
CIT	1215.663	5209.986	10.647	1609.017	280
PIT	1800.534	9314.367	19.314	3043.390	268
VAT	64.434	434.527	1.408	127.644	280
CED	1381.060	11337.030	11.618	2301.662	280

Source: Researcher`s computation (2022)

Notes: Table 4.1 shows the mean, maximum, minimum, and standard deviation of the variables. The dependent variable is Infrastructural Expectation Gap (IEG) and is further classified into Transportation Infrastructural Expectation Gap (TIEG), Energy Infrastructural Expectation Gap (EIEG), Water Infrastructural Expectation Gap (WIEG), and Telecommunication Infrastructural Expectation Gap (TEIEG). The independent variables are Company Income Tax (CIT), Personal Income Tax (PIT), Value Added Tax (VAT), and Custom and Excise Duties (CED). All the variables are in million of dollars except the government policy on taxation and corruption perception index which are indexes. All the values were derived from the 280 country-year observations for five sub-Saharan African countries. The estimation process was facilitated using EViews 10.

From Table 4.1, **IEG** has a mean value of 223.586. The mean value suggests that on average the infrastructural expectation gap of the selected sub-Saharan African countries is 223.586 million dollars. The standard deviation of 444.608 connotes that there is a dispersion of the infrastructural expectation gap from the mean to around 444.608 percent. Thus, the standard deviation value is far-off from the mean, signifying that the infrastructural expectation gap is

highly susceptible to modification in the long run. The minimum value of -210.156 and maximum value of 1651.893 indicate that the selected sub-Saharan African countries have different levels of the infrastructural expectation gap. This further implies that while some sampled sub-Saharan African countries are experiencing a negative infrastructural expectation gap at around 210.156 million dollars, others experience a positive infrastructural expectation gap at around 1651.893 million dollars.

The transportation infrastructural expectation gap has a mean value of 121.253. The mean value suggests that on average the transportation infrastructural expectation gap of the selected sub-Saharan African countries is 121.253 million dollars. The standard deviation of 256.992 connotes that there is a dispersion of the transportation infrastructural expectation gap from the mean to around 256.992 percent. Thus, the standard deviation value is far-off from the mean, signifying that the transportation infrastructural expectation gap is highly susceptible to modification in the long run. The minimum value of -111.451 and maximum value of 856.111 indicate that the selected sub-Saharan African countries have diverse levels of transportation infrastructural expectation gap. This further implies that while some sampled sub-Saharan African countries are experiencing a negative transportation infrastructural expectation gap of around 111.451 million dollars, others experience positive transportation infrastructural expectation gap at around 856.111 million dollars.

The energy infrastructural expectation gap has a mean value of 52.639. The mean value suggests that on average the energy infrastructural expectation gap of the selected sub-Saharan African countries is 52.639 million dollars. The standard deviation of 126.408 connotes that there is a dispersion of the energy infrastructural expectation gap from the mean to around 126.408 percent. Thus, the standard deviation value is far-off from the mean, signifying that the energy infrastructural expectation gap is highly susceptible to modification in the long run. The minimum value of -56.508 and maximum value of 452.427 indicate that the selected sub-Saharan African countries have diverse levels of energy infrastructural expectation gap. This further implies that while some sampled sub-Saharan African countries are experiencing a negative energy infrastructural expectation gap at the level of 56.508 million dollars, others experience a positive energy infrastructural expectation gap at around 452.427 million dollars.

The water infrastructural expectation gap has a mean value of 9.659. The mean value suggests that on average the water infrastructural expectation gap of the selected sub-Saharan African countries 9.659 million dollars. The standard deviation of 20.701 connotes that there is a dispersion of the water infrastructural expectation gap from the mean to around 20.701 percent. Thus, the standard deviation value is far-off from the mean, signifying that the water infrastructural expectation gap is highly susceptible to modification in the long run. The minimum value of -9.575 and maximum value of 73.732 indicate that the selected sub-Saharan African countries have diverse levels of water infrastructural expectation gap. This further implies that while some sampled sub-Saharan African countries are experiencing a negative water infrastructural expectation gap at the level of 9.575 million dollars, others experience a positive water infrastructural expectation gap at about 73.732 million dollars.

