

Tax Revenue and Economic Development in Nigeria, an Auto-Regressive Distributed Lag (ARDL) Model

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Abstract

This study was carried out to investigate the impact of tax revenue on economic development in Nigeria between 1981 and 2019. Data employed for this study was elicited from World Bank Data Base: World Developmental Indicators of 2019 and Federal Inland Revenue quarterly publications. This study employed gross fixed capital formation as proxy for economic development in Nigeria, while company income tax, petroleum profit tax and custom and excise duties were adopted as explanatory variables. This study employed Auto Regressive Distributed Lag (ARDL) Model to analyze data, other diagnostic tests such as; unit root test, stability test, test of Normality, Auto correlation test, Heteroskedasticity test and Breusch-Godfrey Serial Correlation LM test were also carried out and they confirmed the validity and reliability of the model employed; the inferential results pointed that company income tax and petroleum profit tax had significant positive impact on gross fixed capital formation in Nigeria, while customs and excise duties recorded a negative significant impact on gross fixed capital formation in Nigeria. The study recommended that government of Nigeria should be more serious with tax collection by rolling new tax reforms that would enhance the collection of company income tax and petroleum profit tax and also ensure that those mechanisms put in place would check tax evasion and tax avoidance. The study further recommended that government should reduce customs and excise duties which will in turn encourage importers to import more and also encourage domestic manufacturers to produce more and contribute towards economic development in Nigeria by increasing the volume of gross fixed capital formation in Nigeria.

Keywords: tax revenue, company income tax, petroleum profit tax, gross fixed capital formation, custom and excise duties.

1. Introduction

1.1 Background to the study

It is the cardinal responsibility of a government of any country to provide social amenities for her citizens, provision of security, protection of life and properties. These are enshrined in the constitution of Nigeria as an obligation the government owes her citizens. Government needs streams of revenue to be able to carry out this sensitive and inevitable responsibility. Tax is a veritable source of revenue for government amongst other sources of revenue available to the government.

It is often said that death and taxes are the only certainties or inevitabilities of this world. Taxation is not a new phenomenon, its emergence is as old as mankind, tax is not merely a revenue generating tool for the government, it could be used to regulate the economy and could also be used to redistribute income by charging higher tax rates to high income earners, while charging lower tax rates for low income earners.

Tax is a mandatory payment levied by the government or appropriate tax authorities on its citizens, business and any other transactions or activities as determined or defined by the government.

Tax is a compulsory payment made by all concerned to the government of a country from which essential services are rendered, without necessarily offering an explanation on how the money generated was spent or equating services with the money collected (Onwuchekwa and Aruwa, 2014).

An efficient and effective tax system is capable of ensuring the basic necessities and services in the country. Taxes are used to achieve economic growth, achieve equity in income and wealth distribution and maintain equilibrium in the economy (Nasira, Haruna and Abdullahi, 2016).

Abomaye-Nimenibo (2017) defined tax as a compulsory contributions made by animate and inanimate beings to government being a higher authority either directly or indirectly to fund its various activities and any refusal is meted with appropriate punishment.

It suffices to say that the level of revenue available to government for the provision of social amenities, protection of life and properties of her citizens is directly influenced by the amount of tax revenue realized through taxation.

It is important to note that a good tax system should always consider the payer's ability to pay, so not to allow too much of the incidence/burden of tax become unbearable to the payer. If this is the case, there is bound to be issue of tax evasion and tax avoidance.

1.2 Statement of problem

There have been several studies on the impact of tax revenue on economic growth of Nigeria with the findings elicited from these studies varying. There have been very infinitesimal number of studies that looked at the impact of taxation on economic development in Nigeria. This study is carried out to empirically investigate the impact of tax revenue on economic development in Nigeria between 1981 and 2019 to actually find out the position and contributions of taxation in Nigeria to economic development and also to evaluate if the revenue generated from tax in Nigeria is properly utilized and harnessed towards pursuant of key macro economic objectives.

This study therefore employs gross fixed capital formation as proxy or measure of economic development on Nigeria, while the different types of tax available to the government will be employed as the regressors in order to capture the impact of tax revenue on economic development in Nigeria. This study will contribute and add to already existing literature on this subject matter

by its findings, methodology, variables employed and currency of this research, since this study is carried out in more recent time than past studies.

This research is structured into five segments or parts. The first part takes care of the introductory aspect of this study, while the second segment reviews related literature; ranging from conceptual review, to theoretical review then the empirical review. The third segment highlights the methodology employed in this study while the fourth part has to do with analysis of data for inference and the final part concludes and proffers policy recommendations.

