RESEARCH ARTICLE

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COMPANIES INCOME, CUSTOMS AND EXCISE DUTY TAX GAP AND INFRASTRUCTURAL DEVELOPMENT IN NIGERIA

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ABSTRACT

The Every nation desire to have state of the art infrastructural amenities that will guarantee that its citizens are living a meaningful and comfortable life, such amenities include power supply, education, adequate security of lives and property, good transport system and access to good health care system. The level of infrastructural development present in a country will determine its categorization as a developed or developing country. Tax has been noted to be the most secure form of financing infrastructural development. Existence of tax gap has meant that government can not raise the desired amount to finance capital project. Insufficient information on the estimate of Companies Income Tax gap (CITG) and Customs and Excise Duty tax gap(CEDTG) has necessitated this study. The study adopted *ex post facto* research design. The population of the study was Companies Income Tax and Custom and Excise Duty in Nigeria for the period of 38 years (1981 – 2018). Data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and the Federal Inland Revenue Service Reports (FIRS). Data used were validated by the regulatory agencies and certified as reliable by the office of the Auditor -General of the Federation in line with government regulation. Data were analyzed using descriptive and inferential statistics employing the Auto Regressive Distributed Lag (ARDL) approach. The study found that there is significant positive impact of tax gap of CITG and CEDTG on infrastructural development. It was revealed that CITG and CEDTG have positive significant relation with capital expenditure on economic services, (*Adj. R^2* = 0.69, $F(2, 36)$ = 38.411, ρ<0.05). The study concluded that CITG and CEDTG can lead to a decrease in on capital expenditure over economic services and invariably infrastructural development. The study recommends that government should concentrate on tax revenue heads that significantly affect infrastructural development as this will lead to economic activities that can further grow the country.

INTRODUCTION

Every nation desire to have state of the art infrastructural amenities that will guarantee that its citizens are living a meaningful and comfortable life, such amenities include power supply, education, adequate security of lives and property, good transport system and access to good health care system. Thus, the level of infrastructural development present in a country will determine its categorization as a developed or developing country. Inability to generate adequate funds can affect the level of infrastructural amenities provided by the government of a State (Adeosun, 2017). Thus, government of countries continue to strive to provide basic infrastructure regardless of lack of adequate funds. Adegbie and Daniel-Adebayo, (2017); Akintoye, Onakoya, Amos and Olayinka, (2015); Raczkowski, (2015) opined that infrastructural development of any country is dependent on the tax revenue

generated and a deficit in infrastructure can result to a country being perpetually referred to as developing. Chauvet and Ferry (2016) noted that governments of today will continuously have to mobilize revenue to provide and upgrade existing infrastructure if they want to remain relevant in the future. Many Developing countries in Africa have struggled with infrastructural challenges for decades. Metcalfe and Valeri (2019), estimated Africa`s infrastructural gap and defined the gap as the difference between the investment needed to improve and provide infrastructure and the resources available to meet it. The gap is estimated to be US$ 1.59 trillion by 2040. The challenges faced by most African Countries are the lack of vision, political stability and revenue to not only build new projects but maintain existing ones. In bridging this gap, Metcalfe and Valeri (2019) noted that government will have to increase borrowing or taxation. They however posited that increasing the tax net can provide the much-needed revenue

for infrastructural development in Africa. Nigeria is currently experiencing extreme infrastructural deficit and has been ranked 132 out of 138 countries with the least infrastructure (WEF) and unfortunately, the current trajectory places Nigeria as 136 out of 138 by 2040 as the country with the least access to basic amenities and ease of doing business. Through the years, Nigeria has struggled to enact policies and laws to improve the infrastructural terrain of the country. Some of them are; the First National Development Plan 1962-1968, which focused on discouraging importation and exploring national economic resources at a cost-benefit basis. Kanji Dam and Ughelli Thermal Plants were the products of this era as well the starting of First Bank of Nigeria and Oil Refinery.1970-1974 witnessed the Second National Development Plan that focused on industrializing the economy from the new-found proceeds of oil. However, lack of technology and political will as well as military coup meant that areas such as agriculture, transport, mining and quarry suffered and the country did not record much improvement during this era (Chete, Adeoti, Adeyinka & Ogundele, 2014).

1975-1980 was the Third National Development Plan. This was launched at the height of the Oil Boom and the plan estimated 42B Naira on industrial development and public sector and this propelled Nigeria into industrialization. The Fourth National Development plan (1981-1985) saw the first global economic meltdown, Nigeria experienced huge decline in foreign exchange earnings as the economy was heavily dependent on income from oil and oil related activities. This led to high unemployment and balance of trade disequilibrium. Industries that relied on imported raw materials were greatly hit. Oil revenue continued to dwindle and the country faced huge economic challenges (Adeoti, 2010). The Structural Adjustment Programme (SAP) of 1986 was to address the over-dependence on oil revenue and stimulate local industries and private-based investment. Also, in 1986, A National Science and Technology Policy was formulated to encourage Science and Technology development in Nigeria. In1989, A Trade and Financial Liberation policy was enacted to encourage domestic production and stimulate indigenous industries. In the same year, National Economic Reconstruction Fund (NERFUND) was established to help attract foreign investors to local industries. While this worked for a while it eventually led to the flooding of the economy with foreign goods that were cheaper than the local ones which further killed the local industries. By the end of the 1990`s, the damage to the economy was already greatly felt and this led to the revising of the Science and Technology policy to boost local industries and participation. National Economic Empowerment Development Strategy (NEEDS) was enacted in 2007 to focus on upgrading the deficient infrastructure that was needed to grow the economy, likewise was the Nigeria Vision 20:2020. Bank of Industry was established in 2000 to serve as a catalyst to development (Chete, Adeoti, Adeyinka &Ogundele, 2014). The current Economy Recovery and Growth Plan (ERGP) is also tailored to address the deplorable state of the country`s infrastructure while at the same time stimulating economic growth and development (World Bank, 2012).

The essence of taxation is to provide government with funds to provide basic amenities, infrastructure as well as close the gap or redistribute income among various existing social classes in a country (Asaolu, Olabisi, Akinbode & Alebiosu, (2018). However, there seems to be a gap between the expected funds to be generated through tax collection and the actual amount collected. In the same vein, there exists a lacuna between the level of infrastructure the government is meant to provide and the infrastructure provided. Tax Gap is the difference between the potential revenue to be collected legally and the actual revenue collected (Khwaja & Iyer, 2014). In the global economy, taxes are one of the most secured forms of financing infrastructural deficit or gap (Gasper & Wingender, 2016). Adequate tax income makes it possible for government to finance and implement domestic policies of economic and infrastructural development without having to borrow (Brownlee, Ide & Fukagai, 2013). Thus, ensuring proper and adequate collections as well as measurement is very important to developed, developing and under-developed countries. In the early 20th century, discussions around the estimation of tax gap and its effect on existing infrastructure in countries came into prominence because of the fact that economic development and growth failed to meet early expectations and projections. A link was established between the low level of taxes collected versus the expected level of infrastructure in a country (Raczkowski & Bogdan, 2018; Danquah & Osei-Assibey, 2016).