The telecommunication infrastructural expectation gap has a mean value of 40.034. The mean value suggests that on average the telecommunication infrastructural expectation gap of the selected sub-Saharan African countries is 40.034 million dollars. The standard deviation of 85.053 connotes that there is a dispersion of the telecommunication infrastructural expectation gap from the mean to around 85.053 percent. Thus, the standard deviation value is far-off from the mean, signifying that the telecommunication infrastructural expectation gap is highly

susceptible to modification in the long run. The minimum value of -42.197 and maximum value of 343.356 indicate that the selected sub-Saharan African countries have diverse levels of telecommunication infrastructural expectation gap. This further implies that while some sampled sub-Saharan African countries are experiencing a negative telecommunication infrastructural expectation gap of about 42.197 million dollars, others experience a positive telecommunication infrastructural expectation gap of around 343.356 million dollars.

Company income tax has a mean value of 1215.663. The mean value suggests that on average the company income tax of the selected sub-Saharan African countries is 1215.663 million dollars. The standard deviation of 1609.017 connotes that there is a dispersion of the company income tax from the mean to around 1609.017 percent. Thus, the standard deviation value is far-off from the mean, signifying that the company income tax is highly susceptible to modification in the long run. The minimum value of 10.647 and maximum value of 5209.986 indicate that the selected sub-Saharan African countries have diverse levels of company income tax. This further implies that while some sampled sub-Saharan African countries are experiencing low company income tax at around 10.647 million dollars, others experience high company income tax at about 5209.986 million dollars.

Personal income tax has a mean value of 1800.534. The mean value suggests that on average the personal income tax of the selected sub-Saharan African countries is 1800.534 million dollars. The standard deviation of 3034.390 connotes that there is a dispersion of the personal income tax from the mean to around 3034.390 per cent. Thus, the standard deviation value is far-off from the mean, signifying that the personal income tax is highly susceptible to modification in the long run. The minimum value of 19.314 and maximum value of 9314.367 indicate that the selected sub-Saharan African countries have diverse levels of personal income tax. This further implies that while some sampled sub-Saharan African countries are experiencing low personal income tax at around 19.314 million dollars, others experience high personal income tax at about 9314.367 million dollars.

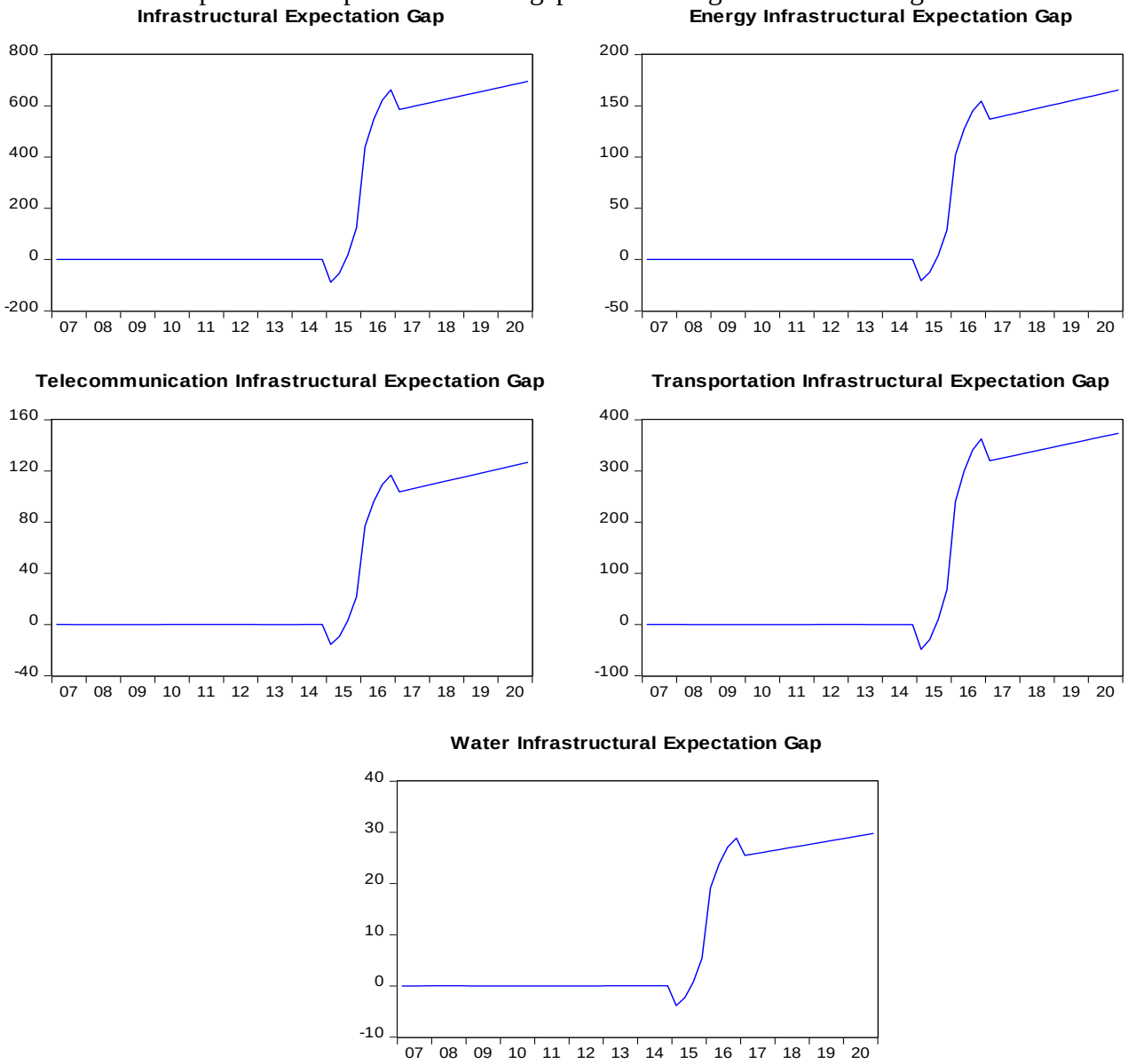
Value-added tax has a mean value of 64.434. The mean value suggests that on average the value-added tax of the selected sub-Saharan African countries is 64.434 million dollars. The standard deviation of 127.644 connotes that there is a dispersion of the value-added tax from the mean to around 127.644 percent. Thus, the standard deviation value is far-off from the mean, signifying that the value-added tax is highly susceptible to modification in the long run. The minimum value of 1.408 and maximum value of 434.527 indicate that the selected sub-Saharan African countries have different levels of value-added tax. This further implies that while some sampled sub-Saharan African countries are experiencing low value-added tax at about 1.408 million dollars, others experience high value-added tax at around 434.527 million dollars.

