

# A Causal and Long-run Nexus Between Value Added Tax and Economic Growth of Nigeria (1994-2017)

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**Abstract:** This study empirically examined the causal and long-run relationships between taxation and economic growth of Nigeria. It spanned from 1994 to 2017 and utilized annual time series secondary data extracted from the Central Bank of Nigeria (CBN) statistical bulletin (2017) edition. Ex-post facto research design was adopted while the Vector Autoregressive (VAR) method of Pairwise Granger Causality test and Vector Error Correction Mechanism (VECM) were employed. Findings revealed a significant long-run and short-run influence of VAT and revenue on Nigerian Gross Domestic Product (GDP). However, the Granger causality test result showed that growth in GDP drives VAT and revenue growth in Nigeria without a feedback. This implies that taxes and tax revenue are substantial for the sustainable growth of Nigerian economy. However, if more goods and services are taxed, the revenue base of the country will increase. Based on these findings, it was recommended among other that the monoprodukt economy of Nigeria should be diversified along the line of taxation since there exists a directional relationship between taxation and economic growth in Nigeria. Individuals and organizations should pay up their taxes while revenue generated from these taxes should be appropriately utilized for the good of citizens and as well growth of the economy.

**Keywords:** Taxation, Economic Growth, Revenue, Vector Error Correction, Granger Causality

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## 1. Introduction

Taxation is a compulsory condition for withdrawal of resources from the private sector of the economy to the public sector. According to Anyanwu (2013) and Matthew (2014), taxation is the compulsory transfer of payment (or occasionally of goods and services) from private individuals, institutions or groups to the government [1, 2]. It is a compulsory contribution imposed by a public authority, irrespective of the exact amount of service rendered to the taxpayer in return, or a compulsory contribution from a person to the government to defray the expenses incurred in the common interest of all, without references to special benefits conferred. According to Appah (2010), taxation is a compulsory levy imposed on a subject or upon his property by the government to provide security, social amenities and create conditions for the economic well-being of the society [3].

The value added tax is a type of tax in Nigeria. The Value

added tax (VAT) is a consumption tax, levied at each stage of the consumption chain and borne by the final consumer of the product or service [4]. It is a consumption tax payable on the goods and service consumed by any person, whether government agencies, business organizations or individuals. Accordingly to Igweonyia (2011), Value Added Tax (VAT) in Nigeria is a Federal government tax, which is administered using the existing machinery of the Federal Inland Revenue Services (FIRS) [5]. The target of VAT is consumption of goods and services and unless an item is specifically exempted by law, the consumer is liable to the tax.

The value added tax is levied at the rate of 5%. The administration of VAT is relatively easy, unselective and difficult to evade. Countries all over the world look for ways to boost their revenue. This facilitated many nations including Nigeria to introduce value added tax on goods and services. Moreover, evidence suggests that VAT has become an important contributor to government revenue [6]. In Nigeria, value added tax (VAT) was introduced in 1993 but,

its full implementation began on 1st January, 1994.

VAT revenue is generated for distribution to the state and local government in Nigeria; which helps to reduce over dependence on oil revenue that assures a sustainable economic growth and development. While the performance of VAT as a

source of revenue in Nigeria is encouraging, Manukaji and Nwadiakor (2016) observed that its contribution to the growth of the economy has attracted the attention of both researchers and academia [7]. The succeeding sections of the paper are organized as shown in the figure below:

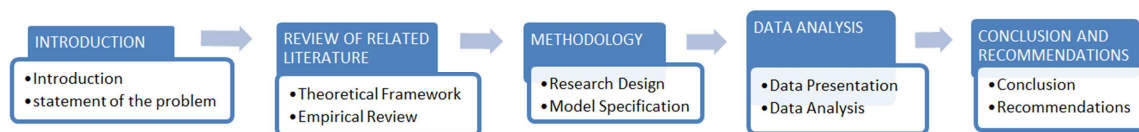


Figure 1. Outline of the Study.

### 1.1. Statement of the Problem

Tax is one of the major sources of government revenue but, not every government effectively exploits this opportunity as a means of revenue generation. Azubike (2009) posits that tax is a major player in every society of the world [8]. It is an opportunity for government to generate additional revenue to discharge its pressing obligations. Also, it is one of the effective means of mobilizing a country's internal resources so as to promote economic growth.

In Nigeria, value added tax (VAT) is one of the instruments the federal government introduced to generate additional revenue. Yet, most prominent Nigerians and interest groups had spoken against its introduction [9]. More so, Odusola (2006) noted that the Nigerian tax system is concentrated on petroleum and trade taxes while direct and broad-based indirect taxes like the value-added (VAT) are neglected [10]. Taiwo (2008) as cited in Ekeocha, Malolu, and Onyema (2012), observed that the distribution of government revenue is skewed in favour of oil revenue vis-à-vis non-oil revenue; non-tax revenue vis-à-vis tax revenue; and within the tax structure, indirect taxes vis-à-vis direct taxes [11, 12].

