Social Sciences Journal of Policy Review and Development Strategies | **SSJPRDS**
p-ISSN: 2488-9636 | e-ISSN: 2488-9628
Volume 6, Number1 August, 2024

Impact of Sectoral Value-Added Taxes on Revenue Generation in Nigeria (1990-2023)

[1]Yaska Sambo Alan, [2]Akpan, S. Michael, & [3]Ologunla E. Sunday
[1,2&3]Department of Economics,
Bingham University Karu, Nasarawa State

Article DOI: 10.48028/iiprds/ssjprds.v6.i1.08

Abstract

Understanding the influence of taxes is crucial for formulating effective fiscal policies aimed at enhancing revenue collection and promoting economic growth. This study examines the impact of sectoral value-added taxes (VAT) on government revenue generation in Nigeria from 1990 to 2023, with a focus on manufacturing value-added tax (MVAT), agriculture value-added tax (AVAT), and education value-added tax (EVAT) utilizing the Autoregressive Distributed Lag (ARDL) model, the long-run results reveal diverse impacts of these taxes on government revenue like MVAT had a negative coefficient of -3866.576 with a standard error of 2121.432 and a t-statistic of -1.822625, suggesting an insignificant negative impact on revenue generation at the 5% significance level (Prob. 0.0841). This implies that changes in MVAT do not significantly influence government revenue in the long term. Similarly, AVAT exhibited a positive coefficient of 598.2756 with a standard error of 1306.034 and a t-statistic of 0.458086, also indicating an insignificant impact on revenue generation (Prob. 0.6521). In contrast, EVAT showed a significant positive effect with a coefficient of 5528.653, a standard error of 2627.190, and a t-statistic of 2.104397 (Prob. 0.0489). This highlighted the substantial positive impact of EVAT on long-term revenue generation, suggesting that improvements in EVAT collection can significantly benefit government revenue. The results underscored the need for targeted policy interventions to enhance VAT compliance in the manufacturing and agricultural sectors while leveraging the education sector's potential for substantial revenue contributions and generation in Nigeria.

Keywords: *Value-added tax, Revenue Generation, Education, Agriculture, Manufacturing*

Corresponding Author: Yaska Sambo Alan

Background to the Study

Globally, the government using fiscal policy adjusts its level of spending to monitor and influence a nation's economy. It is used alongside the monetary policy which the central bank uses to influence the money supply in a nation. These two policies are used to achieve macroeconomic goals in a nation. These goals include price stability, full employment, reduction of poverty levels, high and sustainable economic growth, favourable balance of payment, and reduction in a nation's debt. The intent of fiscal policy is essentially to stimulate economic and social development by pursuing a policy stance that ensures a sense of balance between taxation, expenditure and borrowing that is consistent with sustainable growth and geared towards poverty reduction. One of the major tools used by the government is tax. It is said that no country can run and grow without taxes. Therefore, taxation is a system as old as the economy itself and no one has been able to put an exact date on it.

Also, the role of taxation in economic development cannot be overstated, with Value Added Taxes playing a critical role in revenue generation for many governments. According to the World Bank (2022), value-added tax is a significant source of income for over 160 countries, contributing to about 20% of total tax revenue on average. In developing economies, value-added tax is particularly crucial due to its broad base and relatively high revenue potential. As countries strive to achieve economic stability and growth, the efficient collection and management of value-added tax become paramount.

Taxation in Nigeria has a long history of existence, even before the country gained independence, starting small to grow into what it is today. However, it can be traced to have actually come into formal rule in the 1930s. The collection of tax by government is not tied to any direct and specific benefit to the taxpayer. Although, it is not basically tied to the conferment of any direct and specific benefit to the taxpayer, it is perfectly recognized by taxpayers and the tax collectors. Government revenue has historically relied heavily on oil exports, accounting for approximately 85% of the national income in the early 2000s (Central Bank of Nigeria, 2023). However, fluctuations in global oil prices have highlighted the need for diversified revenue streams. Over the years, various sectors have been brought into the value-added tax net, including manufacturing value-added tax, agriculture value-added tax, and education value-added tax, each contributing uniquely to the government's coffers. Manufacturing value added tax is particularly significant in Nigeria's revenue matrix, given the sector's role in industrialization and employment.

The National Bureau of Statistics (NBS, 2022) opined that the manufacturing sector contributed about 15% to the total value-added tax revenue in recent years. Agriculture value-added tax, although traditionally underutilized, has seen gradual improvement, reflecting efforts to formalize the agricultural sector and enhance its contribution to national income. Education value-added tax represents a more nascent area, aimed at harnessing the growing private education sector to support government revenue. The Nigerian government has implemented several initiatives to boost value-added tax collection and overall revenue. In 2019, the Finance Act was introduced, which increased the value-added tax rate from 5% to 7.5%, a move projected to enhance revenue by over 30% annually (Ministry of Finance, 2020).