1.3 Objectives of the study

The main objective of this research is to investigate the impact of tax revenue on economic development in Nigeria

1. To ascertain the impact of company income tax on gross fixed capital formation in Nigeria.
2. To investigate the impact of petroleum profit tax on gross fixed capital formation in Nigeria.
3. To ascertain the impact of custom and excise duties on gross fixed capital formation in Nigeria.

1.4 Research hypotheses

HO1: Company income tax has no significant impact on gross fixed capital formation in Nigeria.

HO2: There is no significant impact of petroleum profit tax on gross fixed capital formation in Nigeria.

HO3: There is no significant impact of custom and excise duties on gross fixed capital formation in Nigeria.

2. Review of related literature

2.1 Conceptual review

2.1.1 Historical background of taxation

According to biblical records, about 1030 BC, the Israelite were under a system of government known as theocracy, there were living without a central government. The people asked Prophet Samuel “to make us a king to judge us like other nations”. (1 Sam. 8:5). Samuel tried to discourage them (1 Sam. 8:11 – 18). The bible episode contained in 1 Sam. 8:1-20 illustrates an aged old norm about government. Government is a necessary institution, but at the same time, there are undesirable aspects. These create mixed feelings towards government, these mixed feelings are inextricably bound up with government taxing and spending activities. The king will provide amenities to the people (for Israelite and army) but only at a cost.

2.1.2 Objectives of taxation

The cardinal objective of taxation in both developed and developing economies is primarily to generate revenue to meet government expenditure for the provision of social amenities, infrastructure and the welfare of the populace.

Taxation is an instrument or a tool of economic regulation. Government uses taxation to encourage or discourage certain forms of social behavior or consumption of certain goods and services. Below are the major tax purposes which can be used to design tax policies:

1. To raise money for the provision of services such as: defense, health services and educational services etc.
2. For redistribution of income and wealth.
3. For the management of the economy.
4. To discourage consumption of harmful goods such as alcohol and cigarette.

2.2 Theoretical review

2.2.1 Socio-political theory

This theory of tax revenue states that social and political objectives should be the major factors in selecting taxes. The theory advocated that a tax system should not be designed to serve individuals, but should be used to cure the ills of society as a whole.

2.2.2 Benefit received theory

This theory is based on the assumption that there is basically an exchange relationship between taxpayers and the state because the state provides certain goods and services to the members of the society, therefore, members of the society should contribute to the cost of these supplies in proportion to the benefits received (Bhartia, 2009). Anyanfo (1996) supports this postulation by saying that taxes should be allocated on the basis of benefits received from government expenditure.

2.2.3 Faculty theory

According to Anyanfo (1996), this theory states that one should be taxed according to the ability to pay. It is simply an attempt to maximize an explicit value judgment about the distributive effects of taxes. Bhartia (2009), shares this same view by arguing that a citizen is to pay tax just because he can, and his relative share in the total tax burden is to be determined by his relative paying capacity.

2.2.4 Expediency theory

This theory asserts that every tax proposal must pass the test of practicality. It must be the only consideration weighted by the authorities in choosing a tax proposal. Economic and social objectives of the state and the effects of a tax system should be treated as irrelevant (Bhartia, 2009). Anyafo (1996) and Bhartia (2009) explained that the expediency theory is based on a link between tax liability and state activities. It assumes that the state should charge the members of the society for the services provided by it. This reasoning justifies imposition of taxes for financing state activities by inferences, which provides a basis, for apportioning the tax burden between members of the society. This proposition has a reality embedded in it, since it is useless to have a tax which cannot be levied and collected efficiently.

2.3 Empirical review

Uzoka and Chiedu, C. (2018) investigated the effect of tax revenue on economic growth of Nigeria between 1997 -2016. The times series data sourced from Central Bank of Nigeria Statistical Bulletin and Federal Inland Revenue Service (FIRS), were analyzed using unit root tests, co-integration tests and vector error correction mechanism (VECM). The unit root test result reveals that CIT and CED and CGT are stationary at level. While RGDP, PPT, VAT and RDT are stationary at first order, that is after first difference. The co-integration tests (both Johansen and Engle-Granger) showed that a long run relationship existed between the economic growth and RGDP, PPT, VAT and RDT CIT, CED. The results obtained from the analysis of the model revealed that CGT and EDT have no significant effect on economic growth while PPT, CIT, VAT and CED have significant effect on the economic growth in Nigeria. The study recommends to boost economic growth in Nigeria, government should ensure the tax revenue generated are channeled towards building capital stock that can create more jobs which will generate more revenue to government through other forms of tax.