Consequent upon these, it appeared that VAT is fraught with some problems. Hence, this study is intended to examine the implication of VAT on revenue generation in Nigeria and how VAT affects the economic growth in Nigeria for the periods 1994-2017 with a view to contributing to existing literature.

### 1.2. Theoretical Review

This research model was underpinned by the Ibn Khaldun's theory of taxation (Benefit Theory of Taxation) which seeks to achieve the optimal tax rate. This benefit approach was initially developed by Knut Wicksell (1896) and Erik Lindahl (1919), two economists of the Stockholm School. It states that taxes be paid for public-goods expenditures on a politically-revealed willingness to pay for the benefits received [13, 14]. The principle is sometimes likened to the function of prices in allocating private goods. In its use for assessing the efficiency of taxes and appraising fiscal policy, this theory states that taxes should be levied on individuals according to benefit conferred on them. This means that, the more benefits a person derives from the activities of the state, the more he/she should pay to the government. This theory seeks to ensure that each

individual's tax obligations are as far as possible based on the benefits that he or she receives from the enjoyment of public services. The application of this theory is such that there are various taxes (levies) that are collected in the local jurisdictions. However, this theory faces various critics such as; Firstly, if the state maintains a certain connection between the benefits conferred and the benefits derived, it will be against the basic principle of the tax. A tax, as known, is compulsory contribution made to the public authorities to meet the expenses of the government and the provisions of general benefit. There is no direct quid pro quo in the case of a tax. Secondly, most of the expenditure incurred by the state is for the general benefit of its citizens. It is not possible to estimate the benefit enjoyed by a particular individual every year.

### 1.3. Review of Empirical Literature

Nmesirionye, Jones, and Onuche (2019) provided empirical analysis of the impact of fiscal policy on economic growth in Nigeria using annual time series data from 1986 to 2010 [4]. The study employed ordinary least square (log-linearized) method of multivariate regression analysis the log-linearized Model. The Augmented Dickey-Fuller unit root test was employed to establish the stationarity of the variables while the General-to-Specific approach to Autoregressive Distributed Lag (ARDL) model was used for testing for the existence of long-run and short-run equilibrium conditions. Result showed evidence of long run equilibrium relationship between fiscal policy and economic growth in Nigeria. Particularly, government's recurrent and capital expenditure have significant and positive impact on economic growth in Nigeria while non-oil taxes and government total debts have no significant impact on real GDP in Nigeria. Only capital expenditure has short run equilibrium relationship with economic growth.

Umeora (2013) investigated the effects of Value Added Tax (VAT) on economic growth (GDP) and total tax revenue in Nigeria for the periods of 1994-2010 [15]. Simple Linear Regression method was used while the result showed that VAT has significant effect on GDP and also on total tax revenue in Nigeria. The government is encouraged to sensitize the people to enable it increase the tax rate so as to enlarge its annual revenue for economic development.

Okoye and Gbegi (2013) evaluated the influence of revenue generated through Value Added Tax (VAT) on wealth

creation in Nigeria [16]. In an effort to accomplish this objective, secondary data were generated from Federal Bureau for Statistics which were analyzed with the aid of table and simple percentages while the hypotheses formulated were tested using Product Moment Correlation Coefficient and Student T-test. The findings revealed that revenue generated through VAT has a significant effort on total tax revenue in Nigeria.

Ojong, Anthony and Arikpo (2016) examined the impact of tax revenue on the Nigerian economy. Data were sourced from Central Bank Statistical Bulletin and extracted through desk survey method. Ordinary least square of multiple regression models was used to establish the relationship between dependent and independent variables [17]. The finding revealed that there is a significant relationship between petroleum profit tax and the growth of the Nigeria economy. It showed that there is a significant relationship between non-oil revenue and the growth of the Nigeria economy. The finding also revealed that there is no significant relationship between company income tax and the growth of the Nigeria economy.

Okafor (2012) investigated the impact of income tax revenue on the economic growth of Nigeria as proxied by the gross domestic product (GDP) [18]. The study adopted the ordinary least square (OLS) regression analysis technique to explore the relationship between the GDP (the dependent variable) and a set of federal government income tax revenue heads over the period 1981-2007. The regression result indicated a very positive and significant relationship between the components of tax revenue and the growth of the Nigeria economy.

