VOL. 05 NO. 7,
AUGUST, 2024
E-ISSN 3026-9679
P-ISSN 3026-9423

African Scholar Publications & Research International
www.africanscholarpub.com

Journal of Business Dev. and Management Res. (JBDMR)

Moderating Role of Technological Innovations on the Relationship between Non- Oil Tax Revenue and Economic Growth in Nigeria

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Abstract

This study examined the moderating effect of technological innovation on the relationship between Non-Oil Tax Revenue and Economic Growth in Nigeria from 1994 to 2023.Non-Oil Tax Revenue was using CIT, PIT, CGT, VAT, STD, CSD and Economic Growth. The data relating to Non-oil tax revenue was collected from the statistical reports of Federal Inland Revenue Service. The RGDP data was retrieved form the Central Bank of Nigeria statistical bulletin and the moderating variable of Technology Innovation was measured using Global Innovation Index (GII). The descriptive statistics result indicated that the data constituted thirty observations. The hypotheses tested revealed that non-oil tax revenue has positively impacted in Nigerian Economic Growth in Nigeria. More so, the result of the hypothesis indicated that Technological Innovations moderates the relationship between non-oil tax revenue and Economic Growth in Nigeria. The result of the ordinary least square method analysed using SPSS V 20 stated that the R value of and the R square value of 0.975 and 0.950 respectively indicted that there exists a significant relationship between the dependent, independent and the moderating variables of the OLS model estimated. It shows that the significant relationship is explained by 97.5% and 95.0% of the values of the R and squared. It was recommended that the Federal Inland Revenue Service of Nigeria should improve the collection of non-oil tax revenue by taking the advantage of the technological innovations. The government of Nigeria should improve on adherence to proper accountability and transparency in the disbursement of the non-oil tax revenue to finance the national budget of Nigeria.

Keywords: Tax Revenue, Economic Growth, Technology, Innovation, Economic Development.

Introduction

Basically, achieving sustainable increase in the national output of various countries of the world over a consecutive period of time has been one of the paramount macroeconomics goals among the nations of the world. In other words, it is one of the means of achieving sustainable economic development among nations of the world. More so, building a sustainable economic growth and development has always been one of the most important macroeconomic concerns among the countries of the world (Ngaphan *et al,* 2020). In another instance, Alao & Adegbie, (2023), acclaimed that the supply chain of the world economy experiences some disruptions as a result of the economic recessions of 2016 and 2021. Consequently, 2.9% global increase in output was achieved for 2022 in place of 6.10 % recorded in 2021. Moreover, the GDP growth in advanced economies was 2.50 % in 2022, compared to 5.20 % in 2021 (World Bank, 2022). In advance countries such as United States of America, Japan and Germany, the Gross Domestic Growth values of 5.70, 1.70 and 5.40 % was recorded in 2021. Similarly, the economic growth in Emerging Markets and Developing Economies (EMDEs) was recorded as 3.60 % in 2022, compared with the 6.80 % recorded in 2021. More so, economic growth of 4.60 % was achieved in sub-Saharan Africa (SSA) in 2021 (CBN, 2022).

In developing countries such as Nigeria, it is stated that the contributions that form the basis for the economic growth emanates from various major sectors such as agriculture, industry, construction, trade and service sectors which exist within the economy (CBN, 2020). Most of the contributions are realize in a form of improved volume of business activities measured in monetary terms. The monetary measure of all values of economic activities contributed by the various sectors is what is referred to as Gross Domestic Product. Even though there are other measures of economic growth such as the Gross National Product, National Income, Net National Income and Per Capital Income, Growth Domestic Product is the most popular and globally acclaimed measure of economic growth (Idisi & Agbonika, 2010). Furthermore, the unprecedented level of fluctuations in economic activities occasioned by economic instability remains a serious source of concern among researchers and policy makers in Nigeria. Moreover, the Nigeria's growth pattern, as exemplified by annual growth in GDP has been a stunted and seems to drag the economy towards the doldrums. According to the World Bank (2021), Nigeria's GDP, which experienced an adverse growth of -1.6% in 2016 grew marginally by 0.8% by the end of the following year of 2017. By 2018 and 2019, the value of the GDP further increased by 1.9% and 2.2% respectively. In 2020, the value of GDP again nose-dived by -1.8%, the second of its kind within just five years. The value of the GDP improved to 3.4% in 2021. The foregoing statistics clearly show the trend of fluctuations occasioned by instability in the economic activities in Nigeria for the period of 2008 to 2021, (NBS, 2022).