Custom and excise duties have a mean value of 1381.060. The mean value suggests that on average the custom and excise duties of the selected sub-Saharan African countries are 1381.060 million dollars. The standard deviation of 2301.662 connotes that there is a dispersion of the custom and excise duties from the mean to around 2301.662 percent. Thus, the standard deviation value is far-off from the mean, signifying that the custom and excise duties are highly susceptible to modification in the long run. The minimum value of 11.618 and maximum value of 11337.030 indicate that the selected sub-Saharan African countries have different levels of customs and excise duties. This further implies that while some sampled sub-Saharan African countries are experiencing low customs and excise duties at about 11.618 million dollars, others experience high customs and excise duties at around 11337.030 million dollars.

4.1.2. Descriptive Statistics using Graphs

4.1.2.1. Graphical Description of Infrastructural Expectation Gap

Figure 4.1 presents the plots of all the proxies of the infrastructural expectation gap of energy, telecommunication, transportation, water, and the overall total. The graph shows similar behavioural patterns across space and time, but a look at the plot shows that although they exhibit similar patterns the values in monetary terms differ across all the measures of energy, telecommunication, transportation, water, and the overall total infrastructural expectation tax. In addition, between the first quarter of 2007 and the second quarter of 2014, the value was a bit above 1 million dollars, however, infrastructural expectation gaps for energy, telecommunication, transportation, water, and the overall total increased astronomically to the third quarter of 2014 and later fell in the second quarter of 2018 and later on it maintained continuous growth. This suggests that the infrastructural expectation gaps of the selected sub-Saharan African countries have been on the rise, hence the need for the government of these countries to take proactive steps to reduce the gaps so as to engender economic growth.