Adereti, Sanni and Adesina (2011) studied value added tax and economic growth in Nigeria [19]. Time series data on the Gross Domestic Product (GDP), VAT Revenue, Total Tax Revenue and Total (Federal Government) Revenue from 1994 to 2008 sourced from Central Bank of Nigeria (CBN) were analyzed, using both simple regression analysis and descriptive statistical method. Findings showed that the ratio of VAT Revenue to GDP averaged 1.3% compared to 4.5% in Indonesia, though VAT Revenue accounts for as much as 95% significant variations in GDP in Nigeria. A positive and significant correlation exists between VAT Revenue and GDP. Both economic variables fluctuated greatly over the period though VAT Revenue was more stable. No causality exists between the GDP and VAT Revenue, but a lag period of two years exists.

Akwe (2014) analysed the impact of Non-oil Tax Revenue on Economic Growth from 1993 to 2012 in Nigeria [20]. To achieve this research objective, relevant secondary data were used from the 2012 Statistical Bulletin of the Central Bank of Nigeria (CBN). These data were analyzed using the Ordinary Least Squares Regression. The result from the test showed that there exists a positive impact of Non-oil Tax Revenue on economic Growth in Nigeria.

Omolapo, Aworemi, and Ajala (2013) examined the impact of value added tax on revenue generation in Nigeria [9]. The Secondary Source of data was sought from Central Bank of

Nigeria statistical Bulleting (2010), Federal Inland Revenue Service Annual Reports and Chartered Institute of Taxation of Nigeria Journal. Data analysis was performed with the use of stepwise regression analysis. Findings showed that Value Added Tax has statistically significant effect on revenue generation in Nigeria.

Ebimobowei and Ogbonna (2012) investigated the impact of petroleum profit tax on the economic growth of Nigeria. To achieve the objective of the study, relevant secondary data were collected from the Central Bank of Nigeria (CBN) and the Federal Inland Revenue Service (FIRS) from 1970 to 2010. The secondary data collected from the relevant government agencies in Nigeria were analyzed with relevant econometric tests of Breusch-Godfrey Serial Correlation LM, White Heteroskedasticity, Ramsey RESET, Jarque-Bera, Johansen Co-integration and Granger Causality. The results showed that there exists a long run equilibrium relationship between economic growth and petroleum profit tax. It was also found that petroleum profit tax does granger cause gross domestic product of Nigeria [21].

Gylych, Samira and Abdurrahman (2016) examined the impact of tax reforms on the economic growth of Nigeria from 1986 to 2012. To achieve the objective of the study, relevant secondary data were collected from Central Bank of Nigeria publications, Federal Inland Revenue Service publications and the publications of Federal office of statistics, text book, published and unpublished thesis. Analytical tool used was Ordinary least square (OLS) regression technique. Findings revealed that tax reforms is positively and significantly related to economic growth and that tax reforms indeed causes economic growth. On the basis of the findings, the study concluded that favorable tax reforms improves the revenue generating capacity of government to undertake socially desirable activities that will translate to economic growth in real output and per capita basis [22].

Izedonmi and Okunbor (2014) examined the contribution of VAT to the development of the Nigerian economy. Time series data on the Gross Domestic Product (GDP), VAT Revenue, Total Tax Revenue and Total (Federal Government) Revenue from 1994 to 2010 sourced from Central Bank of Nigeria (CBN) were analyzed, using both simple regression analysis and descriptive statistical method. Findings showed that VAT Revenue accounts and total revenue account for as much as 92% significant variations in GDP in Nigeria [23]. A positive and insignificant correlation exists between VAT Revenue and GDP. Both economic variables fluctuated greatly over the period though VAT Revenue was more stable.

Onyele and Nwokoacha (2016) examined the various sources of public funds and their resultant effect on economic growth in Nigeria from 1986-2014. The sources of public funds considered in this study were tax revenue, oil revenue, external debt and national savings. The times series data sourced from Central Bank of Nigeria Statistical Bulletin were analyzed using unit root tests, cointegration tests and vector error correction mechanism (VECM). The unit root test revealed that all the variables were stationary at first difference except tax revenue which was

significant at level. The cointegration tests (both Johansen and Engle-Granger) showed that a long run relationship existed between the individual sources of public funds and economic growth, as well as aggregate government revenue and economic growth. The result showed that tax revenue and oil revenue had a positive effect on economic growth, while national savings and external debt exerted a negative effect on economic growth. With respect to total government revenue, economic growth depleted as a result of changes in total government revenue [24].

Adeniyi (2012) evaluated the effect of tax administration on revenue generation to the Enugu state government. The studied incorporated both primary and secondary data which was analyzed using simple percentages and hypothesis tested using chi – square statistical method at 0.05 level of significant for validity and to make decisions. From the findings, there was rampant incidence of tax evasion and avoidance in Enugu state due to inadequate, ineffective and inefficient tax administration. The researcher concluded among other things that the apathy of Enugu state people towards payment of tax be checked by involving them in the decision making of tax administration, collection and utilization of the tax revenue [25].