In another development, taxation has been an indispensable tool of government fiscal policy that influence the tax revenue generation used in financing the government expenditure towards the provision of the social welfare to the citizens of the nations of the world. In another instance, raising revenue is one of the reliable means of financing of the public expenditure for the provisions of the social amenities such health, education, security stable and consistent legal proceedings, good roads portable water, frequent electricity supply and many more (Shili & Panjawani, 2020). In

another development, the speed at which economy grows depends on resources mobilization and allocation. This is in consonance with the amount of revenue generated by the various sectors of the economy to meet countries goals and objectives. In most of the civilized economies of the world, taxation form the basis for the most reliable source of revenue used in financing the government expenditures for the provision of the social infrastructure to the citizens of nations. This is done by allocation of resources through the instrumentality of national budgets on the basis of the economy's fiscal priorities and the quantum of the revenue realized at a particular period of time (Mulki, *et al.,* 2022). In other words, taxation has been one of the reliable government revenue sources that is used to stimulate the expansion of economic growth through financing budgets that aroused as result of governments spending more than the anticipate revenue to be raised. An important aspect of fiscal expenditures for any economy is how revenues can be raised to meet spending targets and stimulate the desired level of economic growth. In addition, meeting the needs of the societies require huge amounts of resources which could be contributed on sustainable basis through taxation as one of the reliable and consistent sources of revenue for the government (Nakah, 2018).

In Nigeria, government spending on the infrastructural development forms the basis for full employment, price stability and increase in production of goods and services within the country which is to a large extent meant to sustain economic development (Yahaya & Kabir, 2022). Moreover, tax revenue contributed 59.55% and 63.94 % to the Nigeria's total revenue in the 2021 and 2022 budgets financing. (FIRSG, 2023). These explained one of the reasons for the government's effort in efficient and effective management of tax revenue sources to ensure adequate financing of the country's economic growth and development. Moreover, considering the vast economic potentials arising from enormous economic resources including large and active population and the need for survival and growth of the Nigerian economy, taxation is one of the reliable sources of revenue required to be adequately explored in Nigeria (John, & Elayo, 2018). This testifies to the fact that taxation has been one of the pillars upon which the growth and development of the Nigerian economy mainly rest on (Nami, 2022). Moreover, tax revenue has been categorized based on many perspectives. Some of the methods of classification include classification based on the tax incidence, classification based on the tax rates and classification based on nature of economic resources (Kriz, 2019). However, classification based on the nature of economic resources was adopted for the purpose of this research. In this scenario, tax revenue has been divided in to oil and non-oil tax revenue. More so, all non-oil tax types administered by the Federal Inland Revenue Service and the Nigerian Customs Service were adopted in the cause of this study. These consist of Company Income Tax, Personal Income Tax, Value Added Tax, Stamp Duties, Custom and Excise Duties, Tertiary Education Tax and Information Technology Development Levy (Yahaya & Yunusa, 2019).

Furthermore, the advent of the technology innovation has been an indispensable tool that is used to promote the activities of tax revenue generation and poster the economic growth in many developed and developing countries of the world. In Nigeria, there are so many technological innovations introduced to shape the Nigerian economy. These include the aggrotech, the renewable energy solutions, the e-government initiatives, the e - learning technological innovations, the fintech financial inclusion solution and other online distance learning social networking tools

(Aminu, 2021). The advent of the technological innovations used in the Nigerian economy have greatly impacted on the on the economic development of Nigeria. These are in the area of creation and modification of various e- learning platforms, tuteria, virtual reality in education, open data Nigeria, e- tax solutions and various e -libraries across the globe. Moreover, digital technologies of the 21st centuries have been deeply impacting in all domains of life being it socially, economically, politically educationally and so on. They have form important sources of changes in the way people interact with one another in the various societies of the world (Sykili, 2019).