Asaolu, Olabisi, Akinbode, and Alebiosu, O. (2018) examined the relationship between tax revenue and economic growth in Nigeria. The study adopted a descriptive and historical research design; secondary data for twenty-two years (1994 -2015) were collected from various issues of the Central Bank of Nigeria (CBN) statistical bulletin and annual reports. Tax revenue as an

independent variable was measured with Value Added Tax (VAT); Petroleum Profit Tax (PPT); Company Income Tax (CIT) and Custom and Excise Duties (CED) while the dependent variable was Economic Growth (EG) proxied by the Gross Domestic Product (GDP). Analysis was performed on data collected using Auto Regressive Distributed Lag (ARDL) Regression and other post estimations (Jarque-Bera test; Breusch-Godfrey LM and Ramsey Reset Test) to determine the existence of relationship between the variables. The results of the study showed that VAT and CED had a significant relationships with economic growth ($p < 0.05$), while CIT has negative significant relationship with economic growth ($P < 0.05$). However, PPT had no significant relationship with economic growth. The study concluded that the role of taxation in nation's building is irreplaceable. Taxation remains a strong socio political and economic tool for economic prosperity. It is therefore recommended that government should engage in a complete re-organization of tax administrative machinery to reduce incidence of tax evasion and avoidance to the barest minimum in order to improve tax revenue and bring more people and establishments into the tax net. Also, tax revenue should be judiciously utilized to provide enabling environment for business survival and economic growth in Nigeria.

Oshiobugie and Akpokerere (2019) examined tax revenue and the Nigeria economy from 2000 – 2017: A number of related studies have shown that tax revenue contributed to economic growth. Yet some researchers observed that tax is discriminatory in the sense that it is assessed on persons or property based on profits or income, the benefits derived by citizens from tax payment is without reference to the contribution of individual tax payers. The main objective of the study was to study the effect of tax revenue on economic growth in Nigeria. Secondary data were sourced from Central Bank of Nigeria Statistical Bulletin of various editions. The study adopted the ex-post facto research design while ordinary least square regression techniques was used to process the data gathered using E-view 8.0 software. The null hypotheses (H_0) were tested at 5% level of significance. the findings revealed that there is insignificant effect of tax revenue on economic growth under the period study and concluded that personal income tax and company income tax affect economic growth in Nigeria either negatively or positively. The study recommends among others that it beholds on Nigeria government to remove the problem of multiple taxation as the presence of multiple tax discourages entrepreneurship businesses in Nigeria.

Ihenyen and Ebipanipre (2014) examined taxation as an instrument of economic growth in Nigeria. Using annual time series data sourced from the CBN statistical bulletin between 1980 and 2013. A linear model of corporate income tax, value added tax and economic growth were estimated by using the OLS technique. The empirical result suggests that the hypothesized link among corporate income tax, value added tax and economic growth indeed exist in the Nigerian context. Thus, the result offer tantalizing evidence that taxation is an instrument of economic in Nigeria. This conclusion points to the need for additional measures by government in ensuring that taxpayers do not avoid and evade tax so that income can be properly generated there from it. In addition, regulatory authorities charged with the sole responsibility of collecting tax should further be strengthened to enforce compliance by tax payers. Above all, the tax collected should be properly distributed so that economic growth can be properly harnessed.

Abomaye, Williams, Samuel and Friday (2018) carried out a study to empirically examine tax revenue and economic growth in Nigeria from 1980 to 2015 by employing Gross Domestic Product (GDP) as the dependent variable and Petroleum Profit Tax (PPT), Company Income Tax (CIT), and Customs and Excise Duties (CED) as the independent variables. The analysis of the

study was carried out using the method of Multiple Regression Analysis. The Ordinary Least Square (OLS) method of econometrics was the main analytical technique that was employed using Econometric software (Eviews 9.0). The broad objectives of their study were to examine the relationship that exists between Petroleum Profit Tax, Company Income Tax, Customs and Excise Duties; and Economic Growth in Nigeria. The Cointegration results revealed that there was a long-run relationship among the variables. The short run regression result also revealed that Petroleum Profit Tax and Company Income Tax has no significant relationship with economic growth in Nigeria. Custom and Excise Duties was found to have a significant relationship with Economic Growth in Nigeria during the period under study. The study therefore concluded that government should ensure that tax revenue is used judiciously to make expenditures on Education, Housing, Transportation, Agriculture, Health, Power, Road construction, National defense, among others that will help the various sectors of the economy to grow and function well enough so that the growth and development of the country shall be enhanced.