Ayuba (2014) analyzed the impact of tax revenue on economic growth using times series data from 1993 to 2012. The dataset extracted from secondary sources were analyzed using the ordinary least squares approach. From the results, it was discovered that tax revenue exerted a positive impact on economic growth in Nigeria. It was thus recommended inter alia that efforts should be intensified by government at all levels towards increased collection of non-oil taxes [26].

Ayinde, Kuranga and Lukman (2015) investigated the impact of capital expenditure, recurrent expenditure and various sources of Government revenue on Nigeria's economic growth using secondary data gathered from Central Bank of Nigeria's publication from 1981 to 2011. The long-run relationship of economic growth (Gross Domestic Product (GDP) on capital expenditure, recurrent expenditure, oil revenue, nonoil revenue, federation account and federal retained revenue revealed the existence of co-integration. The results from the analysis showed a positive impact of capital expenditure, oil revenue, federation account and federal retained revenue on economic growth [27].

Okwara and Amori (2017) examined the impact of tax revenue on the economic growth in Nigeria for the period of 1994-2015. Secondary data were used and sourced from journals, textbooks and Central Bank of Nigeria (CBN) statistical bulletin. The variables considered were: Gross Domestic Product (GDP) as a proxy for economic growth, Value Added Tax (VAT), and non-oil income (tax). However, Ordinary Least Square (OLS) regression analysis technique was employed to test the significant impact of value added tax and non-oil income on Gross Domestic Product (GDP). The results revealed that non-oil income has significant impact on gross domestic product while value added tax has negative and statistically insignificant relationship with GDP for the period under review [28].

Manukaji and Nwadiolor (2016) investigated the impact of

value added tax on the economic growth of Nigeria from 2005-2014. Data were collected from Central Bank of Nigeria (CBN) statistical bulletin. A simple linear regression technique, with the aid of SPSS version 23.0, was employed to test the hypotheses formulated. The result showed that VAT positively contributes to the total revenue generated by government and by extension the economic growth of Nigeria. Therefore, this study recommends that revenue collected from VAT needed to be boosted. This can be achieved not necessarily by increasing the VAT rate of 5% percent but by closing every VAT revenue leakage, sensitizing the managers of companies operating in Nigeria on the need to remit the VAT revenue collection and proper training of the Federal Inland Revenue staff in charge of VAT revenue collection [7].

Branimir, Ivan, Milos, Jelena and Nada (2017) examined the relevance of nexus between tax reforms and economic growth and how they affect gross domestic product in Serbia for the period of 2006-2015. The impact is manifested through the analysis of three main tax forms: personal income tax (PIT), corporate income tax (CIT) and value-added tax (VAT) and their effect on the macroeconomic indicator as gross domestic product (GDP). The analysis covered the period of ten years in Serbia, while the regression model was constructed so that the GDP is defined as the dependent variable, while the tax forms are set as independent variables. To ensure correctly specified regression model, authors used the next test: VIF test, BP and BPG test, as well as Ramsey reset test. Results showed a high degree of positive correlation between the observed variables and the positive impact of the personal income tax, corporate income tax and value-added tax on the gross domestic product, but it is only the impact of value added tax that was statistically significant [29].

Nwadiolor and Ekezie (2016) examined the effect of tax policy on Economic Growth in Nigeria. The study uses annual time serial data of 20 years (1994-2013) collected from the published report of the FIRS of various years, OLS regression analysis was use to investigate the relationship that exist between the dependent and independent variables. The findings revealed that taxes have a significant effect on the Economic growth in Nigeria. It showed that the proportion of indirect to total tax have increased over the years [30].

Jina, Lawrence and Bezum (2017) examined the causal relationship between petroleum profits tax and economic growth in Nigeria over the years 1999 to 2015. Relevant data on real gross domestic product, petroleum profits tax, companies' income tax and value added tax were collected from the Central Bank of Nigeria Statistical Bulletin, 2015 edition, the Annual Report and Accounts of the CBN, for 2014, and journal articles. The econometric technique of ordinary least squares (OLS) is used to estimate the regression line, the Correlogram Q Statistic is used to test for stationarity of the variables, the Johansen Cointegration test is used to establish any long run relationship among the variables of the research, and the granger causality test is used to determine the nature and direction of causality

between petroleum profits tax and economic growth in Nigeria over the relevant years. The study, on the basis of findings, concluded that petroleum profits tax has a significant positive relationship with economic growth, but does not granger cause economic growth over the years under consideration [31].

Abata (2014) focused on the impact of tax revenue on Nigeria economy. Descriptive survey design was adopted and simple random sampling technique was used in the selection of the sample size. 100 copies of questionnaires were administered to workers of the Federal Board of Inland Revenue (FBIR), Lagos, Nigeria. 75 questionnaires were retrieved and found usable for the study hence, giving a 75% response rate. Four Hypotheses were formulated and tested using Chi-square statistical tool of analysis. The findings showed that tax revenue significantly impact on Federal Government Budget implementation in Nigeria, Tax administrative system significantly affected the revenue generated in Nigeria, Tax evasion significantly affected government revenue in Nigeria, and Lack of training on the part of tax officers significantly affected the generation of government revenue in Nigeria [32].