Despite the invaluable importance of non-oil tax revenues and its invaluable contribution to the Nigerian economy, not much attention was paid to the investigation of the impact of non-oil tax revenue on the economic growth of Nigeria. It is against this backdrop that the current study is structured to examine the effect of non-oil tax revenue on the economic growth of Nigeria covering the period of 1994 - 2023. Additionally, in accordance with previous studies conducted by different researchers such as Collaku, Balaj and Hajdidni (2023), Yossinomita, Haryadi, Saidin and Zulfaneti (2023), Giantoro (2023), Ekpeyoung and Adewoyin (2023) and many more who in most cases indicated significant positive and negative relationship between taxation and economic growth in their studies. This study was structured to introduce technological innovation as the moderating variable to mitigate the effect of the inconsistencies in the previous findings and to strengthen the relationship between the variables adopted by this study ((Nwangi and Kariuki, (2017) & Abdul Rahman, et al, (2018)).

H_{01}: Company Income Tax has no significant effect on economic growth in Nigeria.

$H_{0\,2}$: Value Added Tax has no significant effect on economic growth in Nigeria.

$H_{0\,3}$: Personal Income Tax has no significant effect on economic growth in Nigeria.

H_{04}: Capital Gains Tax has no significant effect on economic growth in Nigeria.

$H_{0\,5}$: Stamp Duty have no significant effect on economic growth in Nigeria.

$H_{0\,6}$: Tertiary Education Tax has no significant effect on economic growth in Nigeria.

H_{07}: Does Technological Innovations Moderates Relationship between Company Income Tax and economic growth in Nigeria.

H_{08}: Does Technological Innovations Moderates Relationship between Value Added Tax and economic growth in Nigeria.

H_{09}: Does Technological Innovations Moderates Relationship between Personal Income Tax and economic growth in Nigeria.

H_{10}: Does Technological Innovations Moderates Relationship between Capital Gains Tax and economic growth in Nigeria.

H_{11}: Does Technological Innovations Moderates Relationship between Stamp Duty and Economic growth in Nigeria.

H_{12}: Does Technological Innovations Moderates Relationship between Tertiary Education Tax and Economic growth in Nigeria.

Empirical Review

Many international and local studies have been conducted in the area of tax revenue and economic growth in various countries of the world. Some of the empirical studies reviewed in the cause of this research are as follow:

Collaku, Balaj and Hajdidni (2023), examined the relationship between tax revenue and economic growth of Kosovo. The study adopted a quarterly time series data collected from the statistical

agency and ministry of finance of Kosovo for period of 2010 to 2021. The statistical tools of analysis used in the research include Johansen co integration test and Vector Error Correction Model (VECM). The Johansson Co integration test result indicted the presence of the co integration among the variable. More so, the result of the empirical analysis (VECM) indicted that Tax Revenue has insignificant effect on economic growth of developing countries such as Kosovo in the long run. The study recommended that the government of Kosovo should improve on the tax revenue collection methods and regularly evaluate its tax policies to reposition the tax system of Kosovo. However, the study investigated a cumulative tax revenue collection of Kosovo as against studying the individual tax types which will provide compressive result that will give an insight in to the contribution of the individual taxes to the Kosovo economy.

Giantoro (2023), investigated the impact of Non-Oil and Gas sectors revenue on Economic Growth of Indonesia. Secondary time series data collected from the annual report of the Federal Ministry of Finance's official website for the period of eighteen years (2003 – 2020). The variables used in the study consist of the Value Added Tax (VAT), Corporate Income Tax (PPhB), Personal Income Tax (PPhP), Custom and Excise Duties (CED) and Certain Building and Land Taxes (PBB- P3) used to measure the non-oil and gas sectors revenue. While, Real Gross Domestic Growth (RGDP) was used to measure the economic growth of Indonesia. The statistical techniques used in the cause of the data analysis include descriptive statistics, unit root test, the co-integration test and Ordinary Least Squares method model. The result of the descriptive statistics analysis revealed that all the variables of the study are normally distributive around the mean. The result of the unit root test indicated that all the variables are stationary at level with integration order of I (0). The co integration order indicted that there exists no long run relationship among the variables of the study. The result of the ordinary least square method revealed that VAT, PPhB, CED, and PBB – P3 have significant effect on the economic growth of Indonesia. The study recommended that the government should deploy more strategies to improve tax revenue collection the country. It is hoped that improving the tax revenue collection will improve the welfare of the citizens of the Indonesia. However, the data covered 2003 -2020. Thus, did not cover the period of the economic recession of 2021. The study was conducted in Indonesia based on the economic situation of Indonesia which may be different from that of Nigeria.