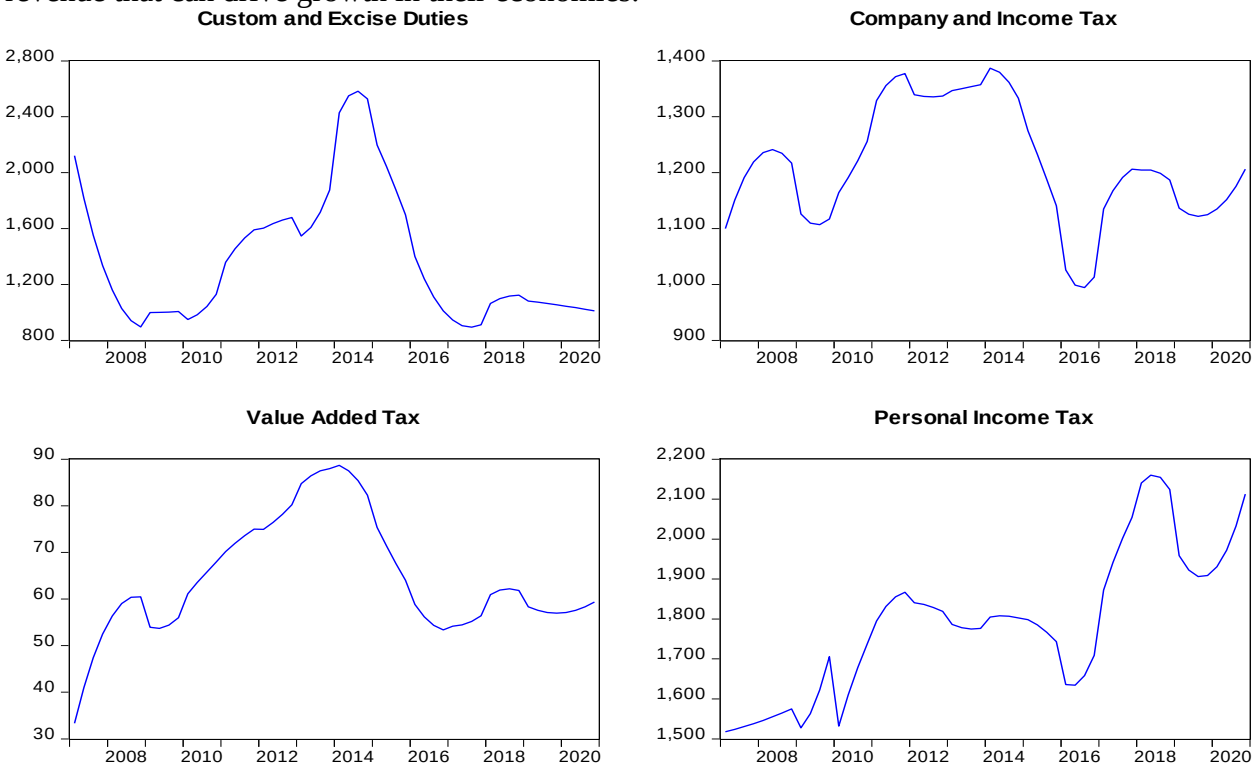


Source: Researcher's Fieldwork Result Analysis (2022)

Figure 4.1: Graph of Infrastructural Expectation Gap 2007Q1 – 2020Q4

4.1.2.2. Graphical Description of Tax Revenue

Figure 4.2 depicts the average tax revenue for the selected sub-Saharan African countries for the period 2007Q1 – 2020Q4. The patterns of the custom and excise duties are not stable, it fell in the second quarter of 2001 to the third quarter of 2008 and later rose thereafter, up until the second quarter of 2014 that it fell sharply and this has been falling thereafter. The company income tax also is not stable, there is evidence of revenue oscillation from the corporate institutions as well it reached its peak in the third quarter of 2013 and later fell thereafter. The value added tax for most of the period was on the increase and fell sharply in the third quarter of 2013 and thereafter has been constant over time. Lastly, the personal income tax is also not constant, for most of the period covered there is an up and down in the PIT. On the overall, this is a wake-up call to governments of these countries to intensify their revenue drive so as raise revenue that can drive growth in their economies.



Source: Researcher's Fieldwork Result Analysis (2022)
Figure 4.2: Graph of Tax Revenue 2007Q1 – 2020Q4

4.2. Hypothesis Testing

Research Objective: examine the effect of tax revenue on infrastructural expectation gap in selected sub-Sahara African countries.
Research Question: Does tax revenue have effect on infrastructural expectation gap in selected countries of sub-Sahara Africa?
Research Hypothesis: Tax revenue has no significant effect on infrastructural expectation gap in selected countries of sub-Saharan Africa.

