

Two - Stage Least Square Estimation of Federal Government Collected Taxes and Economic Growth in Nigeria

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Abstract - The paper investigates the effect of exogeneity and multicollinearity in the estimation of federal government collected taxes and economic growth. Ordinary Least Square model of time series data are often associated with the above stated problem, of which previous attempts to model have failed to investigate. This study thus, explored these phenomena within the context of fitting an economic growth model via a Two-Stage Least Square technique (TSLS) by considering only federal government collected tax instruments as predictors. The validation of the model parameters were ascertained using t-test, F-test, Durbin Watson, R-squared, Adjusted R-squared and Standard error test while variance inflation factor and tolerance level were employed to estimate the degree of multicollinearity. The adopted validity statistic showed that the TSLS model was properly specified with the introduction of specified instrumental variables. The findings from the fitted model revealed that on the aggregates, taxation has contributed positively to the economic growth of Nigeria for the periods under review. In addition, F-statistic of 10.36757 with P-value of 0.000 shows that the overall TSLS regression model is statistically significant and free from the aforementioned problem. The research thus recommends a TSLS technique for the appropriate and error free modeling of economic growth whenever time series data is in used.

Keywords: Federal Government, Taxes, Economic Growth, Two-Stage Least Square, Nigeria.

I. INTRODUCTION

Individuals, groups, businesses and corporate bodies are caused to pay a certain amount or percentage of income as levy by constituted authorities for the provision of public goods, security, development and social benefit of the people. This levy is called tax. Taxes have come into reality of being from ancient time, without a certain mention of when precisely it developed, but the origin of tax can be traced to the ancient cities of Egypt, Greek and Rome (Uguru (2017); Abomaye-Nimenibo, Micheal & Friday, 2018). The major duty of every leader the world over is to provide safety, liberty, well-being, and comfort for its citizens (Ofoegbu, Akwu & Oliver, 2016). Section 16(1b) of the 1999 Constitution of the Federal Republic of Nigeria states that “the government has the responsibility of ensuring the maximum welfare, freedom and happiness of its citizens”. Also, the government duties toward their subjects have been on an increase daily, with much emphasis on the developing countries like Nigeria due to the increasing population and

technological advancement. To carry out this major function and other subsidiary duties adequately, every government requires adequate revenue. Unfortunately, the resources relied on by the government continue to dwindle from year to year (Ofoegbu *et al*, 2016).

Bhartia (2009) sees tax as a mandatory fee required from individuals and organizations to the administration without any corresponding utilitarian value expected. According to Ibanichuka, Akani & Ikebujo (2016), tax generates very valuable income to the government. The Institute of Chartered Accountants of Nigeria (2014) defines tax succinctly as a compulsory levy paid to government in line with relevant extant laws. tax is also a compulsory payment levied by the constituted authority on the income, profit or wealth of individuals, group of persons, and corporate entities (Ofoegbu *et al*, 2016). Taxation in summary is the transfer of income from the individual or corporate entities to the government so as to enable the public to carry out some, if not all, of the country’s economic and social objectives. The objectives may be in the form of provision of basic services regularly and particularly in the educational, health, transportation, amenities and capital formation (Abomaye-Nimenibo *et al*, 2018).

In Gwa & Kase (2018)’s view, economic growth signifies an extension in the worth of outputs and utilities manufactured by a nation for a given period of time and scholars make use of an expansion in nation’s Gross Domestic Product (GDP) to calculate it. Therefore, there is possibility of having economic expansion i.e. growth without necessarily having economic development over a short-run/ medium time period (Hadjimicheal, Kemeny & Lanahan, 2014). A conducive atmosphere must be provided by way of an investment of the nation’s earnings in expansion of basic facilities for ensuring successive advancement in the living standard of the citizens of a state (Wilkins & Zarawski, 2014). To calculate or estimate economic growth, scholars usually scrutinize or explore the worth in actual or real Gross Domestic Product (RGDP) within each year and another (Chigbu, 2014).