Ekpeyoung and Adewoyin (2023), investigated the relationship between financial development, Tax policies and economic growth of sub-Saharan Africa. The adopted a secondary panel data from a sample of twelve countries of West Africa, Southern Africa and Eastern Africa. The countries selected consist of Nigeria, Senegal, Mali, Benin, Burkina Faso, Cameroun, Cape Verde, Ghana, South Africa, Namibia, Lesotho, Kenya and Tanzania. Moreover, the Panel data were collected from the World Development Index of the World Bank for the period of 2000 to 2019. The variables of the study consist of the Foreign Direct Investment (FDI), Money Supply (MS), Private Sector Credit (Private), Total Liquid Liabilities (TLL), Inflation (INF), Population (POP), and Tax used to describe that independent variable of Financial Development and Taxation. While, Gross Domestic Growth (GDPGR) was used to measure the economic growth in Nigeria. The statistical tools used in the data analysis consist of the Residual Panel Unit Root Test (RPURT) and the Pooled Mean Group Autoregressive Distributive Lag Model (PMG ARDL). The result of the RPURT unit root test indicted the presence of both stationarity at level and at difference which signifies the integration order of I (1) and I (0). The result of the empirical result indicted that Private sector and Foreign Direct investment are positively insignificant on the economic growth

of the Sub-Saharan African Countries. Moreover, the Money Supply, Inflation, Total Liabilities, Privates Credit and Population are insignificant on the economic growth of Sub-Saharan African Countries due to their variations across the countries. The study recommended that Sub Saharan African countries should promote fiscal and monitory policies that will improve revenue generation there by improving the economic growth among the countries located in the sub-Saharan Africa. However, the study investigated a cumulative tax revenue collection of sub-Saharan African countries as against studying the individual tax types which will provide compressive result give insight in to the contribution of the individual taxes to the economic growth of sub-Saharan African Countries.

Eze (2023), examined the Impact of Non-Oil tax Revenue on Economic Growth in Anglophone and Francophone countries. Secondary yearly Panel data were collected from the statistical bureau of 5 Anglophone and Francophone countries such as Nigeria, Ghana, Mali, Togo and Burkina Faso and the World Bank Data Index (WDI). The variables of the study include Capital Gains Tax (CGT), Custom and Excise Duties (CED), Personal Income Tax (PIT). The result of the analysis revealed that Capital Gains Tax and Personal Income Tax (PIT) had positive and significant effect on the economic growth of both Anglophone and Francophone countries. Custom and Excise Duties had positive but insignificant effect on economic growth in Nigeria. The study recommended that government of the Anglophone and Francophone countries should review capital gains tax collection modality with a view of incorporating public enlightenment programmed. That should involve awareness campaigns on who should pay how to compute, where to pay, and when to pay. However, the study was constrained by adopting few aspects of tax revenue such as Company Income Tax, Custom and Excise Duties and Capital Gains Tax at the expense of other aspect of tax revenue such as, Stamp Duties, Custom and Excise Duties, Tertiary Education Tax and National Information Technology Development Levy which have not been incorporated in the study.

Stephen (2023), examined the relationship between Tax Revenue and Nigerian Economic Growth. Secondary time series data collected from the Ex – Post facto research design was adopted in the cause of the research undertaking. Secondary time series data collected from the quarterly tax revenue statistics reports of the Federal Inland Revenue Service, statistical reports quarterly statistical reports of the National Bureau of statistics and the statistical bulletin of the Central Bank of Nigeria for the period of twenty-eight years (2003 – 2021). The variables used by the study includes Value Added Tax, Petroleum Profit Tax and Company Income Tax were used to measure the Tax Revenue in Nigeria. While, Real Gross Domestic Growth was used to measure the economic growth of Nigeria. The statistical tools used in the data analysis includes the descriptive statistics, correlational matrix, the unit root test and the ordinary least squares method. The result of the descriptive statistics indicated that all the variables are normally distributed around the mean. The result of the correlational matrix analysis indicted that all the variables of the study are normally correlated and did not contain any evidence of multicollinearity. The unit root test of stationarity indicated that all the variables of the study are stationary at level with integration order of I (0). This indicted that ordinary least squares method was chosen re the empirical means of data analysis. The result of the empirical analysis indicted that PPT, PIT, CIT and VAT have significant relationship with the economic growth of Nigeria. The study recommended that government should develop workable strategies that would minimize correction and wide spread leakages in the Nigerian tax administration. However, the study was constrained by employing few aspects of

tax revenue such as Company Income Tax, Value Added Tax, Petroleum Profit Tax and Personal Income Tax at the detriment of other tax types such as, Personal Income Tax, Stamp Duties, Education Tax, Capital Gains Tax, National Information and Technology Development Levy assessed and remitted by the Nigerian Taxpayers.