Table 4.2 Tax Revenue and Infrastructural Expectation Gap in Sub-Saharan Africa
Dependent Variable: IEG

Variable	Coefficient	Corrected Standard Error	Z-test	Prob.
Constant	0.223	1.878	0.119	0.905

L.IEG	0.832***	0.291	2.864	0.007
CIT	-0.646***	0.133	-4.869	0.000
PIT	0.046	0.550	0.084	0.933
VAT	0.022	0.132	0.165	0.869
CED	0.126***	0.018	6.871	0.000

Observations	263
Adjusted R^2	0.512
Number of group	5
Wald chi-square	63.01 (0.000)
AR1 test	-7.44 (0.000)
AR2 test	-0.18 (0.858)
Hansen test	3.07 (0.382)
Sargan test	1.45 (0.657)

Source: Researcher`s computation (2022)

Notes: Table 4.7 reports System General Method of Moment (SGMM) regression results of the effects of tax revenue on the infrastructural expectation gap of Sub-Saharan Africa countries**.** The dependent variable is Infrastructural Expectation Gap (IEG). The independent variables are Company Income Tax (CIT), Personal Income Tax (PIT), Value Added Tax (VAT), and Custom and Excise Duties (CED). * Significant at 10%, ** Significant at 5%, *** Significant at 1%.

$$IEG_{it} = \beta_0 + \beta_1 IEG_{it-1} + \beta_2 CIT_{it} + \beta_3 PIT_{it} + \beta_4 VAT_{it} + \beta_5 CED_{it} + \varepsilon_{it}$$

$$IEG_{it} = 0.223 + 0.832 IEG_{it-1} - 0.646 CIT_{it} + 0.046 PIT_{it} + 0.022 VAT_{it} + 0.126 CED_{it}$$

Z-test = 0.119 2.864 -4.869 0.084 0.165 6.871

Interpretation

In the determination of the suitability of the parameter estimates for the Model which examined the impact of tax revenue on the infrastructural expectation gap of Sub-Saharan African countries, the post-estimation tests from the System General Method of Moment were used. Four categories of the test are normally considered in an ideal situation and they are the serial correlation of first autoregressive order, the serial correlation test of second autoregressive order; the *Hansen test* of over-identifying restrictions and the Sargan test that the specified variables are proper instruments.

The null for these tests are: there is no serial correlation, there is serial correlation, the model specified has valid instrumentation and the model specified are proper instruments respectively.

The serial correlation of autoregressive of order 1 with a statistic value of -7.44 with a probability of 0.000 is significant at 1 percent, this implies that the null of no-serial correlation was rejected and accepts the alternative that there is serial correlation. This is in line with the SGMM that the AR1 should be significant and that the successive error terms should be correlated. The AR2 with a statistic of -0.18 with a probability of 0.858 is not significant, thus, the null of serial correlation was rejected and the alternative of no serial correlation was accepted. This is in conformity with the literature that the AR2 should be serial independence.

The Hansen test statistic of 3.07 with a probability of 0.382 is statistically insignificant because the probability value is greater than the 5 percent level, consequently, the study accepted that the variables employed are valid instruments of the estimated model and the null was rejected.

The Sargan test statistic of 1.45with a probability value of 0.657 could also not reject the null that the variables are proper instruments of the estimated model. The post-estimation test result reported above it shows that the estimated model is efficient and therefore, the result of the study is valid for drawing inferences.

From the results in Table 4.2, there is evidence that the lag of infrastructural expectation gap, personal income tax value added tax, and custom and excise duties have a positive relationship with infrastructural expectation gap, while company income tax has a negative relationship with infrastructural expectation gap.

Next is the statistical significance of the parameter estimates, there is evidence that the lag of infrastructural expectation gap, company income tax, and custom and excise duties have significant relationship with infrastructural expectation gap of the selected sub-Saharan African countries (L.IEG = 0.823, Z-test= 2.864, $p < 0.05$; CIT = -0.646, Z-test= -4.869, $p < 0.05$; and CED = 0.126, Z-test = 6.871, $p < 0.05$), individually. This indicates that the lag of infrastructural expectation gap, company income tax, and custom and excise duties were significant factors impelling changes in infrastructural expectation gap in sub-Saharan African countries.