Usman (2018), estimated the Personal Income Tax gap in Kaduna to be 13.85% which amounted to 9.68% of the potential tax to be collected. However, the study did not provide an estimate of tax gap for Companies Income Tax and indirect taxes in Nigeria. Warren (2018) opined that the importance of tax gap measurement cannot be under estimated as administrators can only close existing space if they know what constitutes the gap and how the space is a gap. The study applied theoretical frame work of MIMC, which was adopted in this study to estimate the tax gap in Nigeria vis-a vis Companies Income Tax, and Custom and Excise Duty. It is thus of utmost importance that Nigeria, as a country, estimated her tax gap in other to determine areas where funds can be realized instead of borrowing from foreign creditors. Several countries, Developed and otherwise have extensive information on tax gap and the effect on infrastructural development. However, this information is insufficient in Nigeria. The huge infrastructural deficit in Nigeria cannot be over looked and several studies have noted that tax gap has contributed to the deficit. This has necessitated this study. This study will strive to estimate the Nigeria tax gap relating to Companies Income Tax and Customs and Excise Tax and the effect of this on infrastructural development using the MIMC model.

A Review of Extant Literature

Conceptual Review

Infrastructural Development: Infrastructure are physical systems that undergird the structure of nations and ensure it meet its needs for growth and development. They are usually basic and expected to be available. They include transport system, communication network, clean water supply, proper waste management and adequate power supply. Infrastructure require a huge financial commitment, startup cost and continuous maintenance which may also be costly (Babatunde, 2018). Government is fundamentally responsible for provision of infrastructure. This is traditionally funded from tax revenue. Infrastructural development is closely linked to growth in economic activities that cut across a wide geographically location such as a metro train that runs across a country or a

gas pipe line that supplies millions of households. Due to the magnitude of this nature; public financing, supervision and regulation is usually required to meet these needs. Consequently, economic activities will grow and natural monopolies will be established. Infrastructure can be soft, hard or critical. Soft infrastructure refers to the institutions that make up the system such as regulatory authorities and government systems. Soft infrastructure is the bed rock of the hard infrastructure. Government. Administrative functions, national research and development activities are also categorized as soft infrastructure. Hard infrastructure are the physical, tangible structure or systems. They are the actual infrastructure that builds the economy such as roads, hospitals and telecommunication apparatus (Asaolu *et al.*, 2018).

Government Capital Expenditure on Economic Services (LGCEES): Babatunde (2018) defined Government Capital Expenditure on Economic Services as expenditure on education, transportation, communication, health infrastructure, agriculture as well as investment in natural resources. This refers to the real infrastructure within the country such as roads, communication network, rail tracks, National airline fleet, refineries hospital buildings and all agro-related industries (Asaolu *et al.,* 2018; Akintoye *et al.,* 2015; Edame & Fonta, 2014). Economic services are capital expenditure incurred by government in order to facilitate economic activities within the country and create opportunities for growth, Economic services have the ripple effect of increasing money within the economy as well as providing employment opportunities (Adegbie & Daniel-Adebayo, 2017). A close and deep look at the different definitions highlighted above shows that economic services relate to expenditure on tangible and physical assets by government. These are assets that can be seen and felt and used by all citizens regardless of location. While Adegibe and Daniel-Adebayo (2017) explained the meaning of economic services, Babatunde (2018) highlighted the different examples of expenditure on economic activities in explaining the meaning.

Tax Gap: Tax gap is the variance between the actual or expected tax liability in any tax or year and the amount of voluntary tax paid. The intended tax to be paid by tax payers can differ from the statutorily calculated or computed tax to be paid. The difference makes up the tax gap. In recent times, however, developed countries have computed tax gap using MIMC macro approach, this method makes use of macro-economic indicators to determine Tax gap and provides more precision to results arrived at (Schneider, Raczkowski & Mróz 2015). Countries in the Far East such as Nepal, India, Bangladesh Pakistan and Sri Lanka like other advanced countries, have invested in estimating their tax gap. This is to allow them compare their position to their advanced counterparts as well as take corrective means to improve government revenue collected through tax methods. Tax gap estimation is a global issue that is rapidly gaining advancement across countries of the world. Some countries in Africa such as Kenya, Zambia, and Zimbabwe have attempted to compute their tax gap by focusing on tax evasion and avoidance. Although they use less sophisticated methods than their developed counterparts, the end result or objective remains the same, reducing tax loss during collection in order to provide better social amenities for their population and country. South Africa in 2018 carried out a research to determine the reasons for low tax collection by surveying tax payers, consultants and administrators. Ultimately, tax gap was noted as a result of

complex tax laws and poor education and enlightenment of tax payers (Bouet & Roy, 2014). While in Zambia, the constitution places greater reliance on auditors and accountants to report incidences of tax avoidance. It is increasingly clear that the professionals put their self-interest before that of the country as tax gap continues to increase (Nalishebo & Aliwampa, 2014). Like its other African counter parts, Nigeria struggles to accurately estimate its tax gap, mainly as a result of inadequate data and lack of will to determine actual tax lost. With a reported GDP to tax ratio of 6%, tax collected in Nigeria remains part of the least in the world. A huge underground economy, high tax evasion and avoidance tactics as well as wide spread corruption have led to a wide tax gap as well as decades of deficits in infrastructural development in the country (Ariyo & Bekoe, 2014).

Companies Income Tax (CIT): CIT refers to taxes paid by registered companies, its usually computed on a flat rate on profit of registered entities. CIT are imposed on incomes and other activities of registered corporate entities (Collier & Venables 2016; Adegbite, 2015). Proceeds from CIT contributes significantly to government revenue and thus help achieve macro-economic objectives relating to fiscal and monetary policies (Gale & Samwick 2014; Adegbie & Fakile; 2011). However, Usman (2018) noted that CIT as well as other taxes in Nigeria are not at their optimal level as many companies under report revenue and make use of tax loopholes to pay the minimum amount of taxes. These activities contribute to the low GDP to Tax ratio experienced in Nigeria.

Customs and Excise Duty: Customs and Excise Duty are taxes collected on imported and exported items. This form of tax can be used to encourage or discourage a line of activity within a country (Asaolu *et al.*, 2018). They are levied by customs authorities of a country to raise revenue for the state and to protect domestic and indigenous companies from more advanced and sophisticated foreign counterparts. Custom duty is based on the value of the goods in terms of weight, proportion and other criteria as stated by the constitution. Custom duty is the oldest form of modern taxes and can also be referred to as import duties. Export duties are however charged on goods leaving the country for foreign lands. Often times, the practice is to have export duties that are cheaper than import duties in order to encourage local industries. Ibadin and Oladipupo (2015) and Fasoranti (2013) stated that custom duties are usually in form of percentages of the import value or a fixed portion of a certain quantity or weight. Excise duty, on the order hand, is levied on goods produced within a country but meant for export to another country. Government thus uses the excise duty to encourage the export of locally produced products or to stimulate the fiscal economy of a country. It is expected that excise duties will be relatively lower than custom duty because of the objective of the tax revenue head (Babatunde, 2018).