Wanchai, Qi and Xueping (2022), evaluated the impact of taxation on economic growth of China and Thailand. Yearly secondary online panel data were collected from the Central Bank of China and Central Bank of Thailand. The data covered a period of 1999 to 2018. The variables of the study include Personal Income Tax, Corporate Income Tax and Value Added Tax. While, economic growth was measured by using GDP of China and Thailand. Various tests and statistical tools of analysis such as Augmented Dickey Fuller Test, and Regression Analysis were employed in the cause of the data analysis. Based on the ADF tests on China's data, the result of the analysis indicated that none of the variables were stationary at level. All the four variables were stationary at level with integration order of I (0). Based on the ADF tests on Thailand's data, the result of the analysis indicated that all the variables were stationary at level with integration order of I (0). Moreover, the result of the Ordinary Least Square test in China indicated that there is significant positive relationship between personal income tax and economic growth in China. On the other hand, the result of the ordinary least square indicated that there is significantly negative relationship between personal income tax and economic growth in Thailand. Corporate income tax has both in China and Thailand impacted negatively on economic growth of China and Thailand. In Thailand, the value added tax impacted negatively on its economic growth. While, value added tax does not significantly impacted on the economic growth of China. The study therefore recommended that fiscal revenue policy be used to stimulate economic growth of the research countries (China and Thailand). However, the study was constrained by adopting few aspects of non-oil tax revenues at the expense of other aspect of non-oil taxes such as Capital Gains Tax, Stamp Duties Tertiary Education Tax, Custom and Excise and National Information Technology Development Levy that will provide more comprehensive analysis of the non-oil tax revenue in relation to the economic growth in Nigeria.

Nguyen, and Darsono (2022), investigated the impact of tax revenue and investment on the economic growth in Southeast Asia countries. Secondary yearly panel data of economic transactions of South Eastern Asian countries (ASEAN) such as Brunei, Cambodia, Indonesia, Laos, Malaysia, Singapore, Thailand and Vietnam were extracted from the World Bank database for the year 2000 to 2020. The variables of the study consist of the tax revenue, foreign direct investment, inflation. While, the economic growth is measured using the Gross Domestic Index of the Southeastern countries. The statistical tools of analysis involved in the study include descriptive statistics and Ordinary Least Square method. The result of the analysis shows substantial divers in economic growth among ASEAN countries. It was also observed based on the descriptive analysis ASEAN tax revenue have gradually increase over time. While, the average economic growth was not stable. Based on the regression analysis the evaluation between National Investments and Gross Domestic Product per Cumulative Growth (GDPPCG) are in the same direction. Foreign Direct Investment and Growth Domestic Investment contribute positively to economic growth in the ASEAN countries. Thus, economic growth is negatively correlated with the tax revenue in the ASEAN countries. Moreover, the study focuses on optimal tax revenue instead of the optimal tax rates. This implies that higher tax rate restricts productivity – enhancing activities and discourages accumulated investment and labour participation in the productive sector of the economy. Thus, it

was postulated that increasing tax revenue can achieve economic growth in the South Eastern Asian countries. The study was constrained by not covering the 2021 economic recession. However, the research analysis covered the year 2000 to 2020. Moreover, the data covering 2021 has not been included in the cause of the data analysis.