Conversely, there is evidence that the personal income tax and value added tax do not have significant relationship with the infrastructural expectation gap of the selected sub-Saharan African countries (PIT = 0.046, Z-test = 0.084, $p > 0.05$ and VAT = 0.022, Z-test = 0.165, $p > 0.05$,). This implies that personal income tax and value-added tax are not significant factors influencing changes in the infrastructural expectation gap of the selected sub-Saharan African countries.
With reference to the degrees of the estimated parameters 1 percent increase in the lag of infrastructural expectation gap, personal income tax, value added tax, and custom and excise duties will lead to 0.832, 0.046, 0.022, and 0.126 percent increase in infrastructural expectation gap respectively, while 1 percent increase in company income tax will lead to a fall of about 0.646 percent in infrastructural expectation gap.

The Adjusted R^2 measures the proportion of the changes in the infrastructural expectation gap in Sub-Saharan African countries as a result of changes in the previous value of infrastructural expectation gap, company income tax, personal income tax, value added tax, and custom and excise duties explains about 51.2 percent changes in the infrastructural expectation gap of the selected Sub-Saharan African countries, while the remaining 48.8 percent were other factors explaining changes in infrastructural expectation gap of the selected in Sub-Saharan African countries but were not captured in the model.

Decision Rule
With the Wald Chi-Square Statistic of 63.01, the p-value is 0.000 which is less than 0.05 level of significance adopted. The study, therefore, rejected the null hypothesis which means that TAX REVENUE has a significant effect on the infrastructural expectation gap in selected countries of Sub-Saharan Africa.

The result of the study revealed there is evidence that the lack of infrastructural expectation gap, personal income tax value-added tax, and customs and excise duties have a positive relationship with infrastructural expectation gap while companies' income tax has a negative relationship with infrastructural expectation gap. The Wald Chi-Square Statistic rejects the null that tax revenue has no significant effect on the infrastructural expectation gap in selected

countries of sub-Saharan Africa and the alternative hypothesis that tax revenue has a significant effect on the infrastructural expectation gap in selected countries of sub-Saharan Africa was accepted. This evidence conforms with the prior result reported by Olayinka and Phebe (2019) that evaluated the effect of government revenue on infrastructural development in Lagos using the ordinary least square (OLS) regression technique multiple regression. The study found a significant positive relationship between generated revenue and infrastructural development. The result of the study aligns with that of Ajiteru, Adaranijo & Bakare (2018) who conducted a study on tax revenue and infrastructural development in Osun State, Nigeria. The study adopted a survey research design along with a purposive sampling technique, which was used to select 102 respondents for questionnaire administration. The analysis of the data collected was done using linear regression. The study found that tax revenue is positively significant to infrastructural development. Sequel to this, the study concluded that tax revenue is a very strong tool for infrastructural development in the economies of the world.

The findings of this study have demonstrated that tax revenue has a significant effect on stakeholders' infrastructure expectation gap specifically in terms of transportation, energy, water, and telecommunication stakeholders' infrastructure expectation gap dimensions. This implies that tax revenue is a medium through which countries in sub-Saharan Africa can guarantee continuous development of infrastructural facilities in the continent due to improved stakeholder relations and reputational benefits. An effective tax payment goes beyond fulfilling corporations' obligations by covering the interest of all stakeholders. For the adequate provision of infrastructure, management of firms should ensure that tax payment by corporations is duly obliged to and ensure to oversee the strategy of tax payment structure of corporations.

The insignificant nature of some tax revenue measures is not farfetched from the poor institutional framework of tax authorities in the region as indicated by the mean values of companies' income tax (1215.663 million dollars), personal income tax (1800.534 million dollars), value-added tax (64.434 million dollars) and customs and excise duties (1381.060 million dollars). This implies that government agencies, policymakers, and tax regulators should develop standards and guidelines in line with global best practices that will promote tax payment entities and ensure proper monitoring of compliance with the requirements. Also, policies are in place to ensure there is no avenue for the misappropriation of funds and corrupt practices.

The formal analysis of the study shows that tax revenue measures have a greater influence on stakeholders' infrastructure expectation gap. Thus, accounting practices should pay adequate attention to keeping transparent and timely records of the tax payment activities of companies and individuals in the region.
Additionally, accounting practice should help the government in the utilization of tax revenue by setting the structures and engaging assessment tools that are standardized to guarantee accountability and transparency as well as given consideration to needs based on evidence and priority.