As much as government duties and functions persistently rise over time in Nigeria due to rise in population and technological advancement, but resources available from

oil as the only major source of revenue to Nigeria continue to decline on daily basis due to the drastically fall in the price of oil recently. This has caused decline in the standard of living of the populace in Nigeria as well; there has been difficulty having access to quality education, problem of access to improved healthcare delivery, non-availability of employment opportunities for the teeming population of the youth, no access to clean and healthy drinking water, and safety of life and properties, to mention but a few. The over dependence of the Nigerian economy on monolithic product (crude oil revenue) has a serious negative consequence on the economy if not checked as the economy faces a dangerous economic condition unless proactive measures are formulated in getting another source of revenue internally (Dickson and Rolle, 2014). The principal reason for tax is always to realize enough finances that will match government expenditure at the different tiers of governance. Saheed, Abarshi & Ejide (2014) opined that a tax network provides the greatest functional mechanism of rallying the nation's resources internally which helps in creating a useful conditions for the stimulation of economic growth in the nation.

It is noted that while many studies were before now carried out on the impact of tax revenue on economic growth, not much rigorous efforts have been made to separate State Government collected taxes from the Federal Government collected taxes in the model specification. Furthermore, most of these models employed Ordinary Least Square (OLS) model which has not been known to have the capacity to take care of the consequences of known collinear econometric variables of which Federal Government collected taxes used in this research are of no exceptions. The known consequences of such models are such that the estimator of such models will not be BLUE (Best Linear Unbiased Estimate). This tends to put an empirical question on the reliability of the estimates of those regression models. This study therefore attempted to address these problems by developing a Two-Stage Least Square Model (TSLSM) which is a known case of instrument variable regression whose estimates are not only consistent but reliable and which is capable of fully taking care of aforementioned challenges. This Two-Stage Least Square in view shall at first estimates an Ordinary Least Square (OLS) regression model while the next stage shall involved the fitting of the original equation with all the values replaced by the fitted values from the first stage regressions.

The main objective of this study therefore, is to estimate the impact of Federal Government collected taxes on economic growth in Nigeria while evaluating the usual associated multicollinearity and exogeneity problem with a view to generating an empirical model to provide guide for the review of tax regime in Nigeria. The study covers revenue realized through different types of taxes in Nigeria for the period 1999 through 2017. The choice is to determine the impact of above-mentioned taxes on economic growth of Nigeria since democratically elected government took over in 1999 through 2017.

II. LITERATURE REVIEW

A. Conceptual Review

1). *Taxes*: Chigbu, Akujiobi & Ebimobiwei (2012) opines that taxes are compulsory payments made by citizens and business entities to government for the provision of public goods, security of life, economic development and social amenities to the entire populace. Bhartia (2009) sees tax as a mandatory fee required from individuals and organizations to the administration without any corresponding utilitarian value expected. Appah (2004) defines tax as a mandatory fee payable by individuals or his possessions which the authority utilizes for provision of infrastructural facilities and state of prosperity for the environment generally. Therefore, taxation is a recognized means of any nation's regulatory framework for investment and economic growth (Abomaye-Nimenibo *et al*, 2018)

Ibanichuka *et al* (2016) stresses that there are several taxes that are collected federally such as follows; CIT, PPT, VAT, PIT, Customs and Excise Duties(CED), Capital Gains Tax (CGT) Stamp Duties (SD), and Withholding Tax (WHT) amongst others. The arm of central administration that is charged with the assessment and administration of taxes, apart from customs and excise duties is Federal Inland Revenue Service (FIRS). However, the Nigeria Customs Service is saddled with the responsibility of assessing and collection of customs and excise duties. Company Income Tax (CIT) is a kind of tax imposed on yearly basis on assessment currently payable at the rate of 30 kobo each ₦1(30%) upon the chargeable profits of any firm in Nigeria. Gatawa, Aliero & Aishatu (2016) view VAT as the tax on the value added. The value added of a production outfit is the variability between the aggregate earnings and its gross cost outlays on intermediaries within a reporting period. Hence, it is the aggregate of benefit a company subscribes to goods produced or services rendered through application of the outfit's resources such as management, machines, materials, and money (i.e. the 4Ms) also classified as land, labour, capital, and entrepreneurship (Gatawa *et al*, 2016). Petroleum Profit Tax has been defined as "a legislation which imposes tax upon profits from the mining of petroleum in Nigeria and provides for the assessment and collection thereof and for the purposes connected therewith" (Yahaya & Bakare, 2018). Customs and Excise Duty is a tax imposed on goods sourced from abroad (and occasionally on goods send abroad) by the customs agents establishment or officials of a nation to generate income for the country and/or to safeguard local firms from hyper- efficient or competent rivals from overseas (Ibadin & Oladipupo, 2015). Customs duty is calculated mostly on the worth of goods or on the mass/tonnage, size or volume, or some other basis or yardsticks that can be resolved by the nation. They are levied or imposed either as a proportion or ratio of the worth of goods coming from abroad or a permanent or stable sum on certain amount (Fasoranti, 2013).