Eugiene (2022), examined the effect of Taxation on the Economic Development with its moderating role of Tax Compliance among Small and Medium Enterprises in Ghana. Primary data using standard questionnaire were collected from a sample of four hundred (400) SMEs out of a population of one thousand SMEs (1000) in Kumasi Ghana from January 2021 to 31st December, 2021. The research design was descriptive, cross sectional and correlational and it's quantitative in approach. The variables used in the study consist of the taxation and tax compliance adopted as independent variable. While, economic development was adopted as the dependent variable.in the Ghanaian economy. The statistical tools of analysis include the descriptive statistics and the regression and correlation analysis methods. The theories adopted by the study were the Deterrence Theory of economic development. The result of the analysis revealed that Taxation and the Tax Compliance are negatively but significantly related. This specified that the path of the moderating is significant. The results further indicated that tax compliance enhanced the effectiveness of taxation to impact on economic growth and development. The moderating role of tax compliance is the relationship between taxation and economic development was low but positive. Based on the findings of this research it was stated that Taxation and Tax Compliance promotes economic development. The study recommended that the Ghanaian government should take into consideration of the taxpayers' compliance, behavior, transparency and accountability in formulating strategies toward tax education services. This is by building taxpayers' confidence through displaying transparency and accountability in the governance there by ensuring enough security of lives and properties as well as provision of necessary infrastructure for the Nigerian citizens. The research was conducted in Ghana. The result reflects the macroeconomic variables of Ghana.

Theoretical Review:

The Lindahl Theory of Taxation: This is a taxation benefit theory conceived by Lindahl (1958) which states that individuals pay for public goods according to their marginal benefits. In other words, the taxpayers comply according to the amount of satisfaction or utility they drive from consumption of additional unit of public goods. A case can be cited in relation to the development of the European countries such as United Kingdom, Sweden, Spain, Australia, Italy, and United States of America where taxpayers' money reflects in the development of the economy. This is through the provision of social welfare and enabling infrastructural facilities such as provision of security of lives and properties, the access roads, standard health facilities, provision of standard education, provision of enabling environment for the growth and sustainability of businesses which impacted positively on employment of the citizens.

Moreover, the theory discusses on the context of two taxpayers who are free to reveal their preferences for states services against corresponding liabilities. This resort to a voluntary exchange between the taxes paid and state services received. In that, Lindahl theory tries to find solution to following decisions: the decision regarding the extent of the state activity of providing public goods, the allocation of expenditure among various goods and services and allocation of burden among taxpayers.

More so, the Lindahl theory used the equilibrium state to describe that all individuals consume the same quantity of goods and services but may face different prices because some people may value a particular good more than others. The Lindahl equilibrium price is the resulting amount paid as tax by an individual represent his or her share of the public goods.

Furthermore, the theory discusses on the context of two taxpayers (individuals and companies) who are free to reveal their preferences for states services against corresponding liabilities. In Nigeria, individuals are subject to Personal Income Tax, Value Added Tax, Stamp Duty and Customs and Excise Duties. While, companies are subject to Company Income Tax, Capital Gains Tax, Value Added Tax, Stamp Duty, Custom and Excise Duties, Tertiary Education Tax and Information Technology Development Levy. More so, the taxpayers require that the quantum of the tax revenue collection be used to finance the government budgets towards the provision of the social welfare and enabling infrastructural facilities such as provision of security of lives and properties, the access roads, standard health facilities, provision of standard education, provision of enabling environment for the growth and sustainability of businesses which impacted positively on employment of the citizens. The output of efficient and effective allocation of the tax revenue drives sustainable increase in the productivity which in the long run results in sustainable economic growth and development in the economy of Nigeria.

Research Methodology

The study employed ex - post facto and correlational research design. The ex-post facto designed was adopted because the study is based on facts after the event which occurred in time past. The data used in the cause of the study is time series in nature covering the period of 1994 to 2023. The correlational design was employed because it is a design that basically seeks to establish the relationships and incidences of influence among variables. The variables of the study consist of the non- oil Tax Revenue collected by Federal Inland Revenue Service and the Nigerian Customs Service used to measure the non - oil tax revenue in Nigeria, Global Innovations Index was used to measure the technological Innovations in Nigeria, and real growth domestic product used to measure the Economic growth in Nigeria for the period of 1994 to 2023. Using SPSS V20, 5% is considered a normal significance level. The failure to reject (acceptance) rejection of the Ho hypothesis criterion was based on the computed R-value.

Population and Sample of the study.

Based on the aggregative nature of the data employed in the cause of this research, the population and sample of the study consists of all limited liability companies and the enterprises that operate in the Nigerian economy with threshold of N25M and above turnover in accordance with Finance act 2021. These include companies and enterprises registered by the Federal Inland Revenue Service and Nigerian Customs Service for the purpose remitting tax revenue in Nigeria, and the Global Innovation Index used measure the Technological Innovations in Nigeria for the period of 1994 to 2023.