Theoretical Consideration

Multiple Indicators Multiple Causes Theory: This paper is based on the Multiple Indicators Multiple Causes Theory that was propounded by Frey and Weck Hanneman in 1984. This theory of estimating the tax gap utilizes two variables: observed band indicator. The observed variable helps to identify the causal factors of the shadow economy such as level of government spending (taxation), provision of infrastructure, GDP per capita, government consumption, cost of security

provided, level of unemployment and corruption index. Indicator (latent) variable however identifies the shadow economy which can contribute to the Tax gap. factors such as cash circulating in the economy, level of growth per GDP, number of employment outside official system are measured to estimate the latent variable(Nchor & Adamec, 2015). The major assumption of this theory is that there exists a latent relationship between the indicator and the observed variables. The Structural Equation Modelling is used to compute the observed variables.

Empirical Literature Review: Asaolu, Olabisi, Akinbode and Alebiosu (2018) examined the relationship between tax revenue and economic growth in Nigeria from1994 to 2015 using secondary data from The Central Bank of Nigeria. The study noted that taxation is the bedrock of any modern society and recommended that adequate use of tax revenue can grow the economy, while estimating tax gap can lead to tax evasion and avoidance that causes holes in the revenue generated. The study revealed that CIT had a negative relationship with economic growth while Customs and Excise Duty showed a positive effect. Adegbie and Daniel–Adebayo (2017) disagreed that CIT has a negative significance to the Nigerian economy in terms of growth and revenue. The study highlighted the need to retain CIT and possibly reduce it in order to simulate further economic activities that will close the tax gap and reduce the underground economy. Adegbie and Fakile (2011), explored the relationship between Companies' Income Tax and economic development in Nigeria and revealed that there is a significant relationship among Companies' Income Tax and Nigeria economic development. Yousuf and Jakaria (2013) provided empirical evidence that CIT had a significant relation to revenue generation and development and that tax revenue from Companies Income Tax was closely related to revenue from CED for the period between 1980 and 2011 in Bangladesh. The study concluded that an increase in CIT can be used as prediction model for expected revenue in other taxes.

Asaolu et al (2018) examined the existing relationship between tax revenue heads and economic growth in Nigeria. The study covered 1994 to 2015 and secondary data was derived from Central Bank Bulletin and Annual Reports of Companies. The result revealed that Custom and Excise Duty had a significant relationship with economic growth while Companies Income Tax showed a negative significant relationship. Ibadin and Oladipipo (2016), using the same parameters agreed that Custom and Excise Duty had a positive and significant effect on Nigerian economic development between 1981- 2014. Inyiama and Ubesie (2016); Joseph, Ikechukwu and Amah (2016) focused their studies on custom duties and its contribution to tax revenue on the Nigerian Economy along with other indirect taxes. The results empirically revealed that Custom and Excise Duty and Value Added Tax have significant effect on the total tax collected in Nigeria for the period ranging from 1994 to 2014. Akintoye et al, (2015), reported that lack of adequate power in Nigeria negatively affected the economic growth of the country. The study noted that over all, decay in capital expenditure on economic activities had the greatest negative effect on development and huge investment was needed on capital expenditure on economic services. The outcome of the works of Darma (2014) and Fasoranti (2016) provides support for the position of Akintoye et al, (2015). Darma (2014) in his study on the effect of capital expenditure on economic growth in Nigeria from

1980 to 2010 noted that capital expenditure on administration, social and communities' services and transfers had a positive impact on the economic growth of Nigeria. This means that an increase in any of the above will lead to an increase in economic growth. The study noted that poor utilization and misuse of funds contributed to the decay in infrastructure in the country. The study recommended that government should ensure corrupt leaders are dealt with in order to discourage corruption, which is a major challenge in Nigeria. Maintaining a stable exchange rate has remained a major challenge for governments of countries and policies to manage exchange rate can lead to accumulation of foreign exchange. A study conducted by Anyanwu, Ananwude, and Okoye (2017) revealed that the real economy was significantly affected by the level of exchange rate. Nse and Anietie (2018) noted that inflation was as wide as 9.2% and 18.3% in 2016 and 2017.The effect of such high figure is that standard of living of citizens will reduce as their purchasing power reduces. Economic growth and activities will be discouraged and the stability of prices will not be possible.

MATERIALS AND METHODS

Methodology: The research design adopted for this work was ex-post facto. Prior studies such as Usman (2018), Danquah and Assibey (2016) and Raczkowski (2015). This study considered the effect of Companies Income Tax and Custom and Excise duty on infrastructural development in Nigeria covering the period of thirty-eight (38) years from 1981 to 2018 for all the variables, Nigeria represents the target population of the study. Companies Income Tax and Custom and Excise duty revenue heads are administered by the Federal Government and thus data was easily assessed and verified. The proxy for infrastructural development was economic services and this represented the dependent variables, while the independent variables is Companies Income Tax and Custom and Excise duty. The tax gap was computed from the underground economy and the variables that were used for the underground economy were the real balances of the money supply, interest rates and value added tax. The data from the Federal Inland Revenue Service (FIRS) and the Central Bank of Nigeria (CBN) Statistical Bulletin was examined and confirmed valid and reliable by the office of the Auditor - General of the Federation. The nature of data used in this study to achieve the stated objectives was time series in nature. Thus, the study was subjected to three categories of test. First, descriptive statistics and the purpose was to know the descriptive characteristics of the data. Therefore, statistics such as the mean, maximum, minimum values, standard deviation and the Jarque-Bera test were computed to know the behaviour of the variables. In addition, unit root tests were performed to examine the time series properties of the variables of study. To achieve this, the Augmented Dickey-Fuller (ADF) and the Phillip-Peron (PP) will be used.

Second, the Auto Regressive Distributed Lag (ARDL) approach advanced by Pesaran and Pesaran (2001) was used to examine the long-run and short run co- integrating dynamics of tax gap on infrastructural development in Nigeria. Third, is the diagnostic tests; the purpose of these tests was to examine if the estimated models were not spurious. To this end, five diagnostic tests were conducted and they are; i. Serial Correlation LM Test to determine if the successive error terms are correlated; ii. Breusch-Pagan/Harvey test for homoscedasticity residuals; iii.

Ramsey Regression Equation Specification Test (RESET) used to examine the existence of linear relationship between the dependent and independent variables; iv. The Jarque-Bera test to examine the relation between the weakness and flatness as well as the degree of asymmetry of the variables; v. The cumulative sum of residuals (CUSUM) and the cumulative of squared residuals were also used to examine the stability of the model. E-View version 10 was used to facilitate the estimation process.