3. Methodology

3.1 Research design

This study adopts the *ex-post facto* research design as it deals with event that had taken place and secondary data were readily available for collection. Gross fixed capital formation was adopted as the explained (dependent) variable, while company income tax, petroleum profit tax and custom and excise duties were employed as the explanatory (independent) variables. The model was estimated using the Ordinary Least Square (OLS) method. Since we are making use of annualized time-series data and the study cover a long sample period, we made sure our data set were not impaired by unit root; hence we tested for stationarity of the series by employing the Augmented Dickey-Fuller (ADF).

3.2 Source of data collection

Data for this study are elicited from Federal Inland Revenue quarterly publications and World Bank Data Base: World Developmental Indicators of 2019. The study period covers 1981 through 2019.

3.3 Method of data analysis

This study used descriptive statistics, unit root test, correlation and Auto Regressive Distributed Lag (ARDL) Model in testing the hypotheses of the study. Other diagnostic tests such as; stability test, test of Normality, Auto correlation test, Heteroskedasticity test and Breusch-Godfrey Serial Correlation LM test were also carried out. E-view 9.0 econometric statistical software package was used for the analysis.

3.4 Model specification

This research adapted the economic model previously used by Abomaye, et al (2018) that empirically examined tax revenue and economic growth in Nigeria from 1980 to 2015. The econometric model of this study, which had earlier been reviewed in the preceding section, is specified below:

$$GDP=f(PPT,CIT,CED) \dots\dots\dots (3.1)$$

From the above function, they derived the statistical model as follows:

$$GDP=\alpha+\beta_1PPT_t+\beta_2CIT_t+\beta_3CED_t+\varepsilon \dots\dots\dots (3.2)$$

By transforming the linear function into their log form, we have;

$$GDP=\alpha+\beta_1LPPT+\beta_2LCIT+\beta_3LCED+\varepsilon \dots\dots\dots (3.3)$$

Where;

GDP: Gross Domestic Product

PPT: Petroleum Profit Tax

CIT: Company Income Tax

CED: Customs and Excise Duties

α is a constant

$\beta_1, \beta_2, \beta_3$, are the coefficient of the parameter estimate

ε is the error term or random variable

However, this study adapted the scholars' work by replacing Gross domestic product (GDP) with gross fixed capital formation as the regressand, this was done to capture economic development.

The regression model is specified thus:

$$\text{GFCF} = \beta_0 + \beta_1 \text{CIT} + \beta_2 \text{PPT} + \beta_3 \text{CED} + \varepsilon_i \dots \dots \dots (3.4)$$

Where; GFCF = Gross Fixed Capital Formation

Other acronyms in the model remain as explained above.

3.5 Description of modeled variables

The variables included in the model are classified as dependent and independent variables.

3.5.1 Dependent variable

3.5.1.1 Gross fixed capital formation (GFCF): This is a term used to describe the net capital accumulation during an accounting period for a particular country. It refers to additions of capital goods, such as equipment, plants and machineries tools, transportation assets and electricity. Generally, the higher the capital formation of an economy, the faster an economy can grow its aggregate income.

3.5.2 Independent variables

3.5.2.1 Petroleum profit tax (PPT): The Petroleum Profit Tax (PPT) is for any resident company or person in charge of a non-resident company who are exploring for petroleum or producing it in Nigeria.

3.5.2.2 Company income tax (CIT): Being a tax paid by resident or non-resident company incorporated in Nigeria.

3.5.2.3 Customs and excise duties (CED): These are taxes payable by importers of specified goods as well as those imposed on goods produced locally.

3.6 Decision rule for acceptance or rejection of hypotheses

The decision rule is to reject the null hypothesis if the computed p-value is less than 5% significant level. On the contrary, accept the null hypothesis if the computed p-value is higher than 5% significant level.

3.7 Apriori expected results

Company Income Tax (CIT) is expected to be positively signed.