Company Income Tax (CIT): According to Adereti, Sanni & Adesina (2011) as cited in Nwaiwu & Macgregor (2018), Company Income Tax (CIT) is a form of tax on a company's total profit at the rate of 30%. The tax was introduced in 1961 and administered by FIRS. The contribution of the company income tax to the economy of Nigeria cannot be over-emphasized.

Value Added Tax (VAT): Value Added Tax is a tax on conspicuous consumption, which the burden is borne by the end user but gathered at every phase or level of manufacturing and allocation (Omodero, Okafor, Azubuike & Ekwe, 2016). Authority believed that VAT is not possible to dodge or escape. In Nigeria, as stressed further by Omodero *et al* (2016), the programmes concerning the VAT system started with 1992 budget speech by General Ibrahim Badamosi Babangida, the then Head of State. According to them, the commencement or inauguration of VAT in 1993 symbolizes the phase down of the sales tax which was introduced in 1986. VAT was first adopted by France in 1954 to replace the turnover tax (i.e. a tax imposed on the gross monetary value of a product at each stage of the product process. Since 1967, members of European Economic Council (EEC) have also adopted the VAT as a kind of tax that generates revenue (Abomaye-Nimenibo *et al*, 2018).

Petroleum Profit Tax (PPT): Petroleum Profit Tax is defined as a tax imposed upon profits from the mining and exploration of petroleum in Nigeria (Yahaya & Bakare, 2018). The rates of Petroleum Profit Tax based on level of petroleum operations are 85% for exports, 65.75% for domestic sales. According to Ihendinihu, Ebiri & Emmanuel (2014), petroleum profits tax is supported with two distinct contractual relationships under the Joint Operating Agreement and the Production Sharing Contract not officially provided for by tax legislation. In the view of Usman & Adegbite (2015), the profits of a business entity under the Act, as it relates to the accounting period are the total of the income of sale of all chargeable oil, natural gas during the period of consideration.

Customs and Excise Duties: Customs and excise duties are the totality of import and export duties collected by the customs and excise department. Excise taxes are charges imposed by government on specific commodities produced in a country at differing rates. These charges are being imposed on domestic products produced locally as distinct from imported goods and are mainly imposed for revenue generation purposes, they further submitted.

2. Economic Growth: The International Monetary Fund (2009) and CBN (2010) describe economic growth as the expansion or growing in the aggregate or volume of conspicuous consumption manufactured in the nation's economy or in a financial system over a period of time. According to them it is commonly computed as the ratio or proportion of expansion in actual aggregate or total national output, and growth or expansion is calculated in actual or genuine word i.e. inflation- regulated/modified expression so

as to remove the impact of inflation on the estimation or valuation of goods/products and utilities manufactured. In Gwa & Kase (2018)'s view, economic growth signifies an extension in the worth of outputs and utilities manufactured by a nation over a given time period and scholars use an expansion in nation's Gross Domestic Product (GDP) to calculate it. Therefore, there is possibility of having economic expansion i.e. growth without necessarily having economic growth in not too long a period of time (Hadjimicheal, Kemeny & Lanahan, 2014). This means that there could be a rise in Gross Domestic Product (GDP) without a corresponding rise in the social and economic conditions of living of people in a country, they further stated.