Model Specification

Tax Gap Computation: In determining the tax gap on Companies' Income Tax and Customs and Excise Duty, the computation of the underground or the shadow economy is required. This study therefore follows the Multiple Indicators and Multiple Causes (MIMC) approach advanced by Frey and Hanneman (1984). The regression equation for the underground economy is given as;

$$LRMBAL_t = \beta_0 + \beta_1 LRMBAL_{t-1} + \beta_2 LCITGDP_t + \beta_3 LRATES_t + \beta_4 LCPI_t \quad (3.1)$$

$$LRMBAL_t = \beta_0 + \beta_1 LRMBAL_{t-1} + \beta_2 LCEDGDP_t + \beta_3 LRATES_t + \beta_4 LCPI_t \quad (3.2)$$

Where:

LRMBAL = Natural logarithm of the real money balances which is defined as broad money supply deflated by the Consumer Price Index.
LRMBAL(-1) = Natural logarithm of the previous value of the real money balances
LCITGDP = Natural logarithm of the Companies Income Tax expressed as a percentage of the Gross Domestic Product for modeling the effect of tax burden on liquidity demand
LCEDGDP = Natural logarithm of the Custom and Excise Duties expressed as a percentage of the Gross Domestic Product for modeling the effect of tax burden on liquidity demand
LRATES = Natural logarithm of one year bank deposit rates to account for the opportunity cost of cash demand.
LPCI = Natural logarithm of the per capita income to account for the effect of precautionary and transaction demand of money

$$CITG = UE.CITR \quad (3.5)$$
$$CEDG = UE.CEDR \quad (3.6)$$

Where

UE = Underground Economy
CITG = Companies Income Tax Gap
CITR = Companies Income Tax Rate
CEDG = Custom and Excise Duty Tax Gap
CEDR = Custom and Excise Tax Rate

Functional Equations

The functional equations for the five specific objectives examining the relationship between tax gap and infrastructural development are stated below:

Y = f(X)

Y = dependent variable = Infrastructural development (INFDEV)
X = independent variable = Tax gap (TG)
Y = y_1 (measures of dependent variable)
X = x_1, x_2 (measures of independent variable)
Where:
y_1 = Government Capital Expenditure on Economic Services (LGCEES)
x_1 = Companies Income Tax Gap (LCITG)
x_2 = Custom and Excise Duty Tax Gap (LCEDTG)

Functional Relationships

INFDEV = f (TG)
LGCEES = f(LCITG, LCEDTG)   ----------------Equation$_1$

Where:

Equation1 are relationships that measure the effect of tax gap on infrastructural development.

The Models

The model equations for the functional relationship are specified below:

$$LGCEES_t = \alpha_0 + \alpha_1 LCITG_t + \alpha_2 LCEDTG + \varepsilon_t \dots \text{Model 1}$$

Table 1a. Descriptive Statistics

Variables	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob	Obs
LINFDEV	2.16	2.46	3.23	0.61	0.86	-0.60	1.85	4.15	0.13	38
LGCEA	1.41	1.69	2.65	0.58	1.03	-0.57	1.97	3.54	0.17	38
LCITG	0.44	0.30	29.86	9.23	1.00	-0.81	4.59	3.70	0.15	38
LCEDTG	0.19	2.08	11.97	2.98	7.78	-0.69	2.99	2.89	0.24	38

Source: Researcher's Computation, (2020)

After the computation of equations 3.1 to 3.4, the underground economy is computed as;

$$UE = LRMBAL_t - \{\beta_0 + \beta_1 LRMBAL_{t-1} + \beta_2 LCITGDP_t + \beta_3 LRATES_t + \beta_4 LCPI_t\} \quad (3.3)$$

$$UE = LRMBAL_t - \{\beta_0 + \beta_1 LRMBAL_{t-1} + \beta_2 LCEDGDP_t + \beta_3 LRATES_t + \beta_4 LCPI_t\} \quad (3.4)$$

It should be noted that equation 3.3- 3.4 is the underground economy for Companies Income Tax and Custom and Excise Duties From equations 3.5 - 3.6, the tax gap is computed as;

Where:

α_{0s} are the intercepts; α_{1s} are the coefficients of the explanatory variables; t represents the time series observation; ε_t are the error or disturbance terms.

Data Analysis, Result and Discussion of Findings

Descriptive Statistics: In this section, the dependent variable infrastructure development is proxy with the Natural Logarithm of Government Capital Expenditure on Economic Services (LGCEES). The independent variable is tax gap on Companies Income Tax (LCITG) and Custom and Excise

Table 2. Tax Gap in Nigeria from 1981-2018 in billions of naira

Year	LCITG	LCEDTG
1981	1.88	2.14
1982	13.79	3.61
1983	1.79	4.01
1984	4.86	10.43
1985	9.49	9.79
1986	59.23	1.84
1987	3.75	2.55
1988	11.52	5.74
1989	24.10	6.46
1990	0.16	2.33
1991	31.57	5.63
1992	1.90	0.90
1993	9.79	9.22
1994	1.46	7.36
1995	1.33	2.62
1996	26.51	6.76
1997	1.46	15.04
1998	7.46	9.10
1999	0.38	3.56
2000	44.28	20.98
2001	3.17	13.35
2002	15.96	6.78
2003	2.01	7.79
2004	28.59	5.22
2005	19.86	7.33
2006	14.70	3.29
2007	0.81	1.39
2008	0.21	7.60
2009	14.73	11.97
2010	11.94	5.67
2011	5.40	1.06
2012	1.51	3.34
2013	6.20	4.19
2014	9.81	4.61
2015	12.62	6.49
2016	29.18	5.63
2017	20.32	8.66
2018	29.86	6.67

Source: Researcher's Computation, (2020)
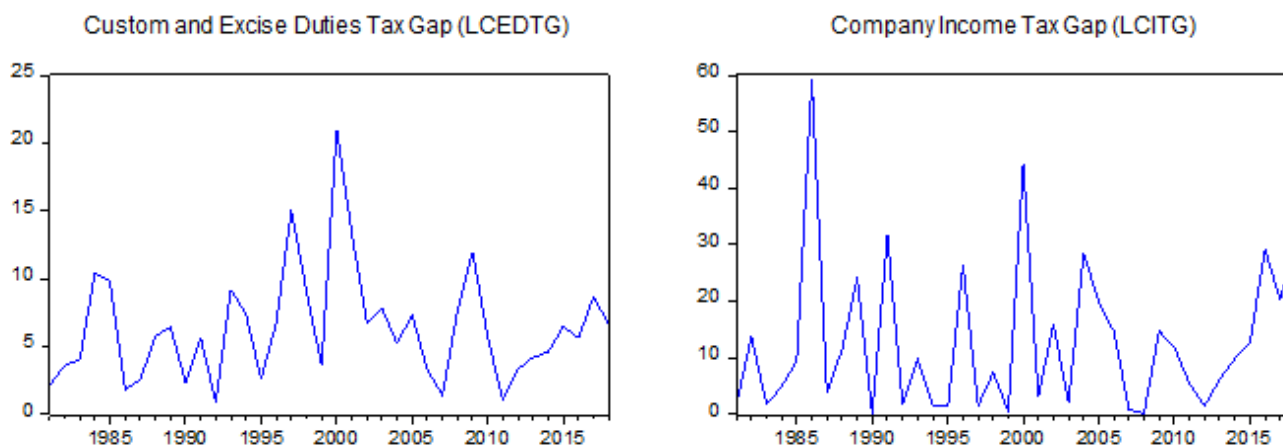
Source: Researcher's Computation, (2020)

Figure 1. Tax Revenue Gap in Nigeria from 1981-2018

Duties (LCEDTG). Annual data for thirty-eight years were used and it is from 1981-2018 for Nigeria.