Customs and Excise Duties (CED) is expected to be positively signed

Petroleum Profit Tax (PPT) is expected to be positively signed

4. Data analysis and interpretation of results

4.1 Pre-estimation test result (Unit Root Test)

Table 4.1 Unit Root Test

Variables	Augmented Dickey-Fuller test statistic	Probability Value	ADF Critical at 5%	Inference

GFCF	-3.450749	0.0153	-2.943427	I(0)
CIT	-8.286318	0.0000	-2.971853	I(1)
CED	-5.265654	0.0001	-2.943427	I(1)
PPT	-4.849731	0.0004	-2.954021	I(1)

Source: Author's analysis using e-view 9 output with data in Appendix

The unit root test from table 4.1 above shows that the stationarity of the variables were a combination of I(1) and I(0). As such, the appropriate estimation technique to employ for inference is the Auto Regressive Distributed Lag (ARDL) Model.

4.2 Descriptive statistics

Table 4.2 Descriptive statistics

	GFCF	PPT	CIT	CED
Mean	36.05112	5536697.	1535723.	280885.3
Median	34.10954	525100.0	24490.00	87900.00
Maximum	89.38105	32010000	18766544	1878754.
Minimum	14.90391	3746.900	403.0000	1616.000
Std. Dev.	19.28696	10221791	4236009.	481040.5
Observations	39	39	39	39

Source: Author's analysis using e-view 9 output with data in Appendix

Table 4.2 describes the variables employed for this study. The descriptive statistics results shows that the mean of gross fixed capital formation, petroleum profit tax, company income tax and custom and excise duties N36.05112 billion, N5536697 billion, N1535723billion and N280885.3billion respectively. The minimum of the variables for GFCF, PPT, cit and CED were N 14.90391billion, N 3746.900 billion, N 403.0000 billion and N 1616.000 respectively. While their maximum were N 89.38105billion, N32010000billion, N 18766544billion and N 1878754for GFCF, PPT, CIT and CED respectively. The standard deviation of N 19.28696, N 10221791, N 4236009and N481040.5for GFCF, PPT, CIT and CED respectively, shows that deviations from the averages of these variables signify that the variables were not fix or static, but varies year in year out. The years under consideration was 39, hence the number of observation being 39.

4.3 Correlation analysis

Table 4.3 Correlation matrix

	GFCF	PPT	CIT	CED
GFCF	1.000000			
PPT	-0.545042	1.000000		
CIT	-0.341259	0.596359	1.000000	
CED	-0.511887	0.569565	0.803816	1.000000

Source: Author's analysis using e-view 9 output with data in Appendix

From the result of correlation analysis in table 4.3 above, all the variables were correlated such that, GFCF had about 55.5% negative correlation with PPT, 34.1% negative correlation with cit and 51.1% negative correlation with CED. While, PPT had about 59.6% positive correlations with

cit and approximately 57% positive correlation with CED. Then, cit had about 80.4% positive correlation with CED.

4.4 Inferential result

Results of ARDL model

Table 4.4 Results of ARDL model

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GFCF(-3)	0.350546	0.126316	2.775142	0.0110
CIT(-4)	1.06E-05	3.02E-06	3.502891	0.0020
PPT	2.82E-07	1.29E-07	2.181129	0.0401
CED	-5.96E-05	1.63E-05	-3.660161	0.0014
C	26.95883	7.307119	3.689393	0.0013
R-squared	0.956280	Mean dependent var	31.31366	
Adjusted R-squared	0.932433	S.D. dependent var	13.19215	
S.E. of regression	3.429128	Akaike info criterion	5.581041	
Sum squared resid	258.6963	Schwarz criterion	6.158741	
Log likelihood	-84.66821	Hannan-Quinn criter.	5.780463	
F-statistic	40.10019	Durbin-Watson stat	1.871030	
Prob(F-statistic)	0.000000			

Source: Author's analysis using e-view 9 output with data in Appendix

The ARDL result as shown in the table above suggests that all the regressors barring custom and excise duties had positive impact on gross fixed capital formation. Custom and excise duties recorded a negative or inverse impact on gross fixed capital formation in Nigeria. The result further revealed that a unit increase in company income tax would bring about a 1.06 unit increase in gross fixed capital formation, while a unit increase in petroleum profit tax would bring about a 2.8 unit increase in gross fixed capital formation. Also, a unit increase in custom and excise duties would bring about 5.9 unit decrease in gross fixed capital formation and vice versa.

The Adjusted R-squared of approximately 0.96 showed that the explanatory variables accounted for about 96% variations in the explained variable. Put differently, about 96% variations in gross fixed capital formation was explained by the independent variables, while the remaining 4% may be attributed to variables not captured in the model.