To calculate or estimate economic growth, scholars usually scrutinize or explore the worth in actual or real Gross Domestic Product (RGDP) from a year to another (Chigbu, 2014). Economic growth can be represented with different proxies using various economic parameters. Meanwhile, for the purpose of this paper, economic growth is proxies using Gross Domestic Product (GDP) between periods 1999 through 2017.

B. Empirical Review

Adeyemo, Fakile, Obigbemi & Ben-Caleb (2017) investigated the level of effectiveness of the system of Value Added Tax administration (VAT) in Nigeria and the advantages implicit in adopting VAT and its effect on economic growth for the period 1994 to 2014. Data was collected from Central Bank of Nigeria Statistical Bulletin and other relevant agencies and analyzed using multiple regression model and the results revealed that there is no significant relationship between Value Added Tax and economic growth. Though, there is a significant relationship between Value Added Tax, the total earnings created in Nigeria but VAT structure in Nigeria is only effective but not efficient. The study therefore recommended that the government should raise the rate of Value Added Tax for luxury.

Ogbuma (2017) examines value added tax and economic growth in Nigeria using time series survey data that spanned a period of 20 years (1994 to 2013) that was collected from Central Bank of Nigeria statistical bulletin and Federal Inland Revenue Service. Data collected was analyzed using Ordinary Least Square Linear Regression and the study found that VAT is statistically significant, which suggests that VAT has positive relationship with economic growth in Nigeria. It was recommended that the federal government should improve on the administration of the Value Added Tax system for an enhance performance and raise the current VAT rate of 5% to 10% to be abreast with what is obtainable in other countries.

Yahaya & Bakare (2018) investigated the effect of Company Income Tax and Petroleum Profit Tax on economic growth of Nigeria using data collected for the taxes from 1981 to 2014. Fully Modified Least Square Regression Approach

was adopted in analyzing the data collected for a period of 34 years and the results showed that Company Income Tax and Petroleum Profit Tax have impacted positively on Gross Domestic Product (used to proxy economic growth) of Nigeria. The study therefore concluded that Company Income Tax and Petroleum Profit Tax should be seen as the main source of revenue to the growth of Nigerian economy and it was recommended that authority should be transparent and prudently account for the income generated from Petroleum Profit Tax by improving upon provision of social amenities.

Nwaiwu & Macgregor (2018) evaluated the effect and relationship between collectible tax revenue and economic growth in Nigeria for forty (40) years period (1975 to 2015) using the Pearson Product Moment correlation coefficient and Multiple Linear Regression analysis on time series (secondary) data collected. The findings revealed the anecdotal evidence of poor resource governance architecture that has for so long characterized Nigeria's industry as well as its macroeconomic policies and management and the study recommended that all tax revenue should be collected through online gateways to the government accounts.

Abomaye-Nimenibo, Micheal & Friday (2018) examined the tax revenue contributions to economic growth in Nigeria from 1980 to 2015 using Ordinary Least Square (OLS) as the main analytical technique on the secondary data collected within the periods under review. The results confirmed that there was a long-run relationship among the variables while the short-run regression result revealed that Petroleum Profit Tax (PPT) and Company Income Tax (CIT) have no significant relationship with economic growth in Nigeria and the study recommended that government should ensure that tax revenue is used judiciously in the provision of social amenities like good education, housing, good transportation network, qualitative health care service, steady power supply, good road network that will enhance economic growth and development in the country.

Gwa & Kase (2018) examined the contribution of tax revenue on the economic growth of Nigeria using secondary data sourced through Central Bank of Nigeria statistical Bulletin and Federal Inland Revenue Service for the periods of 1997 to 2016. The Ordinary Least Square of Multiple Regression models was employed to determine the contribution of variables and the findings showed that there is a significant contribution of Company Income Tax (CIT) and Value Added Tax (VAT) on the economic growth of Nigeria. The results also indicated that Petroleum Profit Tax has not contributed significantly to the economic growth of Nigeria for the period of the study and the study therefore recommended that the agencies in charge of Petroleum Profit Tax (PPT) should be fortified further to implement obedience by various taxpayers in order to generate additional tax income for the authority to move the administration.