Other initiatives include the establishment of the Federal Inland Revenue Service (FIRS) reforms since 2007 aimed at improving tax administration efficiency and compliance (FIRS, 2024).

Despite these efforts, Nigeria faces significant challenges in maximizing value-added tax revenue. These include widespread tax evasion, a large informal economy, administrative inefficiencies, and a lack of public awareness about value-added tax compliance. Comparing Nigeria's value-added tax revenue efforts with other African countries, such as South Africa and Kenya, reveals a gap in both policy implementation and tax administration effectiveness. South Africa, for instance, has a well-structured VAT system that contributes significantly to its GDP, demonstrating the potential for value-added tax to drive economic growth when properly managed (OECD, 2022). In this context, enhancing value-added tax compliance and broadening the tax base can significantly improve government revenue and, consequently, public service delivery and economic development. The main objective of this paper is to investigate the impact of value-added taxes on government revenue in Nigeria from 1990 to 2023.

Specifically, this paper seeks to examine how different sectors of manufacturing, agriculture, and education contribute to the total value-added tax revenue. Therefore, the paper's hypotheses are stated as follows:

H_{01}: Manufacturing value-added tax has no significant impact on revenue generation in Nigeria.

H_{02}: Agriculture value-added tax has no significant impact on revenue generation in Nigeria.

H_{03}: Education value-added tax has no significant impact on Revenue generation in Nigeria.

Literature Review

Conceptual Review

Awa and Ibeanu (2020), revenue, like public expenditure, is very necessary for the government to perform its various functions for the welfare of society and revenue holds the same position in the study of public finance, that production holds in the study of economics. Thus, government revenue generation refers to the various methods and mechanisms through which a government collects money to finance its activities and services and this includes taxation, fees, fines, and other income sources (Adegbite & Fasina, 2019). Effective revenue generation is crucial for a government to maintain public infrastructure, provide social services, and support economic development (Okoroafor & Nwaeze, 2013). Also, Daniel *et al.,* (2017) opined that manufacturing is the process of converting raw materials, components, or parts into finished goods that meet a customer's expectations or specifications and the manufacturing sector encompasses industries such as food and beverages, textiles, and machinery, making it a critical component of the value-added tax system. Also, according to Ebele and Iorember (2017), manufacturing value-added tax is a tax levied on the value added to products at each stage of the manufacturing process and it is designed to be paid by manufacturers and passed on to consumers through the final product price and also Bada (2017) opined that manufacturing value-added tax plays a significant role in government revenue due to the sector's substantial contribution to the economy.

On the other hand, an agricultural value-added tax is also a tax imposed on the value added at each stage of agricultural production and this includes activities such as planting, harvesting, and processing of agricultural goods (Onokala & Olajide, 2020). Also, Ebomuche and Ihugba, (2010) opined that the agricultural sector is a vital part of the economy, employing a large portion of the population and contributing significantly to GDP. Agriculture value-added tax aims to formalize the agricultural sector, ensuring that it contributes fairly to government revenue. By taxing the value added in agriculture, the government can generate income supporting rural development and agricultural modernization (Orji *et al.,* 2020). Also, Orisadare & Fadare (2022) defined education value-added tax as a tax on the value added by educational institutions, particularly private schools and universities and this tax is designed to tap into the growing private education sector in Nigeria, which has expanded due to increasing demand for quality education. Education value-added tax contributes to government revenue by ensuring that educational services, which benefit from public infrastructure and services, pay their fair share of taxes and the revenue generated from education value-added tax can be reinvested in the public education system, enhancing overall educational standards and accessibility (Ayres & Warr, 2019).

Empirical Review

In a study carried out by Musa *et al.,* (2023) where he examined value-added tax and its effect on revenue generation in Nigeria from 1999-2019 using descriptive and Vector Error Correction Model methods for analysis which showed that value-added tax is statistically significant to revenue generation in Nigeria while Ayonete (2023) examined the effect of VAT on economic development in Nigeria from 1994-2019, employing Auto-Regressive Distributed Lag (ARDL) technique found that value added tax was positive and significantly related to the human development index at short-run and long-run; the consumer price index was non-significant at 5% in the short-run but was in the long-run with a positive sign; while the inflation rate was significant at both short-run and long-run. The study concluded that value-added tax and a moderate increase in general price level stimulate economic development in Nigeria. In a similar study Musa *et al.,* (2023) focused on how Nigeria's value-added tax affected the country's ability to generate income from 1999 to 2019 and used a simple regression technique which indicated that company income tax and Value Added Tax had a statistically significant impact on Nigeria's income generation. As Cyril *et al.,* (2023) study is to determine the effect of education tax on firms' value of firms in the Consumer products industry in Nigeria. Using descriptive statistics, correlation and regression analysis. Hypotheses testing was done with linear regression analytical techniques using the SPSS analytical software package. The results indicated that the education tax has an insignificant but positive effect on the return on investment of the sampled consumer products industry in Nigeria