Data Source and Method

For the purpose of this study, data were sourced purely from secondary sources. These consist of the secondary yearly time series data on tax revenue collected from the Federal Inland Revenue Service and Nigerian Customs Service for the period of 1994 to 2023. The Real Gross Domestic

Product and Moreover, the data on technology innovation were collected from the Global Innovation Index ratings of the World Intellectual Property Organisation covering the period from 1994 to 2023.

Model specification:

The study used yearly time series data for the period of 1994 to 2023 to investigate the effect moderating effect of information and communication technology on the relationship between non-oil tax revenue and economic growth in Nigeria. The study adopted model specification by Gauss (1809) and Legendre (1995) as opined by Dhakal (2018). While, the moderation effect of information and Communication Technology was due to mitigate the inconsistencies inherent in the previous studies (Hayes, 2017). The Multiple Regression Model Analysis with moderating effect of technological innovation is specified in the following form:

RGDP = f (CIT, VAT, PIT, TET, CGT, STD, NITDL, CED, CIT(TI), VAT(TI), PIT(TI), TET(TI), CGT(TI), STD(TI), NITDL (TI), CED (TI)) .....(1)

Where;

F = factional Relationship

NON - OIL TAX REVENUE = CIT, VAT, PIT, TET, CGT, STD, NITDL, CED.

NON-OIL TAX REVENUE WITH INTERACTIONS (TI). = CIT(TI), VAT(TI), PIT(TI), TET(TI), CGT(TI), STD(TI), NITDL (TI), CED (TI)

CIT = Company Income Tax

PIT = Personal Income Tax

VAT = Value Added Tax

TET = Tertiary Education Tax

CGT = Capital Gains Tax

STD = Stamp Duty

CED = Customs and Excise Duties

RGDP = Real Gross Domestic Product

By having the Multiple Regression Analysis Model as:

Moreover, the above equation can be presented in the form of Multiple Regression Model with moderating effect of Information and Communication Technology in respect of the study of Tax Revenue and Economic Growth in Nigeria as follow:

$$RGDP_t = B_0 + B_1CIT_t + B_2VAT_t + B_3PIT_t + B_4TET_t + B_5CGT_t + B_6STD_t + B_7NITDL_t + B_8CED_t + B_9CIT(TI_t) + B_{10}VAT(TI_t) + B_{11}PIT(TI_t) + B_{12}TET(TI_t) + B_{13}CGT(TI_t) + B_{14}STD(TI_t) + B_{15}NITD(TI_t) + B_{16}CED(TI_t) + \mu_t \quad \ldots\ldots (2)$$

$B_0, B_1, B_2 \ldots, B_n$: are coefficients of variation of the model

μ is the white-noise error term;

t denotes the time subscript.

Results and Discussions

The result of the analysis in descriptive statistics table 4.1 attached indicated that the total observations are 30 (N30) in respect of the dependent, the independent variables and the moderating variable. The mean values of the variables which indicates the average output per

annum in terms of tax revenues, observations and computations in respect of each of the variable. The standard deviation of 720.663, 693.017 and 723.830 in respect of CIT, PIT*IT, and STD*IT respectively indicated less deviations among the variables. While the standard deviation values of 18.280 and 20065.7578 in respects of the CGT and RGDP indicated a wide deviation in the Non-Oil Tax Revenue collection per annum.

Table 4.1 Descriptive Statistics

	Mean	Std. Deviation	N
EGN	c0000	20065.7578496	30
CIT	704.121900	720.6825240	30
CSD	702.4963	771.61473	30
PIT	33.103000	30.9300395	30
TET	125.470333	147.9698229	30
STD	17.996000	39.0191290	30
CGT	9.529667	18.2803681	30
CIT*TI	15524.957	14701.6597	30
CSD*TI	15446.950	15962.4263	30
PIT*TI	750.980	693.0166	30
TET*TI	2809.797	3197.0187	30
STD*TI	361.947	723.8303	30
CGT*TI	215.663	419.9807	30

Moreover, the model summary table 4.2 attached revealed the R value of and the R square value of 0.975and 0.950 respectively which indicted that there exists a significant relationship between the dependent, independent and the moderating variables of the OLS model estimated. It shows that the significant relationship is explained by 97.5% and 95.0% of the values of the R and squared. In addition, the remaining 2.5% and 5.0% of the R and R squared values is explained by other factors or variables that are outside the coverage of this study.