Akintoye and Tashie (2013) examined the effect of Tax compliance on economic growth and development in Nigeria. A comparative analysis of the willingness to pay tax by citizens in two (2) large States of the Federation, Lagos and Oyo State was presented. Primary data was collected through the administering of questionnaires to self-employed in each senatorial district in Oyo and Lagos States. Frequencies and percentages were used to measure the demographic variables of the respondents, and also the factors that affect the willingness to pay tax, while the Chi-square technique was used to measure the difference between willingness to pay tax of citizens in Lagos and Oyo States. It was discovered that many Nigerians are complying with tax payment and that the willingness of citizens to pay tax in Lagos State is significantly higher than that of Oyo State [33].

Kanghua and Shan (2013) studied the mechanism of how economic growth and tax reform affect total tax revenue and structure (total amount of the tax, the value-added tax and the corporate income tax) over the period (1950-2011). Descriptive statistics, multi-segment linear regression model and principal component analysis were employed. The empirical results showed that economic growth not only has a significant impact on the total tax revenue and structure changes, but also has a long-term stability relationship with total tax revenue. And in a long term, there is no extraordinary growth of tax revenue. In addition, every tax reform shows a clear impact on the tax structure, while the impact of changes in the total tax revenue is diminishing over time [34].

John and Suleimaan (2014) investigated the impact of value added tax on the economic growth of Nigeria. Ordinary Least Square technique was employed to test the hypotheses formulated. The result showed that VAT contributes significantly to the total tax revenue of government and by extension the economic growth of Nigeria [35].

Adeyemo (2017) re-evaluated the effectiveness and efficiency

of the administration of VAT in Nigeria, as well as to appraise the benefits inherent in the adoption of VAT with respect to its impact on Nigerian economic growth within the period 1994-2014. To effectuate the objectives of the study, relevant secondary data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, Federal Inland Revenue Service (FIRS), and other relevant government agencies. The empirical analysis was based on multiple regression technique. Economic growth was proxy by Gross Domestic Product and the result showed that there is no significant relationship between Value Added Tax and Economic growth, there is a significant relationship between Values Added Tax and the total revenue generated in Nigeria and that VAT administration in Nigeria is effective and not efficient [36].

Nasiru, Haruna and Abdullahi (2016) examined the impact of VAT on the level of economic activities in Nigeria from its inception to 2014. The study uses secondary data which was analyzed using Johansen (1988) co-integration test. The quarterly data ranges from 1994 Q4 to 2014 Q4. The study found evidence of a significant positive impact of VAT on economic growth. In the same vein, other government revenues, which include all oil receipts and other receipts into the federation account other than VAT were also found to be positively related to economic growth during the study period [37].

Iniyama and Ubesie (2016) empirically examined the effect of Value Added Tax and Customs and Excise Duties on Nigeria Economic Growth in Nigeria. The study covered the period of 2000-2015 and employed simple regression analysis and Pearson correlation techniques. Findings revealed that non-oil tax revenue affects Nigeria Gross Domestic Product in Nigeria pointing out that Value Added Tax and Customs and Excise Duties are some of the major contributors to Nigeria Gross Domestic Product [38].

#### 1.4. Research Design

A research design is a format employed to accomplish a systematic application of the scientific method of investigation [38]. This study adopted the *ex-post facto* research design since it is a longitudinal study and the data obtained cannot be manipulated by the researcher. Specifically, the data used was annual time series secondary data extracted from the Central Bank of Nigeria (CBN) statistical bulletin (2017) edition and National Bureau of Statistics (NBS) annual reports. Other sources of numerical information were Journals articles, Newspapers, textbooks and other published and unpublished materials.

#### 1.5. Model Specification

The research focused on federally collected taxes. It adapts the empirical model in the work of Onyele and Nwokoacha (2016). Particularly, the study employed the Vector Autoregressive (VAR) method of Granger causality model and Vector Error Correction Mechanism (VECM) [24]. The Granger (1969) mechanism for causal or directional relationship between two variables can be specified thus:

$$y_t = \sum_{i=1}^k \alpha_i y_{t-i} + \sum_{j=1}^p \beta_j \mu_{t-j} + \varepsilon_t \quad (1)$$

y = the variable whose causation is being appraised  
 $y_{t-1}$  = lagged values of the variable.  
 Such that:

$$GDP = f(Taxation, TR) \quad (2)$$

Where,  
 GDP=Gross Domestic Product

$f$  = Mathematical Functionality

$$LGDP_t = \alpha_0 + \alpha_{1i} \sum_{i=1}^k LVAT_{t-i} + \beta_{1i} \sum_{i=1}^k LTR_{t-i} + \mu_t \quad (3)$$

$$LVAT_t = \delta_0 + \alpha_{2i} \sum_{i=1}^k LGDP_{t-i} + \beta_{2i} \sum_{i=1}^k LTR_{t-i} + \mu_t \quad (4)$$

$$LTR_t = \varphi_0 + \alpha_{3i} \sum_{i=1}^k LGDP_{t-i} + \beta_{3i} \sum_{i=1}^k LVAT_{t-i} + \mu_t \quad (5)$$