F-statistic of 40.10019 showed that the model was a good fit as confirmed by its corresponding probability value of 0.000000 which means that the model is significant both at 1% and 5% levels of significance.

Durbin-Watson stat. of approximately 1.96 suggests that the variables were free from auto-correlation since the Durbin-Watson value is very close to 2.

4.5 Test for auto correlation

Table 4.5 Correlogram Q-statistic

Q-statistic probabilities adjusted for 3 dynamic regressors

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*	
. .	. .	1	0.006	0.006	0.0013	0.971
. * .	. * .	2	0.142	0.142	0.7915	0.673
. .	. .	3	-0.010	-0.012	0.7955	0.851
** .	** .	4	-0.215	-0.240	2.7256	0.605
. .	. .	5	-0.059	-0.058	2.8767	0.719
.* .	.* .	6	-0.141	-0.075	3.7584	0.709
. .	. .	7	0.013	0.029	3.7660	0.806
.* .	.* .	8	-0.066	-0.090	3.9765	0.859
.* .	.* .	9	-0.102	-0.150	4.4929	0.876
. .	. .	10	0.043	0.012	4.5905	0.917
.* .	.* .	11	-0.165	-0.148	6.0636	0.869
. .	. .	12	0.009	-0.056	6.0686	0.913
. .	. .	13	0.040	0.024	6.1629	0.940
.* .	.* .	14	-0.141	-0.189	7.3876	0.919
. * .	. * .	15	0.179	0.085	9.4517	0.853
. .	. .	16	-0.044	-0.039	9.5866	0.887

Source: Author's analysis using e-view 9 output with data in Appendix

This test is carried out to further test for auto correlation and to consolidate the result of Durbin Watson Stat. The result of Correlogram Q-Statistic in table 4.5 above, suggest that the variables are free from auto correlation.

The correlogram Q- Stat. table indicates that all p-values were >5% hence the conclusion that the model was free from auto correlation.

4.6 Test for serial correlation

Table 4.6 Serial correlation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.422159	Prob. F(2,20)	0.6613
Obs*R-squared	1.417707	Prob. Chi-Square(2)	0.4922

Source: Author's analysis using e-view 9 output with data in Appendix

In line with the rules, the Breusch-Godfrey Serial Correlation LM Test table above shows that the probability values of 0.6613 and 0.4922 are statistically insignificant at 5% level of significance. That is, the p-values (< 5%) Thus, we reject the null hypothesis that the model is not free from serial correlation and therefore submit that the model is free from serial correlation.

4.7 Test for heteroskedasticity

Table 4.6 Test for heteroskedasticity

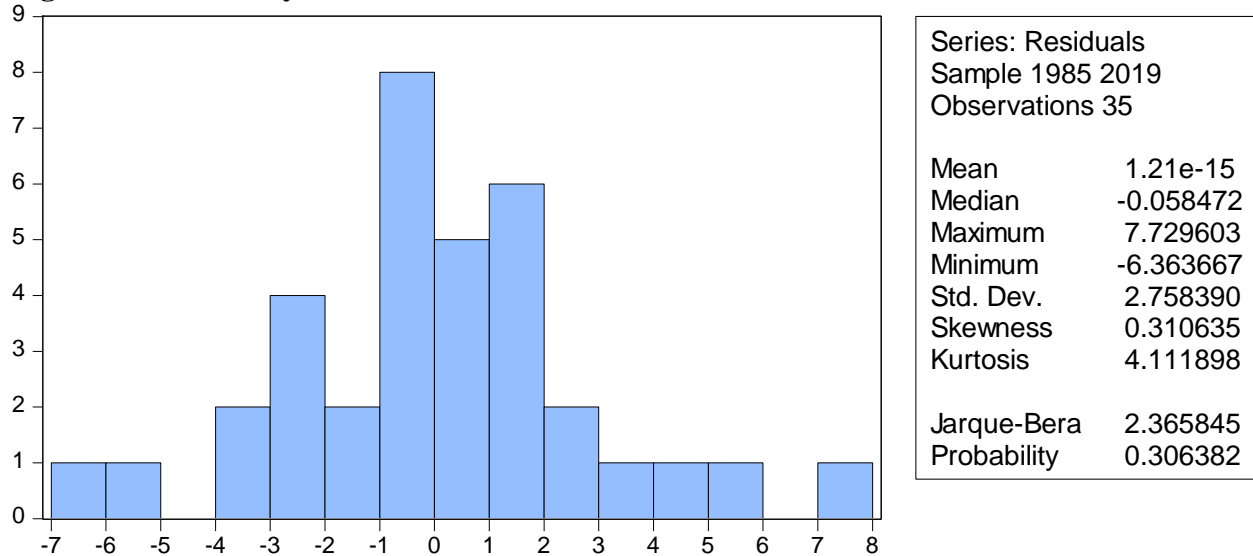
Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.088925	Prob. F(12,22)	0.4144
Obs*R-squared	13.04210	Prob. Chi-Square(12)	0.3660
Scaled explained SS	8.017741	Prob. Chi-Square(12)	0.7837