Notes: Table 4.1a shows the mean, median, maximum, minimum, standard deviation, skewness, kurtosis and Jarque-Bera test for normality of the variables.

The dependent variable is the Natural Logarithm of Infrastructural Development (LINFDEV), Government Capital Expenditure on Economic Services (LGCEES). The independent variables are the logarithms of Companies Income Tax Gap (LCITG), the Custom and Excise Duties gap

(LCEDTG) for the period 1981-2018 in Nigeria. The estimation process was facilitated using Eviews 10.

Interpretation: The mean value of infrastructural development, Government Capital Expenditure on Economic Services, Companies Income Tax gap and Custom and Excise Duties tax gap is 2.16 with a median of 2.46,1.72 with a median of 2.23,0.44 with a median of 0.30 and is 0.19 with a median of 2.08 respectively. It also shows that infrastructural development follows normal distribution because the Jarque-Bera test shows that the variable are normally distributed with a chi-square statistic of 4.15,4.75, 3.70 and 2.89 respectively.

Descriptive for Tax Revenue Gap for Nigeria 1981-2018:
The Companies Income Tax gap was at its lowest point in 1990 with about N0.16 billion, while N59.23 billion were recorded in 1986. The pattern of the Companies Income Tax has been fluctuating over the years, it later fell drastically to N0.16 billion in 1990 before rising to N31.57B in 1991. It later rose to N44.28billion in 2000 and fell thereafter. The magnitude of the Custom and Excise Duties tax gap in Nigeria has an average value of N6.34 billion and the highest value is N20.98 billion.

Note: Table 4.1b presents the computed tax revenue gap based on the Multiple Indicators and Multiple Causes (MIMC) approach advanced by Frey and Hanneman (1984) for Companies' Income Tax (LCITG), Custom and Excise Duties (LCEDTG), Value Added Tax (LVATG) and Stamp Duties (LSDTG). Table 4.1 shows the CIT and CED tax gap for 38 years starting from 1981 to 2018, while Figure 4.1b depicts graphically the CIT and CED gap for the same period.

Table 2. Full Information on the Effects of Tax Gap on Government Capital Expenditure on Economic Services

Panel A: Long Run Estimates				
Dependent Variable: LGCEES				
Variable	Coefficient	S.E	t-stat	Prob
LCITG	0.1893	0.0744	2.5464	0.0476
LCEDTG	0.3389	0.0987	3.4342	0.0009
C	2.7209	0.4497	6.0508	0.0000
Panel B: Short -Run Estimates				
Variable	Coefficient	S.E	t-stat	Prob
D(LGCEES(-1))	-0.1327	0.1998	-0.6643	0.5141
D(LCITG)	0.0044	0.0026	1.7059	0.1035
D(LCITG(-1))	0.0055	0.0032	1.6811	0.1083
D(LCITG(-2))	-0.0054	0.0028	-1.9127	0.0702
D(LCITG(-3))	0.0027	0.0022	1.2232	0.2355
D(LCEDTG)	0.0097	0.0077	1.2654	0.2203
D(LCEDTG(-1))	0.0068	0.0075	0.9032	0.3772
D(LCEDTG(-2))	-0.0030	0.0080	-0.3714	0.7143
D(LCEDTG(-3))	0.0012	0.0086	0.1387	0.8911
ECM(-1)	-0.1357	0.0402	-3.3789	0.0030
Panel C: Diagnostic Tests		Statistic	Prob.	
Bound Test		6.482	0.000	
Serial Correlation		0.017	0.983	
Heteroscedasticity		0.795	0.651	
Normality Test		0.217	0.897	
Linearity Test		0.832	0.165	
Adjusted R-square		0.687		
		CUSUM	CUSUMSQ	
Stability Test		Stable	Stable	
F-Statistics		38.411	0.000	

Source: Researcher's Computation, (2020)

Notes: Table 4.2 reports the long-run estimates, short run estimates and the diagnostic tests for the relationship between tax gap and Government Capital Expenditure on Economic Services. The dependent variable is the logarithm of Government Capital Expenditure on Economic Services (LGCEES) while the independent variables are the tax gap on Companies Income Tax (LCITG) and Custom and Excise Duties (LCEDTG). The critical values for the bound test are 4.26, 3.50 and 3.13 at 1, 5 and 10 per cent respectively.

Interpretation

$$LGCEES_t = \beta_1 + \beta_2 LCITG_t + \beta_3 LCEDTG_t + \varepsilon_t$$
$$LGCEES_t = 2.721 + 0.189 LCITG_t + 0.339 LCEDTG_t + \varepsilon_t$$

From Panel C of Table 4.2, the bound test statistics value is 6.482 and it is greater than the critical values bound at upper bound (I1) of 4.26, 3.5 and 3.13 at 1 percent. This implies that the variables co-moved in the long run. Having found a long-

run relationship between tax gap and government capital expenditure on economic services, the study then estimated The long-run and the short-run elasticity. The empirical results for the model, obtained through normalizing tax gap and government capital expenditure on economic services, in the short and long run are reported in Table 4.2.

The Long-Run Dynamics: The estimated long-run coefficients (elasticities) for the UECM model are given in the tables Panel A of Tables 4.2. In the long run, there is evidence that Companies Income Tax gap and Custom and Excise Duties tax gap have positive relationship with government capital expenditure on economic services. This implies that increases in Companies Income Tax gap realized and Custom and Excise Duties tax gap realized will lead to increase in the Government Capital Expenditure on Economic Services in Nigeria. Furthermore, there is evidence of a long-run significant relationship among Companies Income Tax gap and Custom and Excise Duties tax gap with Government Capital Expenditure on Economic Services in Nigeria (LCITG = 0.189, t-test= 2.546, $\rho<0.05$ and LCEDTG = 0.338, t-test= 3.434, $\rho<0.05$). This implies that Companies Income Tax gap and Custom and Excise Duties tax gap are significant factors influencing changes within Government Capital Expenditure on Economic Services in Nigeria. Also, a 1 per cent increase in Companies Income Tax gap and Custom and Excise Duties tax gap will lead to 0.189 and 0.338 per cent increase in Government Capital Expenditure on Economic Services in Nigeria respectively in the long run. The F-statistics value of 38.411 is statistically significant at 1 per cent. Thus, the null hypotheses that there is no significant effect of tax gap on Government Capital Expenditure on Economic Services in Nigeria was rejected and the alternative hypothesis that there is significant effect of tax gap on Government Capital Expenditure on Economic Services in Nigeria was accepted.