However, the long-run and short-run dynamics between Value Added Tax (VAT), Total Revenue (TR) and Gross Domestic Product (GDP) was tested using the VECM model.

$$\Delta L(GDP_t) = \alpha + \sum_{i=1}^a \phi_i \Delta L(GDP)_{t-1} + \sum_{i=1}^b \phi_i \Delta L(VAT)_{t-1} + \sum_{i=1}^b \phi_i \Delta L(TR)_{t-1} + \phi_i EC_{t-1} \quad (6)$$

$$\Delta L(VAT_t) = \alpha + \sum_{i=1}^a \phi_i \Delta L(VAT)_{t-1} + \sum_{i=1}^b \phi_i \Delta L(GDP)_{t-1} + \sum_{i=1}^b \phi_i \Delta L(TR)_{t-1} + \phi_i EC_{t-1} \quad (7)$$

$$\Delta L(TR_t) = \alpha + \sum_{i=1}^a \phi_i \Delta L(TR)_{t-1} + \sum_{i=1}^b \phi_i \Delta L(VAT)_{t-1} + \sum_{i=1}^b \phi_i \Delta L(GDP)_{t-1} + \phi_i EC_{t-1} \quad (8)$$

Where,  $\Delta$  stands for difference operator,  
 $\mu_t$ =Stochastic white noise associated with model.  
 $L$ =Log-transformational operator.

$\alpha_i, \varphi_0, \phi_i, \beta_i$ , and  $\delta_i$  are the model parameters

The lag length is determined automatically by the modified Akaike Information Criterion (AIC).  $EC_t$  is the error correction term tagged by one period, while  $\phi$  is the speed of price adjustment parameter. The error correction term assess the deviation of the variables from the long-run equilibrium association.

Also, Pearson Product Moment Correlation Coefficient (PPMCC) was employed to measure the degree of linear association among the study variables. Here, we have that:

$$r = \frac{n \sum XY - \sum X \sum Y}{\sqrt{[(n \sum X^2 - (\sum X)^2)(n \sum Y^2 - (\sum Y)^2)]}} \quad (9)$$

Where,

$n$  = sample size;

$\sum XY$  = Sum of cross products;

$\sum X$  = Sum of X values;

$\sum Y$  = Sum of Y values;

$\sum X^2$  = Sum of squared X values;

$\sum Y^2$  = Sum of squared Y values.

## 2. Data Presentation, Analysis and Interpretation of Results

**Table 1.** Annualized time series data of Gross Domestic Product (GDP), Total Revenue (TR), and Value Added Tax (VAT) in Billion from 1994-2017.

Years	GDP (B)	TR (B)	VAT (B)
1994	1399.70	49.51	5.03
1995	2907.36	69.64	6.26
1996	4032.30	89.53	11.29
1997	4189.25	96.96	13.91

Taxation is operationalized by value added tax (VAT)

TR=Total Revenue

To ensure linearity and trimming down the data size without losing its real value, the variables were logged transformed.

Such that:

Years	GDP (B)	TR (B)	VAT (B)
1998	3989.45	143.20	16.21
1999	4679.21	658.57	17.59
2000	6713.57	649.99	29.77
2001	6895.20	886.35	32.52
2002	7795.76	1440.00	40.78
2003	9913.52	1464.00	39.01
2004	11411.07	1800.00	42.06
2005	14610.88	2040.00	62.72
2006	18564.59	2701.32	68.59
2007	20657.32	3543.46	120.57
2008	24296.33	4672.53	115.73
2009	24794.24	4639.54	120.33
2010	54612.26	5716.24	106.01
2011	62980.40	3410.10	318.00
2012	71713.94	3572.52	347.69
2013	80092.56	3905.38	389.53
2014	89043.62	3672.03	388.85
2015	94144.96	2859.02	381.27
2016	101489.49	2471.81	397.06
2017	113711.63	2654.62	402.10