Source: Author's analysis using e-view 9 output with data in Appendix

The Heteroskedasticity test above suggests that the variables are free from the problem of Heteroskedasticity since the p-values of F-stat. and Obs*R-squared of 0.4144 and 0.3660 respectively are > 5% significance level. This outcome is further strengthened by the p-value of the Scaled explained SS (0.7837) which also suggest the absence of Heteroskedasticity.

4.8 Test for normality

Figure 4.8 Normality chart

Source: Author's analysis using e-view 9 output with data in Appendix

This test is conducted to ensure that the data employed in this study are normally distributed. Observing from the normality diagram in figure 4.8 above, as well as the Jaque Bera value of approximately 2.37 and its p-value of 0.30 which is >5% significant level, confirms that the data are normally distributed.

4.9 Stability diagnostic test

Table 4.9 Ramsey RESET test

Ramsey RESET test

Equation: UNTITLED

Specification: GFCF GFCF(-1) GFCF(-2) GFCF(-3) CIT CIT(-1)
 CIT(-2) CIT(-3)

CIT(-4) PPT PPT(-1) PPT(-2) CED C

Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	0.172444	21	0.8647
F-statistic	0.029737	(1, 21)	0.8647

Source: Author's analysis using e-view 9 output with data in Appendix

From the Ramsey reset test result in table 4.9 above, the t-statistic of 0.172444 and its corresponding p-value of 0.8647 suggest that the model is correctly specified, so null hypothesis of linear specification not rejected at 5% level of significance. That is, p-value (<5%).

4.10 Test of hypotheses

4.10.1 Test of hypothesis one

HO1: Company income tax has no significant impact on gross fixed capital formation in Nigeria.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GFCF(-3)	0.350546	0.126316	2.775142	0.0110
CIT(-4)	1.06E-05	3.02E-06	3.502891	0.0020

Source: Extracted from table 4.4

Since the p-value of company income tax (CIT) of 0.0020 (0.2%) is <5% level of significance, the null hypothesis that company income tax has no significant impact on gross fixed capital formation in Nigeria is rejected.

4.10.2 Test of hypothesis two

HO2: There is no significant impact of petroleum profit tax on gross fixed capital formation in Nigeria

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GFCF(-3)	0.350546	0.126316	2.775142	0.0110
PPT	2.82E-07	1.29E-07	2.181129	0.0401

Source: Extracted from table 4.4

Since the p-value for petroleum profit tax (PPT) of 0.0401 (4%) is within the acceptable significance level of 5%, that is, < 5%, we reject the null hypothesis that there is no significant impact of petroleum profit tax on gross fixed capital formation in Nigeria.

4.10.3 Test of hypothesis three

H03: There is no significant impact of custom and excise duties on gross fixed capital formation in Nigeria

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GFCF(-3)	0.350546	0.126316	2.775142	0.0110
CED	-5.96E-05	1.63E-05	-3.660161	0.0014

Source: Extracted from table 4.4

Since the p-value for custom and excise duties (CED) of 0.0014 (0.14%) is within the acceptable significance level of 5%, that is, < 5%, we reject the null hypothesis that there is no significant impact of custom and excise duties on gross fixed capital formation in Nigeria.

4.11 Apriori economic expectation result

The result is evaluated based on economic theories and literatures inline with what is obtainable in Nigeria and what is applicable all over the world.