Short-run Dynamics: The purpose of this section is for two reasons. First, is to examine if changes and the statistical significance experienced in the long run also exist in the short run model. Second, is to examine the degree of adjustment back to equilibrium using the error correction term. The short-run adjustment process is measured by the error correction term ECM_{t-1} and it shows how quickly variables adjust to a shock and return to equilibrium. For stability, the coefficient of ECM_{t-1} should carry the negative sign and be statistically significant. The result shows that in the short-run both the Companies Income Tax gap and Custom and Excise Duties tax gap do not have significant relationship with government capital expenditure on economic services. In addition, the estimated coefficient for the ECM_{t-1} reported in Panel B of Table 4.7 is negative and statistically significant (ECM= -0.136, t-test = -3.379, p<0.05). This implies that deviations from Government Capital Expenditure on Economic Services equilibrium path are corrected by nearly 14 per cent over the following year. In other words, the adjustment process is relatively slow in Nigeria. The statistical significance of the ECM_{t-1} confirms the presence of long-run equilibrium relationship between tax gap and Government Capital Expenditure on Economic Services in Nigeria. The Adjusted R-square is 0.69. This implies that Companies Income Tax gap and Custom and Excise Duties tax gap explain about 69 per cent changes in government capital expenditure on economic services, while the remaining 31 per cent were other factors affecting changes in Government Capital Expenditure on Economic Services but were not captured in the model.
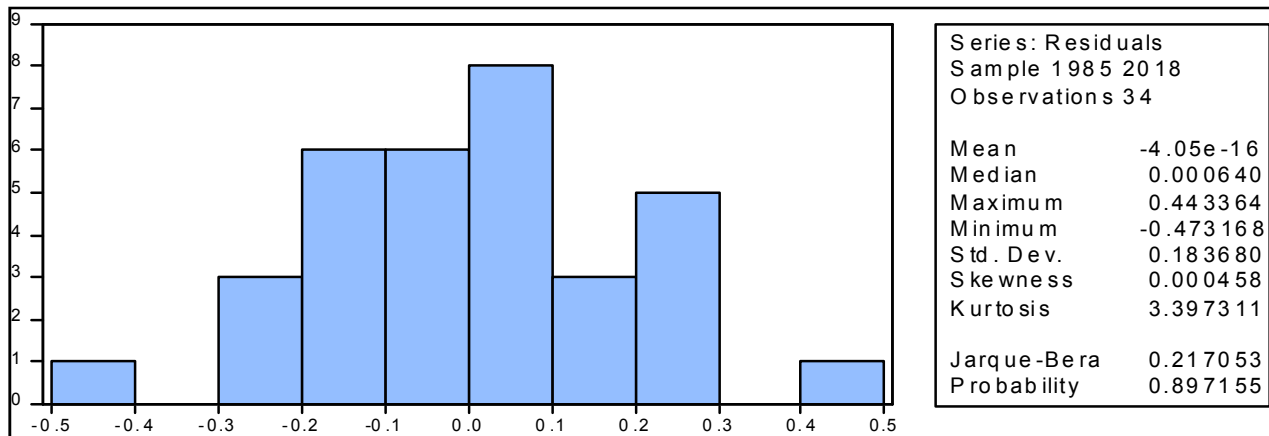
Series: Residuals	
Sample 1985 2018	
Observations 34	
Mean	-4.05e-16
Median	0.000640
Maximum	0.443364
Minimum	-0.473168
Std. Dev.	0.183680
Skewness	0.000458
Kurtosis	3.397311
Jarque-Bera	0.217053
Probability	0.897155

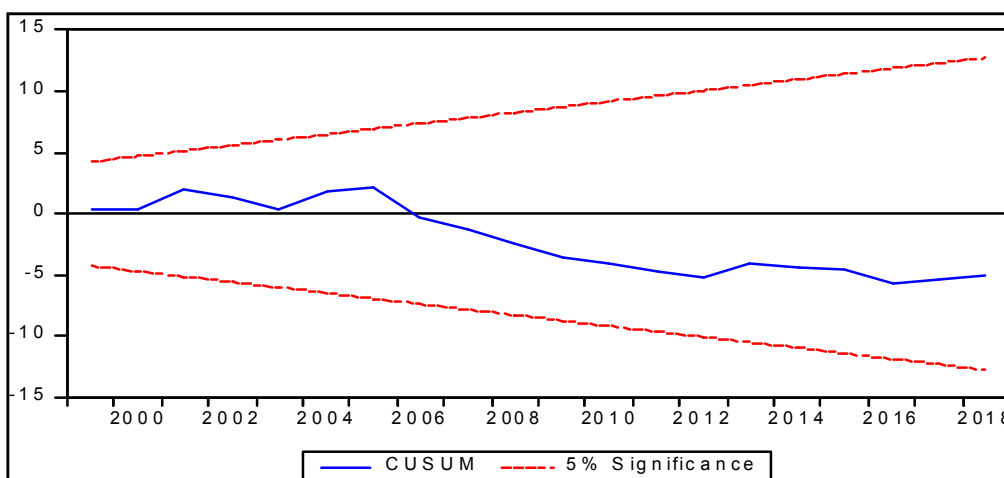**Figure 2. Normality Test –Jarque Bera Statistic**

Figure 3. Stability Test - Plots of Cumulative Sum of Residual
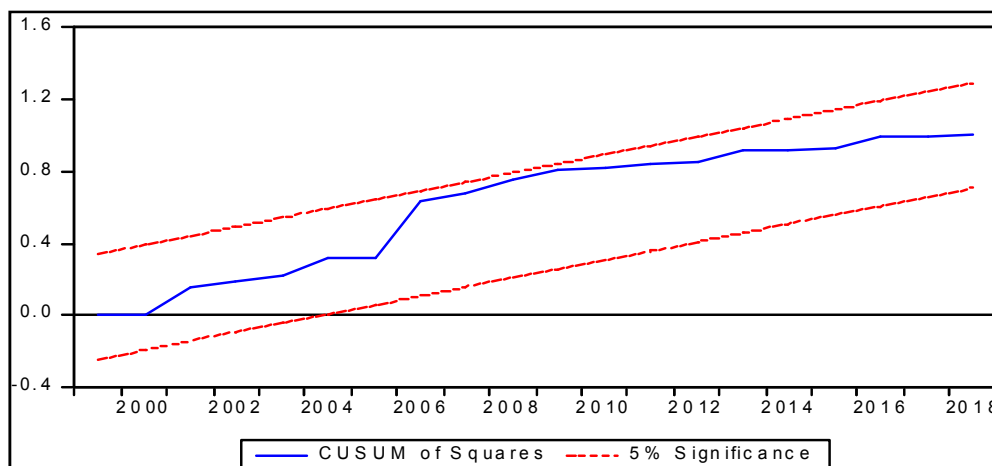