5.0. CONCLUSION AND RECOMMENDATIONS

Following the findings of this study, it concluded that tax revenue jointly had a significant effect on the total infrastructural expectation gap in sub-Sahara Africa. On the overall, the study concluded that tax revenue measures such as direct tax (companies' income tax and personal income tax) and indirect tax (custom and excise duties and value-added tax) significantly affect

stakeholders' infrastructure expectation gap indicators in selected sub-Saharan African countries. The study recommended government at all levels should create a platform that will make the filing of tax liabilities easy for firms thereby increasing tax revenue and this will translate into a conducive environment for companies to operate optimally through the provision of infrastructure that will enhance their productivity and subsequently brings about economic growth and development, and that government of sub-Saharan African countries should prioritize stakeholders' interest when making strategic decisions to reduce the infrastructural expectation gap in these countries.

REFERENCES

Abomaye, N., William, A.S., Jack, E. M., & Friday, H. C. (2018). An empirical analysis of tax revenue and economic growth in Nigeria from 1980-2015. Global Journal of Human Social Science Political Science, 18(3), 8-40.

Adegbie, F. F., & Daniel-Adebayo, O. (2017). Taxation and development of capital project in Nigeria. Journal of Taxation and Economic Development, 16(2), 92-115.

Adeosun, K. (2017). Nigeria`s tax to gross domestic product ratio among the lowest in the world. Thisday Newspapers, 5.

Agenor, P. (2006). A Theory of Infrastructure-led Development. Retrieved from: https://www.ses.man.ac.uk/cgbcr/discussi.htm

Ajiteru, W.O., Adaranijo, L.O., & Bakare, L.A. (2018). Tax revenue and infrastructural development in Osun State. International Journal of Innovative Finance and Economic Research, 6(2), 50-61.

Alawi, S.A.H., Wadi, R.A., & Kukreja, G. (2018). The determinants of audit expectation gap: An empirical study from kingdom of Bahrain. Accounting and Finance

Research, 7(3), 54.

Amadi, K. C., & Alolote, I. A. (2020). Government expenditure on infrastructure as a driver for economic growth in Nigeria. Journal of International Business Research and Marketing, 5(2), 20-26.

Amos, O. A., Uniamikogbo, E., & Aigienohuwa, O. O. (2017). Tax revenue and economic growth. Journal of Economics, Business and Management, 4(10), 696-702.

Amin, S. B., & Chen, M.& Huang, P. (2018). An empirical investigation of foreign aid and dudisease in Bangladesh. The Journal of Developing Areas, 52(8), 169-182.

Anyaduba, J. O., & Aronmwan, E. J. (2015). Taxes and infrastructural development in Nigeria. Nigerian Journal of Banking, Finance and Entrepreneurship Management, 1(1), 14-28.

Asaolu, T.O., Olabisi, J., Akinbode, S.O., & Alebiosu, O. N. (2018). Tax revenue and economic growth in Nigeria. Scholedge International Journal of Management and Development, 5(7), 72-85.

Ayeni, O.O., & Afolabi, O. J. (2020). Tax revenue, infrastructural development and economic growth in Nigeria. International Journal of Management and Social Science Research, 7(7), 1-12.

Ayeni, A.P., Ibrahim, J. and Adeyemi, A.O. (2017). Tax Revenue and Nigerian Economic Growth. European Journal of Accounting, Auditing and Finance Research, 5, 75-85.

Ayodele, T. R., Alao, M. A., Ogunjuyigbe, A. S. O., & Munda, J. L. (2019). Electricity generation prospective of hydrogen derived from biogas using food waste in south-western Nigeria. Biomass and Bioenergy, 127, 105291.

Carfora, A., Pansini, R. V., & Pisani, S. (2018). Spatial dynamic modelling of tax gap: The case of Italy. European Spatial Research, 25(1), 12-35.

Chukwuebuka, B. A., & Jisike, J. O. (2020). Infrastructure development and industrial sector productivity in Sub-Saharan Africa. Journal of Economics and Development, 22(1), 91-109.

Donaldson, T., & Dunfee, T.W. (1999). Ties that Bind. Harvard School of Business Press, Boston, M.A.

Donaldson, T. (1983) Constructing a social contract for business. In T. Donaldson & P. Werhane (Eds.), Ethical Issues in Business. New Jersey: Prentice –Hall, Englewood.