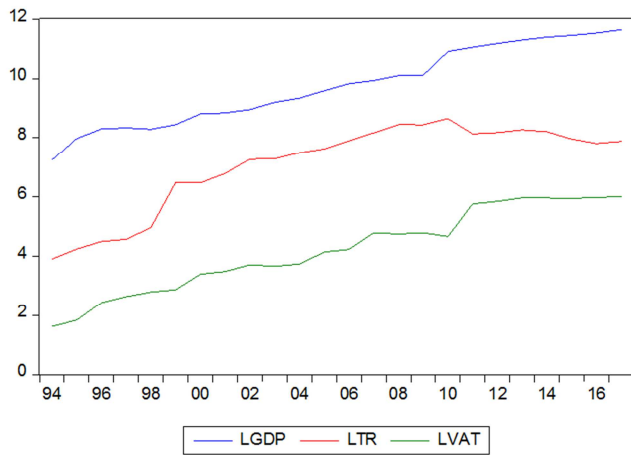
Source: CBN Statistical Bulletin, 2017

**Table 2.** Data Description and Graphical Representation of the Study Variables.

Statistics	LGDP	LTR	LVAT
Mean	9.740786	7.069863	4.207310
Median	9.709267	7.716706	4.183414
Maximum	11.64142	8.651067	5.996701
Minimum	7.244013	3.902175	1.615420
Std. Dev.	1.322915	1.503084	1.408600
Skewness	-0.027534	-1.019757	-0.169566
Kurtosis	1.778145	2.583204	1.880708
Jarque-Bera	1.495963	4.333336	1.367825
Probability	0.473321	0.114559	0.504639
Sum	233.7789	169.6767	100.9754
SumSq. Dev.	40.25240	51.96299	45.63553
Observations	24	24	24

Source: Author's EviewsResult





Source: Own computation

**Figure 2.** Graphical Representation of directly proportional relationship between VAT and the country's revenue and Overall GDP.

**Table 3.** Unit Root Test.

Variable	ADF-Stat	Critical Values @5%	p-value	Order of Integration	Inference
L(GDP)	-5.27	-3.63**	0.0018	I(1)	Stationary
L(TR)	-5.38	-3.63**	0.0014	I(1)	Stationary
L(VAT)	-5.84	-3.63**	0.0005	I(1)	Stationary

\*\* Indicates stationary at 5% level of significance

Source: Author's E-views 10 computation

As shown in table 3, the series were stationary at first differencing. Hence, they are said to be integrated of order one. The researcher equally performed correlation analysis to ascertain the degree of linear association among the variables. The result is as presented in table 4 below:

**Table 4.** Correlation Analysis Result.

Covariance Analysis: Ordinary				
Sample: 1994 2017				
Included observations: 24				
Correlation				
t-Statistic				
Probability	LGDP	LTR	LVAT	
LGDP	1.000000			
	-----			
LTR	0.840901	1.000000		
	7.287975	-----		
	0.0000	-----		
LVAT	0.983630	0.868352	1.000000	
	25.60311	8.212398	-----	
	0.0000	0.0000	-----	

Source: Own computation using Eviews 10.0

The Pearson correlation test result indicates that there is no negative or zero correlation. However, the variables interact positively and significantly among themselves ( $r > 0.6$ ;  $p < 0.001$ ). For which course, the presence of cointegration is

The descriptive statistics a close range in distribution of the data series (with less volatile standard deviation). The data series are all negatively skewed and without excess kurtosis. The Jarque-Bera statistic and associated probability values greater than 0.05 indicates that series of each variable follows a smooth and normal distribution. The normality test result with Jarque-Bera probability values greater than 0.05 indicates that the residuals satisfy the basic stochastic assumption of regression as:  $\varepsilon_t \sim \text{NID}(0, \sigma^2)$ . This implies that the error component of the regression analysis follows a normally and identical distribution with mean of zero and variance of  $\sigma^2$ . Hence, the conclusion drawn from the regression result is valid.

On the other hand, the graphical representation shows a consistent rise in the series of the variables under investigation. This implies that as VAT increases, the country's revenue and overall GDP appreciates.

suspected. Estimate of the long and short run equilibrium relationship is as shown in table 5 below:

**Table 5.** Long-run and Short-run Estimates.

Vector Error Correction Estimates			
Sample(adjusted):19972017			
Included observations:21 after adjustments			
Standard errors in()&t-statistics in[]			
Cointegrating Eq:	CointEq1		
LGDP(-1)	1.000000		
	0.185359		
LTR(-1)	(0.02630)		
	[7.04800]		
	-1.033117		
LVAT(-1)	(0.03498)		
	[-29.5368]		
C	-6.706572		