Figure 4. Stability Test - Plots of Cumulative Sum of Square Residual

Diagnostic Test: The linearity assumption of ARDL test was estimated using Ramsey Reset Test, F-statistics of 0.832 and its ρ-value of 17 per cent is greater than 5 per cent chosen level of significance, thus the null hypothesis of linearity cannot be rejected. This implies that the model is correctly specified and that there is a linear relationship between tax gap and Government Capital Expenditure on Economic Services in Nigeria. The Heteroskedasticity Test the result suggests that a statistic of 0.795 is not statistically significant at 5 per cent level of significance, this implies that the null hypothesis of homoscedasticity could not be rejected.

Thus, there is evidence that the covariance of the error terms has a constant finite variance. The Breusch-Godfrey Serial Correlation LM Test, the probability value of F-statistic of 0.017 is in favour of the null hypothesis that there is no serial correlation in the residuals up to the specified lag order at 5 percent significant level. Thus, the study concluded that the successive error terms were not correlated in the estimated model for tax gap and Government Capital Expenditure on Economic Services in Nigeria. The CUSUM and the CUSUMSQ test also shows that the estimated model is stable;

this is because the plot of CUSUM and CUSUMSQ statistic stays within a 5% significance level portrayed by two straight lines.

DISCUSSION OF FINDINGS

The study examined the possibility of any significant relationship between tax gap and infrastructural development in Nigeria for the period 1981-2018. The results show that there is a positive and significant relationship between Companies Income Tax gap and government capital expenditure on economic services and revealed that Companies Income Tax gap is a significant factor influencing changes in government capital expenditure. Similarly, there is evidence that Custom and Excise Duties tax gap have a positive significant relationship with infrastructural development in Nigeria. Studies in conformity with this study include but not limited to, Asaolu, Olabisi, Akinbode and Alebiosu (2018); Adegbie and Daniel –Adebayo (2017) and Adegite (2015). Asaolu, Olabisi, Akinbode and Alebiosu (2018) examined the relationship between tax revenue and economic growth in Nigeria from 1994 to 2015 using annual data and their study revealed that Custom and Excise Duties showed a positive relation with growth. Similarly, Adegbie and Daniel –Adebayo (2017), conducted a study on taxation and development of capital expenditure for the years1996 to 2017 in Nigeria. Using ordinary least square regression, their results show that CIT had a significant effect on the economy. Adegite (2015) empirically analyzed the effect of CIT on the Nigerian economy for the period 1993-2013. Using secondary data, the result showed that CIT has a positive significance to the Nigerian economy in terms of growth and revenue. Ibadin and Oladipipo (2016) utilized the Error correction model to evaluate the impact of Custom and Excise Duty on economic development and found that Custom and Excise Duty had a positive and significant effect on Nigerian`s economic development between 1981- 2014. Nse and Anietie (2018) in their study revealed that inflation has a negative effect of economic growth and business activities in Nigeria and the outcome of this study align with that position. Anyanwu, Ananwude and Okoye (2017) noted that exchange rate has an effect on the real economy and this agrees with the outcome of this study.

Conclusion and recommendation

The main objective of this study was to examine the effect of tax gap on infrastructural development in Nigeria. The outcome of the results developed to accomplish the objective revealed that tax gap had a significant positive relationship on capital expenditure on economic services in Nigeria. Prior empirical studies have also revealed that tax revenue was significantly related to economic growth and development. There are evidences in literature that also suggest that tax revenue does not significantly affect economic growth and development. So, this work found support in the outcome of prior studies that reported that tax revenue was significantly related to economic growth and development. Consequently, the conclusion of this study is that tax gap has an effect on infrastructural development in Nigeria. This study therefore recommends that government should focus on improving infrastructural development so as to facilitate nationwide growth and development by increasing concentration on tax revenue heads that have a significant positive effect on Infrastructural such as Companies Income Tax and Custom

and Excise Duty. This can be done by enacting policies to increase the tax net by encouraging newly enumerated tax payers to pay voluntarily in the first few years before applying a strict tax computation rule in subsequent years also, punitive measures to discourage corruption in the tax administration and collection process must be introduced.

REFERENCES

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.

Adegbie, F. F., &Fakile, A. S. 2011. Companies Income Tax on and Nigeria economic development.*European Journal of Social Sciences*, *22*(2) 309-319.

Adegbite, A. 2015. The Analysis of the Effect of Corporate Income Tax (CIT) on Revenue Profile in Nigeria. *American Journal of Economic, Finance and Management,1*(4) 312-319.

Adegbite, A. 2018. Value Added Tax and economic growth: The Nigeria experience (1994 -2010). *International Journal of Research in Commerce, IT & Management*, *3*(3) 85-90.

Adeosun, K. 2017. Nigeria`s Tax to GDP ratio among the lowest in the world. *Thisday Newspapers,* p. 5.

Adeoti, J. O. 2010. Investment in technology and export potential of firms in southwest Nigeria. AERC Research Paper 231. Nairobi: African economic research consortium.

Akintoye, I. R., Onakoya, A., Amos, B., & Olayinka, M. I. 2015. Infrastructural decay in Sub-Saharan Africa: Evidence from the Nigerian manufacturing sector. *International Journal of Economics and Financial Research*, *1*(8) 113-122.

Amassoma, A., Sunday, K. O., &Oyendikachi, E. 2018. The influence of money supply on inflation in Nigeria. *Journal of Economics and Management.31*(1) 5-23.

Anyanwu, F., Ananwude, A., & Okoye, N. 2017. Exchange rate policy and Nigeria economic growth: a granger causality impact assessment. *International Journal of Applied Economics, Finance and Accounting. 1*(1), 1- 13.

Ariyo, A., &Bekoe, W. 2014. Currency demand, the underground economy and tax evasion: Case of Nigeria. *Journal of Monetary and Economic Integration, 2*(2) 130-157.

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.

Brownlee, E. W., & Ide, E. 2013. *Shoup and international tax reform after the Japan mission. in the political economy of transnational tax reform - The Shoup mission to Japan in historical context.* Cambridge,: Cambridge University Press.

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.

Chauvet, L., & Ferry, M. 2016. Taxation, infrastructure and firm performance in developing countries. *World Institute for Developing Economic Research Working Papers series 103*.