Ejemai, M. O., Akintoye, I. R., & Adegbie, F. (2020). Companies' income, customs and excise duty tax gap and infrastructural development in Nigeria, International Journal of Development Research, 10, (30), 34891-34901.

Emmanuel, O. E., & Ibrahim, A. S. (2020). Tax revenue and Nigeria economic growth. European Journal of Social Sciences, 3(2), 23-34.

Eneje, B.C. (2018). Appraisal of companies' income tax and value added tax on growth of Nigeria economy: Imperative for reform. FUNAI Journal of Accounting Business and Finance, 3(1), 187-198.

Falaiye, M., & Okeregbe, A. (2016). Social contract theories and governance contemporary in Nigeria. Procedia Economics and Finance, 7(7), 281- 297.

GHI & Oxford Economics (2018). Global Infrastructure Outlook

Gray, R., Owen, D., & Adams, C. (1996). Accounting and accountability: Changes and challenges in corporate social environmental reporting, Prentice-Hall Europe Harlow.

Hammayo, A., Shittu, I., & Abdullahi, A (2020). Impact of state government revenue on infrastructural development in Bauchi State, Nigeria, International Journal of Accounting and Taxation, 8(1), 34-43.

Ibanichuka, E. L., Akani, F.N., & Ikebujo, O.S. (2016). A time series analysis of effect of tax revenue on economic development of Nigeria. International Journal of Innovative Finance and Economics Research, 4(3), 16-23.

Igga, J. W. (2018). Effects of personal income tax (PIT) on revenue generation in the Republic of South Sudan. International Journal of Economics, Business and Management Research, 2(2), 78-95.

Mbah, A. N., & Onuorah, J.K.J. (2018). Effect of internally generated revenue on infrastructural development of South East States of Nigeria. International Journal of Economics and Business Management, 4(7), 1-10.

Metcalfe, A., & Valeri, C. (2019). Bridging the African infrastructure gap: Bringing accountants to the centre of the decision-making process. ACCA Accounting and Business1(4) 5-15.

Okoror, J. A., Uwaleke, U., Mainoma, M.A., & Oyedokun, G. E**.** (2019). Value added tax and infrastructural development in Nigeria. Journal of Taxation and Economic Development, 18(2), 134-157. A publication of Chartered Institute of Taxation of Nigeria.

Oladipupo, A. O., & Ibadin, P. O. (2015). Indirect taxes and economic growth in Nigeria. EKON. MISAO I PRAKSA DBK. GOD, 2(42), 345-364.

Okwara, O. O., & Chioma, C. (2019a). Revenue generation as a tool for infrastructural development in Nigeria. Journal of Accounting and Financial Management, 5(2), 59-72.

Okwara, C. C., & Amori, O.M. (2017). Impact of tax revenue on economic growth in Nigeria. International Journal of Scientific Research in Social Sciences & Management Studies, 2(2), 90-102.

Olayinka, O. M. & Phebe, I. (2019). Internnally generated revenue and infrastructural development: Of what relevance to Lagos. IOSR Journal of Economics and Finance, 10(4), 58-74.

Oliver, I. I., Edeh, A. C., & Chukwuani, V.N. (2017). Relevance of tax revenue resources to infrastructural development of Nigeria. International Journal of Managerial studies and Research, 5(10), 78-81.

Olunga, H. O., & Solomon, T. (2019). The effects of tax revenue on economic growth in Nigeria (1970-2011). International Journal of Humanities and Social Science Invention, 2(6), 16-26.

Robert, M., Matthew, W., & Mark, Y. (2020). Building the future of infrastructure in Nigeria until 2040. World Social Report, 2020.

Rasulovich, Z. J., & Oripovich, A. Z. (2020). Theoretical aspect of improving the system of taxation. Journal of critical reviews. 7(7), 83-90.

Yahaya, K.A., & Bakare, T.O. (2018). Effect of petroleum profits tax and companies' income tax on economic growth in Nigeria. Journal of Public Administration, Finance and Law, 13(12), 100-121.

Yahaya, K.A., & Yusuf, K. (2019). Impact of non-oil tax revenue on economic growth in Nigeria. Journal of Accounting and Management, 9(2), 56-69.

Zayol, D., Terlumun, A. F., & Johnson, K. T. (2017). The impact of value added tax on the Nigerian economic growth. International Journal of Scientific and Engineering Research, 8(4), 1179-1183.