Error Correction:	D(LGDP)	D(LTR)	D(LVAT)
CointEq1	0.670034	-1.361009	0.754708
	(0.50901)	(1.08652)	(0.43795)
	[1.31635]	[-1.25263]	[1.72327]
	-1.055176	0.553871	0.274271
D(LGDP(-1))	(0.68024)	(1.45203)	(0.58528)
	[-1.55118]	[0.38145]	[0.46861]
	-0.112864	-0.020137	0.299165
D(LGDP(-2))	(0.31312)	(0.66837)	(0.26941)
	[-0.36045]	[-0.03013]	[1.11046]
	0.155650	0.015998	0.345585
D(LTR(-1))	(0.11350)	(0.24227)	(0.09765)
	[1.37141]	[0.06603]	[3.53892]
	0.128932	-0.126656	-0.009895
D(LTR(-2))	(0.17333)	(0.36999)	(0.14913)
	[0.74385]	[-0.34232]	[-0.06635]

ErrorCorrection:	D(LGDP)	D(LTR)	D(LVAT)
D(LVAT(-1))	0.204038 (0.31585) [0.64600] -0.100540	-0.275453 (0.67421) [-0.40856] -0.090239	0.055297 (0.27176) [0.20348] 0.119739
D(LVAT(-2))	(0.19669) [-0.51115]	(0.41986) [-0.21492]	(0.16924) [0.70752]
C	0.289188 (0.08207) [3.52370]	0.166513 (0.17518) [0.95051]	-0.028656 (0.07061) [-0.40582]
R-squared	0.360040	0.426700	0.820723
Adj. R-squared	0.015447	0.118000	0.724190
Sumsq. resid	0.373971	1.703976	0.276848
S. E. equation	0.169608	0.362043	0.145932
F-statistic	1.044826	1.382247	8.501952
Loglikelihood	12.49735	-3.426350	15.65478
AkaikeAIC	-0.428319	1.088224	-0.729027
SchwarzSC	-0.030406	1.486137	-0.331113
Meandependent	0.159016	0.161404	0.170133
S. D. dependent	0.170934	0.385501	0.277872
Determinantresidcovariance(dofadj.)		3.83E-05	
Determinantresidcovariance		9.09E-06	
Loglikelihood		32.49808	
Akaikeinformationcriterion		-0.523627	
Schwarzcriterion		0.819330	
Numberofcoefficients		27	

Source: Author's Result

The Vector Error Correction Model (VECM) as estimated in table 5 above shows that for the short-run estimates (the adjustment coefficients on CointEq1), total revenue and Value added tax were significant. The case is consistent in the long-run. To ascertain whether the relationship could be causal, the Pairwise Granger Causality test was performed. Result of the causal analysis is presented in table 6 below:

**Table 6.** Pairwise Granger Causality Tests.

Sample:19942017;Lags:2			
NullHypothesis:	Obs	F-Statistic	Prob.
LTRdoesnotGrangerCauseLGDP	22	1.53030	0.2448
LGDPdoesnotGrangerCauseLTR		6.01474	0.0106
LVATdoesnotGrangerCauseLGDP	22	0.43522	0.6541
LGDPdoesnotGrangerCauseLVAT		14.4915	0.0002
LVATdoesnotGrangerCauseLTR	22	0.08600	0.9180
LTRdoesnotGrangerCauseLVAT		0.66839	0.5255

Source: Author's Eviews 10 result

The Pairwise Granger causality test result provided evidence that there is a unidirectional causality running from GDP to value added tax (VAT) in Nigeria and from GDP to total revenue generated within the period. This implies that as Nigeria GDP increases, VAT and overall total revenue generated by government of the country increases.

### 3. Conclusion and Recommendations

This study empirically analyzed taxation as a tool for revenue generation in Nigeria in the three tiers of government namely: Federal, State and Local Governments for structural and economic development. It particularly focused value added tax (VAT) and used the Vector Error Correction and Pairwise Granger Causality analytical

mechanisms. Findings from the study revealed the value added tax (VAT) and tax revenue have both short and long run significant influence on the growth of Nigerian economy. This shows that value added tax is one of the various sources of revenue to the government and as such contributes substantially to the growth of Nigerian economy. On this background, the following recommendations were made:

- 1) Revenue generated from VAT should be boosted by closing every VAT revenue leakages and sensitizing the managers of companies operating in Nigeria on the need to remit the VAT revenue collected to the government.
- 2) Government should broaden the tax base by providing basic infrastructures and enabling environment for private enterprise to thrive. Also, prudent management and productive utilization of public funds should be encouraged.
- 3) The economy of Nigeria should be restructured for taxation to serve as a major source of non-oil revenue thereby reducing the level of tax evasion through an efficient and effective tax administration.
- 4) Judicious use of tax money should be made in order to encourage tax payers to continue to pay taxes.
- 5) There is the need for government at all levels (Federal, state and local) to clearly state the basic objectives of its tax system and the relationship between these objectives. This will assist to give the tax administrators a sense of direction and make the tax payer see clearly the reasons why they should pay tax as at when due. It will also help to block possible tax evasion by appropriate policing of exports and imports.

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