Table 4.11 Apriori Expectation

Variables	Expected Signs	Actual Signs	Remark
CIT	Positive (+)	Positive (+)	Conform
PPT	Positive (+)	Positive (+)	Conform
CED	Positive (+)	Negative (-)	Do not Conform

4.12 Discussion of findings

This study was carried out to investigate the impact of tax revenue on economic development of Nigeria. The result of data analysis suggests the following inferences: company income tax had a positive significant impact on gross fixed capital formation in Nigeria, while petroleum profit tax was observed to also have a positive and significant impact on gross fixed capital formation in Nigeria, these results also conformed to apriori expectations. However, customs and excise duties was observed to have a significant negative impact on gross fixed capital formation in Nigeria, this result however, did not conform to apriori expectations suggesting that government should reduce customs and excise duties which will in turn encourage importers to import more and also encourage domestic manufacturers to produce more and contribute towards economic development in Nigeria by increasing the volume of gross fixed capital formation in Nigeria. The findings of this study were in consonance with some past studies on this subject matter earlier reviewed, such as; Uzoka and Chiedu (2018) and Ihenyen and Ebipanipre (2014). The findings elicited from this study was however in negation of the studies like Asaolu, Olabisi, Akinbode and Alebiosu (2018), Abomaye, Williams, Samuel and Friday (2018) and Oshiobugie and Akpokerere (2019) who recorded insignificant impact of tax revenue on economic growth of Nigeria.

5. Conclusion and policy recommendations

5.1 Conclusion

The main objective of this study was to investigate the impact of tax revenue on economic development in Nigeria between 1981 and 2019. This study employed gross fixed capital formation as measure of economic development, while the various tax policies in Nigeria such as

company income tax, petroleum profit tax and custom and excise duties were employed as independent variables. The results of ARDL model revealed that company income tax and petroleum profit tax had significant positive impact on gross fixed capital formation in Nigeria, while customs and excise duties recorded a negative significant impact on gross fixed capital formation in Nigeria. If the government is serious about increasing economic development through increase in gross fixed capital formation, government should reduce customs and excise duties, this will in turn encourage importers to import more and also encourage local manufacturers to produce more and contribute to economic development in Nigeria by increasing the volume of gross fixed capital formation in Nigeria.

5.2 Policy recommendations

1. Government should be more serious with tax collection by rolling new tax reforms that would enhance the collection of company income tax and also ensure that those mechanisms put in place would check tax evasion and tax avoidance.
2. Since Nigeria is oils and gas dependent, the government should formulate adequate and thorough measures and reforms that would enhance the collection of petroleum profit tax. If petroleum profit tax is properly harnessed, economic development in Nigeria will be enhanced through the increase in gross fixed capital formation in Nigeria.
3. Government should reduce customs and excise duties which will in turn encourage importers to import more and also encourage domestic manufacturers to produce more and contribute towards economic development in Nigeria by increasing the volume of gross fixed capital formation in Nigeria.

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Data used for analysis

YEAR	GFCF	CIT	PPT	CED
1981	89.38105	403	6325.8	2325.8
1982	85.9339	550	4846.4	2336
1983	75.75313	561.5	3746.9	1984.1
1984	58.94738	787.2	4761.4	1616
1985	46.39088	1004.3	6711	2183.5
1986	54.95059	1102.5	4811	1728.2
1987	49.98771	1235.2	12504	3540.8
1988	43.64422	1550.8	6814.4	5672
1989	52.48869	1914.3	10598.1	5815.5
1990	53.12219	2997.3	26909	8640.9
1991	48.40018	3827.9	38615.9	11456.9
1992	43.77439	5417.2	51476.7	16054.8
1993	44.47636	9554.1	59207.6	15486.4
1994	42.06784	12274.8	42802.7	18294.6
1995	37.20593	21878.3	42857.9	37364
1996	36.62556	22000	76667	55000
1997	38.47746	26000	68574.1	63000
1998	40.61495	33300	680000	57700
1999	38.34181	46200	164300	87900
2000	34.10954	51100	525100	10150
2001	30.92589	68700	639200	170600
2002	27.58251	89100	392200	181400
2003	29.3868	11480	683500	195500
2004	27.11797	13300	1183500	217200
2005	24.99612	14030	1904900	232800
2006	26.16665	24490	2038300	177700
2007	20.18004	27530	1500600	241400
2008	18.85977	450000	2812300	281300
2009	21.11545	630100	1256500	297500
2010	16.81501	712000	1944700	309200
2011	16.36056	806000	30700000	438300

2012	14.95883	963200	32010000	438300
2013	14.90391	8270667	21551567	395267
2014	15.8027	3346622	28087189	423956
2015	15.4901	4193496	27216252	419174
2016	15.36674	1791408	4847390	661380
2017	15.47433	1704337	9103131	1800000
2018	19.80983	17766549	24456878	1786545
2019	19.98656	18766544	21765456	1878754

Source: Federal Inland Revenue quarterly publications and World Bank Data Base: World Developmental Indicators of 2019