Table 4.2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.975[a]	.950	.928	5384.8314319

a. Predictors: (Constant), CGT*TI, STD, PIT*TI, TET*TI, CIT, CSD, CIT*TI, PIT, TET

The ANOVA table 4.3 reveals that indicted that the value of the F statistic is 42.520 at 29 degrees of freedom (d.f0 and the significant relationship values (P – value) is 0.00. This shows that there exists a significant linear relationship between the variable at 1% level of significance. Though, the criteria for rejection or failure to reject the null hypothesis has been set at 5%. Hence this led to the rejection of the Ho and concludes that there exists a significant linear relationship between the Non-Oil Tax Revenue Tax and the Economic Growth in Nigeria. Moreover, it can be concluded that technological innovation moderates the relationship between Non-Oil Tax Revenue and Technological Innovation in Nigeria. The more the deployment of Innovative technologies such as ICT, efficient and effective human resource policies, monitory and non-monitory motivations the more the Non-Oil Tax Revenue Collection That also will transform to improve in the economic

growth of Nigeria. More so, the significance relationship of the technology innovation to the variables indicated that the introduction of the technology innovation in the tax revenue collection and the efficient disbursement of the Tax Revenue can be used to boost both the economic growth and development in Nigeria.

Table 4.3 ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	11096476313.279	9	1232941812.587	42.520	.000[b]
	Residual	579928191.004	20	28996409.550		
	Total	11676404504.283	29			

a. Dependent Variable: EGN

b. Predictors: (Constant), CGT*TI, STD, PIT*TI, TET*TI, CIT, CSD, CIT*TI, PIT, TET

The coefficient of determination table 4.4 indicated that there exist the regression coefficients, the intercept and the significance to be used in the estimation of the model. The model can be estimated as:

4.4 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	27150.616	1522.082		17.838	.000
	CIT	-18.126	30.427	-.651	-.596	.558
	CSD	.182	6.181	.007	.030	.977
	PIT	269.331	702.761	.415	.383	.706
	TET	33.938	204.074	.250	.166	.870
	STD	-1.877	76.526	-.004	-.025	.981
	CIT*TI	1.815	1.555	1.330	1.168	.257
	PIT*TI	-6.807	33.742	-.235	-.202	.842
	TET*TI	-.981	9.235	-.156	-.106	.916
	CGT*TI	4.123	2.641	.086	1.561	.134

a. Dependent Variable: EGN

RGDP $= 27150.616 - 18.126B_1 + 0B_2 + 269.331B_3 + 33.938B_4 + 0B_5 - 1.877B_6 - 0.162B_7 + 1.815B_9 + 0B_{10} - 6.807\ B_{11} - 98.1B_{12} + 4.123B_{13}) + \ 0B_{14} + +\mu_t$..(2)

DISCUSSION OF FINDINGS

From the hypotheses tested, it was observed that the Non-Oil Tax Revenue has positively impacted in Economic Growth in Nigeria. Moreover, Technological Innovations moderates the relationship between Non-Oil Tax Revenue and Economic Growth in Nigeria. This finding is in line with Adeusi *et al*., 2020, whose study revealed that non-oil tax revenue has significance and positive impact on the economic growth in Nigeria.

RECOMMENDATION

Recommendations

Based on the findings of the study, the study deems it fit to make some necessary suggestions;

1. There is need for a improvements within the activities of the Federal Inland Revenue Service of Nigeria by taking the advantage of the technological innovations there by insisting on online

platforms in the taxpaying organizations such companies and MDAs in discouraging tax evasion in relation to Non-Oil Tax Revenue collection and other forms of taxes in Nigeria. This to realized optimal tax revenue collection to finance the Nigerian budget for the betterment of the Nigerian citizens

2. This research also recommends that the government of Nigeria should improve on adherence to proper accountability and transparency in the disbursement of the tertiary education tax to the Nigerian higher Institutions of learning. This should base on the global practice and the enabling laws in Nigeria to achieve more educational development in Nigeria.

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