Chete, L. N., Adeoti, J. O., Adeyinka, F. M., & Ogundele, O. O. 2014). Industrial development and growth in Nigeria: Lessons and challenges. World Institute for Development Economic Research Working Paper 2014/019.

Chingoiro, S., &Mbulawa, S. 2016. Economic growth and infrastructure expenditure in Kenya: A Granger-Causality approach. *International Journal of Social Science Studies, 4*(9) 1–9.

Collier, P., & Venables, A. 2016. Urban infrastructure for development . *Oxford Review of Economic Policy, 32*(3) 391-409.

Connolly, M., & Li, C. 2016. Government spending and economic growth in the OECD countries. *Journal of Economic Policy Reform, 19*(4) 386–395.

Danquah, M., & Osei-Assibey, E. 2016. Informality and the tax gap: A case of non-farm enterprises in Ghana. *International Growth Centre, 11*(1)1-37.

Darma, O. 2014. Federal capital expenditure and its impact on economic growth in Nigeria; 1980–2010. *Developing Country Studies, 4*(4) 24–33.

Edame, G. 2012. Switching regression analysis of public expenditure on infrastructure and economic growth in Nigeria. *Multi-Disciplinary Journal of Research and Development perspective, 1*(2) 9-43.

Edame, G. E., & Fonta, W. M. 2014. The impact of government expenditure on infrastructure in Nigeria: A co- integration & error correction specification. *International Journal of African and Asian Studies, 3*(7) 50–63.

Fasoranti, M. M. 2013). Tax productivity and ecoomic growth . *Lorem Jornal of Buisness and Economics, 1*(1) 1-10.

Gabriel, C. N., & Johnson, I. O. 2015. Capital expenditure at disaggregated level and economic growth in Nigeria: An empirical analysis. *International Journal of Science and Research, 4*(6) 729-737.

Gale, W. G., & Samwick, A. A. 2014. Effects of income tax changes on economic growth . *Economics Studies, 2*(4) 99-118.

Gaspar,V., Jaramillo, L., & Wingender, P. 2016. Tax capacity and growth: Is there a tipping point? IMF Working Paper No 16/234.

Harremi, M. 2014. A simple analysis of the tax gap Balkan region. *Mediterranean Journal of Social Sciences, 5*(19)114-131.

HRMC Annual tax report 2013.

Ibadin, P. O., & Oladipupo, A. O. 2015. Indirect taxes and economic growth in Nigeria. *Ekon. Misaoipraksadbk, 2*(7)345-364.

Inyiama, O. I., & Ubesie, M. C. 2016. Effect of value added tax, customs and excise duties on Nigeria economic growth. *International Journal of Managerial Studies and Research, 4*(10) 53-62 .

Joseph, U. M., Ikechukwu, I. O., & Amah, K. O. 2016. An assessment of the causal relationship between economic growth and indirect taxes in Nigeria. *International Journal of Development and Economic Sustainability, 4*(5) 56-65.

Khwaja, S. M., & Indira, I. 2014. Revenue potential, tax space, and tax gap: A comparative analysis. Policy Research Working Paper 6868.

Macek, R. (2014). The impact of taxation on economic growth: Case study of OECD Countries. *Review Of Economic Perspectives, 14*(4) 309-328.

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.

Murphy, R. 2014). *The tax gap, tax evasion in 2014 – And what can be done about it.* London: Public and Commercial Services Union.

Nalishebo, S., & Halwampa, A. 2014. Uncovering the unknown: An analysis of tax evasion in Zambia. *Zambia Institute for Policy Analysis and Research. Working Paper No. 18.*

Nchor, D., & Adamec, V. 2015. Unofficial economy estimation by the MIMIC model: The Case of Kenya, Namibia, Ghana And Nigeria. *http://dx.doi.org/10.11118/ actaun201563062043 Latest date accessed 20.4.2019.*

Nse, S. U., & Anietie, S. I. 2018. A predictive model for inflation in Nigeria. *CBN Journal of Applied Statistics. 9* (2), 103-129.

Nwaoha, W. C., Ejem, C. A., Egwu, C. C., Ugoji-Eke, P. N., & Nwabeke, C. E. 2017. An error correction model analysis of the effect of total external debt on the Nigerian economy (1980–2015). *International Journal of Economics and Financial Research, 3*(8) 119-129.

Nworji, I. D., Okwu, A. T., Obiwuru, T. C., & Nworji, L. C. 2012. Effects of public expenditure on economic growth in Nigeria: A disaggregated time series analysis. *International Journal of Management Sciences and Business Research, 1*(7) 226-235.

Odior, E. S. 2011. Government spending on education, economic growth and long waves in a CGE micro-simulation analysis: The case of Nigeria. *British Journal of Economics, Finance and Management Sciences, 1*(2) 74–87.

Onukwuli, A.G., Akam, U.G., & Onwuka, E. M. 2014. Challenges of small scale industries in sustainable development in Nigeria. *Journal of Business and Management, 16*(5) 19-25.

Onwe, C. 2015. Implication of external debt financing on Nigeria economic growth (1981 - 2013). *The Nigerian Journal of Economic and Social Studies, 2*(21) 78-97.

Raczkowski, K. 2015. Measuring the tax gap in the European economy. *Journal of Economics and Management, 21*(3) 58-72

Raczkowski, K., & Mroz, R. 2018. Tax gap in the global economy. *Journal of Money Laundering Control, 2*(5) 567-583.

Rotz, W., Murlow, J., & Falk, E. 1994. The 1995 taxpayer compliance measurement program. Sample redesign: A case history. Jamerson, B. and Alwey, W. (eds.): turning administrative system into information system. Internal revenue service, Washington. 121.

Schneider, F., Raczkowski, K., & Mroz, B. 2015. Shadow economy and tax evasion in the EU. *Journal of Money Laundering Control, 18*(1) 34-51.

Sulaiman L. A., & Azeez, B. A. 2012. Effect of external debt on economic growth of Nigeria. *Journal of Economies on Sustainable Development, 3*(8) 25-42.

Udeh, S. N., Ugwu, J. K., & Onwuka, I. O. 2016. External debt and economic growth: The Nigeria experience. *European Journal of Accounting Auditing and Finance Research, 4*(2) 33-48.

Udoka, C., & Anyingang, R. A. 2015. The effect of public expenditure on the growth and development of Nigerian economy (1980–2012). *International Review of Management and Business Research, 4*(3) 824–835.

Usman, A. 2018. an examination of the size of personal income tax gap in Kaduna state, Nigeria. *Journal of Humanities and Social Science, 23*(10) 34-42.

Warren, N. 2018. Estimating tax gap is everything to an informed response to the digital era. *UNSW Business School, Taxation and Business Law.*

World Bank 2012. World development indicators'. Washington, DC: World Bank.

Yousuf, M., & Jakaria, S. M. 2013. Elasticity and buoyancy of major tax categories: Evidence from Bangladesh and its policy implications. *Research Study Series*, *3*(1) 49–82.

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