C. Theoretical Framework

The underpinning theory for this study is the optimal theory of taxation. The optimal theory of taxation according to Ramsey (1927) postulates that a tax structure should be preferred to exploit a public welfare function based on a set of limitations. The literature on optimal taxation of course considers the social planner as a serviceable, that is, the public welfare role is based on the services of people in the society. It is position of the theory that public worker's goal is to make alternative in the tax system that optimizes the consumer's welfare, with the knowledge that the consumer will react to any incentives provided by the tax system. After establishing a target role, the next step is to define the limitations that the social worker encounters in putting up a tax structure. Markiny, Weinziel & Danny (2014) stated further that Ramsey (1927) was of the opinion for a one line of attack, assuming the planner can only raise a specified level of tax revenue via taxes on commodities

Meanwhile, the public worker has to think of all necessary tax strategies which may include irregular and connected taxes on goods, income and non-economic personal characteristics. However, when the public worker is permitted to be immoral in selecting a tax system, the associated bottlenecks of optimal taxation will become solved; the optimal tax is in a simple term, a sum total tax and it achieves precisely what the public worker wants. However, the public worker must face the battle with multiplicity or variety in taxpayers' willingness and ability to pay. According to Adegbe, Jayeoba & Kwabai (2016), if the worker perhaps notices discrimination among taxpayers in intrinsic or basic ability, the worker will then depend on aggregate amount or taxes but this time around those aggregate amount or taxes would be conditional on ability or capacity.

III. METHODOLOGY

A. Research Design

The study adopted the *ex post facto* research design. The design was considered most appropriate for this study because the events have occurred and it is not possible for the researcher to directly manipulate or control any of the independent variables.

B. Sources of data

Time series data for independent variables and dependent variables were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin (various issues) for the periods under consideration, analysis carried out and conclusion was drawn accordingly.

C. Model Specification

The econometric model specified for this research is given as

$$GDP = f(CIT, VAT, PPT, CED) + \varepsilon \dots (1)$$

When this model is written explicitly, it becomes

$$GDP = \beta_0 + \beta_1 CIT + \beta_2 VAT + \beta_3 PPT + \beta_4 CED + \varepsilon \dots \quad (2)$$

The instrumental variables specified for this model are CIT, CIT (-), VAT and PPT.

Where GDP is gross domestic product, CIT is company income tax, VAT is value added tax, PPT is petroleum profit tax, CED is customs and exercise duties and CIT (-) is lagged of CIT. GDP is excluded from the list of instruments since it is an endogenous variable and thus correlated with the residuals.

D. Analytical Tools

The analytical technique that was employed in this research is Two-stage Least Squares (TSLS). A principal assumption of regression analysis is that the independent variables are uncorrelated with the stochastic term and with one another. Whenever this assumption is violated, Ordinary Least Square (OLS) is biased and inconsistent. There exist a number of circumstances where some of the independent variables were correlated with disturbances; and since one of the variables considered in this research (i.e. CIT) is not exempted from these situations, we considered a two-stage least squares technique appropriate to give us a best, linear unbiased estimates. These variables that correlated with residuals are referred to as endogenous, and the standard approach in this case is to specify the equation using instrumental variables regression.

Two-stage least squares (TSLS) is seen as a special variant of instrumental variables regression. According to its name, two clear-cut stages will be passed through in two-stage least squares. In the first stage, TSLS locates the parts of the endogenous and exogenous variables that can be traced to the instruments under study. This stage entails determining an OLS regression of individual variable in the equation on the set of instruments. The next stage is a regression of the original model equation, with most of the variables changed by the fitted values from the previous stage regressions.

To achieve this purpose, we used Econometric Views to estimate the two stages simultaneously through the use of instrumental variable techniques. Let us take Z to be the matrix of instruments, and y and X to be the dependent and explanatory variables. Hence the coefficients calculated in two-stage least squares are as shown in Equation 3 below:

$$b_{TSLS} = (X'Z(Z'Z)^{-1}Z'X)^{-1}X'Z(Z'Z)^{-1}Z'y \dots \quad (3)$$

Therefore, the estimated covariance matrix of these coefficients becomes

$$\hat{\Sigma}_{TSLS} = s^2(X'Z(Z'Z)^{-1}Z'X)^{-1} \dots \quad (4)$$

Where s^2 is the estimated residual variance (square of the standard error of the regression).

IV. RESULTS AND DISCUSSIONS

TABLE I

ORDINARY LEAST SQUARE RESULT

(Dependent variable = RGDP, Instruments specifications: CIT, D(CIT), PPT and VAT)

Variable	Coefficient	Std. Error	t-Statistic	P-value
C	16843.01	5871.324	2.8687	0.0124
CED	0.034811	0.022451	1,550550	0.1433
CIT	-0.015976	0.064568	-0.247424	0.8082
PPT	-0.001094	0.000335	-3.2669	0.0056
VAT	0.085	0.096952	0.8811	0.3931

R= 0.934 R-squared = 0.873025 Adj. R-squared = 0.836747

Durbin Watson = 1.4526 F-Statistic= 24.06456 Prob. (F-statistic) = 0.000004 Tolerance Level = β_1 (0.005), β_2 (0.268), β_3 (0.007), β_4 (0.118)
VIF = β_1 (190.914), β_2 (03.731), β_3 (134.086), β_4 (8.466)

Substituting the coefficients of table 1 into equation 2, we have;

$$RGDP = 16843.01 + 0.034811CED - 0.034811CIT - 0.001094PPT + 0.085VAT \dots (5)$$

TABLE 2

TWO STAGE LEAST SQUARE RESULT

(Dependent variable = RGDP, Instruments specifications: CIT, D(CIT), PPT and VAT)

Variable	Coefficient	Std. Error	t-Statistic	P-value
C	22660.77	10612.73	2.135244	0.0023
CED	0.125503	0.059659	2.103674	0.0154
CIT	0.089137	0.118421	0.752711	0.0250
PPT	-0.000680	0.000573	-1.188291	0.2560
VAT	-0.134844	0.196746	-0.685368	0.5052

R-squared = 0.704871 Adj. R-squared = 0.614061 J-statistic = 0.00000

F-Statistic = 10.36757 Prob(F-statistic) = 0.000

Instrument rank = 5 (constant inclusive)

Substituting the coefficients of table 2 into equation 2, we have

$$RGDP = \frac{22660.77}{(10612.73)} + \frac{0.125503}{(0.059659)}CED + \frac{0.089137}{(0.118421)}CIT - \frac{0.000680}{(0.000573)}PPT - \frac{0.234844}{(0.196746)}VAT \quad (6)$$

Equation (5) represents the empirical model fitted by using Ordinary Least Square technique. Values of regression constant β_2 (CIT) and β_3 (PPT) are negatives, which normally supposed to be positive as a result of the underpinning econometric principles of the specified model. Also, three of the four explanatory variables employed were found to be

insignificant based on their t-statistic values with corresponding high standard errors; and these have been due to the perceived existence of multi-collinearity (Neter, Wasserman & Kutner, 1989). These perceived problem may also have been due to the violation of Exogeneity assumptions where some or all of the explanatory variables are exogenous (i. e. having relationship with the residual terms in the model). The coefficient of determination otherwise known as shared variance (R^2) vividly indicates a value on the high side (87.30%) and also the correlation coefficient of 0.934 that also depicts a very high degree of multicollinearity among the independent variables. Though, the Durbin-Watson value of 1.4526 implies that the model was properly estimated while the significant value of F-statistic, which is an indication of model overall goodness of fit shows a high level of significant; this indicates that Multicollinearity did not show the real result as it affects the significance of the regression coefficients, which looks too good to be real. Furthermore, the Tolerance levels of 0.005, 0.268, 0.007 and 0.118 for β_1 , β_2 , β_3 and β_4 respectively, vividly indicated a very low tolerance level among all the independent variables with very high corresponding Variance Inflation Factors (VIF) of 190.914, 3.731, 134.086 and 8.466 respectively,

In multiple regressions, tolerance and VIF are jointly used as indicators of multicollinearity. Tolerance is estimated by $1 - R^2$ while VIF is defined as the reciprocal of tolerance. Researchers expects greater levels of tolerance, because low levels have been noted to negatively affect the outcome associated with a multiple regression analyses while lower levels of VIF are usually desired. In fact, VIF of over 2.50 shows comparatively high levels of multicollinearity. Based on the above submission, it thus becomes pertinent to seek for an advanced OLS technique in the name of Two-Stage Least Square (TSLS) that will be capable of giving this research, a model whose estimates are not only consistent but reliable and which is capable of fully taken care of the aforementioned consequences.

Table 2 indicates the Two-stage Least Squares estimates of RGDP (dependent variable) and explanatory variables of CED, CIT, PPT and VAT. The implication of econometric model specified as equation (2) is that holding all the predictor variables constant, the Real gross domestic product of Nigeria will experience a constant growth of ₦2,266,770,000,000 (two trillion, two hundred and twenty six billion, seven hundred and seventy million). However, only the explanatory variables of CED and CIT have impacted positively on economic growth while the other two exhibited a negative relationship. This is an attestation to the strong influence of non-oil revenue on the growth of Nigerian economy as it is presently been influenced by the strong contributions of CED and CIT. That is, any unit increase in Custom exercise duties and Company income tax will bring about ₦125,503,000 and ₦89,137,000 increases respectively to the nation's GDP while the duo of Petroleum profit tax and Value added tax will only bring about meagre reductions of

₦680,000 and ₦134,844,000 respectively. Thus on the aggregates, taxation has made a positive contribution to the economic growth of Nigeria for the periods under review.

The R-square of 0.704871 showed that about 70.5% variation in Real Gross Domestic Product (RGDP) could be largely explained by variation in the adopted taxes while the remaining 29.5% is due to other factors equally responsible for economic growth in Nigeria but not considered in this research. The adjusted R^2 of 0.614061 indicates that about 61.4% of the predictors' variables can be explained when other regressors are added to the TSLS model as it reveals the validity of the coefficient of multiple determinations R^2 of 0.704871. The Durbin Watson statistic measures the exigencies of serial correlation among the variables. The result of the Durbin Watson test gives 0.8456 and since this value lies between -2 and 2, it is confirmed that there is no autocorrelation among the successive values of the variables in the model; hence the model has been correctly specified with the introduction of instrumental variables specified.

In addition, F-statistic 10.36757 with P-value of 0.000 shows that the overall TSLS regression model is statistically significant and the model fitted has provided a good fit since the P-value = 0.000 is less than $\alpha = 0.05$ level of significance. Therefore, the four (4) predictors' variables jointly account for the variation in economic growth (RGDP) which also contributes to the rejection of H_0 that the model is inadequate for the research study. This can be evidenced since there exist overall significant relationship between the selected inputs of economic growth and GDP.

V. CONCLUSION AND RECOMMENDATIONS

The findings from the fitted model showed that on the aggregates, taxation has positively contributed to the economic growth of Nigeria for the periods under review. In addition, F-statistic of 10.36757 with P-value of 0.000 shows that the overall TSLS regression model is statistically significant and the model fitted has provided a good fit. In line with results obtained, it could be deduced that tax collection by federal government need to be focused on, improve upon and concerted efforts should be made to increase revenue collection from taxes by the federal government to augment the dwindling resources from a mono-economy source (oil revenue) in order to impact positively on Nigerian economic growth and development. Thus, the superiority of the TSLS model compared to that of OLS is an attestation to the fact that the aforementioned problem of exogeneity and multicollinearity have been adequately taken care of within the context of this research. The research thus recommends a TSLS technique for the appropriate and error free modeling of economic growth whenever time series data is in used.

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