Mukolu and Ogodor (2021) analyzed empirically the impact of value-added tax on economic growth in Nigeria from 1994-2018. Data using the Augmented Dickey Fuller method of analysis was employed to analyse the data which showed that the value of VAT had a positive significant impact on economic growth (GDP) in Nigeria. Similarly, Ikechukwu *et al.,* (2021) investigated the impact of direct taxes on income redistribution in the context of Nigeria. employing the Fully Modified Least Squares (FMOLS) to analyze the data and found that

company income tax and education tax had insignificant negative effects on income redistribution, while personal income tax and petroleum profit tax had significant positive effects on income redistribution in Nigeria. While Efuntade (2020) examined value-added tax and its effect on revenue generation in Nigeria. using descriptive and Vector Error Correction Model method of analysis which found that value-added tax is statistically significant to revenue generation in Nigeria.

Aminu (2020) investigated the impact of education tax and investment in human capital on economic growth in Nigeria utilizing the Non-Linear Autoregressive Distributed Lag Model of cointegration covering the period of 25 years from 1995 to 2019. The findings reveal that education tax and investment in human capital have positive and significant effects on the growth of the Nigerian economy over the sampled period. Another study by Ikhatua and Ibadin (2019) investigated the determinants of tax revenue effort in Nigeria. To achieve this, secondary data, as time series data, covering a period of 1980 to 2015 and adopted a longitudinal research design and used the Autoregressive Distributed Lag (ARDL) technique to evaluate the models. The Manufacturing Sector Productivity, Telecommunication Sector Productivity and Capital Flight had significant but negative effects on tax revenue efforts in Nigeria. Oladipo *et al.,* (2019) investigated the effect of company income and value-added taxes on the output of the manufacturing sector in Nigeria using Auto-Regressive Distributed Lags. Results: The long-run result revealed that there is a positive relationship between corporate taxes and the output of the manufacturing sector, while value-added tax revealed a negative relationship with the output Stephen and Augustine (2019) investigated the impact of value-added tax on revenue generation in Nigeria with the Simple percentages, bar charts, pie charts, and chi-square analysis. The study found that VAT has a positive impact on revenue generation in Nigeria. In like manner, Amory's (2019) study examined the impact of tax revenue on the economic growth in Nigeria from 1994-2015 with the use of Ordinary Least Square (OLS) and found that tax revenue has a significant impact on Nigerian economy growth.

Olaoye and Atilola (2018) examined the effect of e-tax payments on revenue generation in Nigeria. The study period covered six (6) years and three (3) quarters, spanning from the first quarter of 2012 to the second quarter of 2018. the period for pre-e-taxation covered thirteen (13) quarters, spanning from the first quarter of 2012 to the first of 2015 while the period for post-e-taxation covered thirteen (13) quarters, spanning from the second quarter of 2015 to the second quarter of 2018. The analysis was carried out using Trend analysis, descriptive statistics of mean and standard deviation, and paired sampled t-test. The findings revealed that there was an insignificant positive difference between pre and post-value-added tax revenue with t-statistics and p-value of 0.520 and 0.612 respectively Oghuma (2017) also focused on Value Added Tax (VAT) and economic growth in Nigeria from 1994 to 2013 with the employing the simple linear Ordinary Least Square (OLS) regression were it found that VAT is statistically significant, suggesting that VAT has positive relationship with economic growth in Nigeria and Gatawa *et al.,* (2016) empirically examined the impact of VAT on the level of economic activities in Nigeria from its inception to 2014 using. The quarterly data ranged from 1994 Q4 to 2014 Q4 with Johansen's (1988) co-integration test and descriptive analysis which found a significant positive impact of VAT on economic growth. Finally, Luqman, (2014) examined the

impact of value-added tax on revenue generation in Nigeria from 1994 to 2012 using regression analysis and descriptive analysis which showed that there is a significant relationship between value-added tax and consolidated revenue generation in Nigeria. At 5% level of significance.

Theoretical Framework

The "optimal commodity taxation theory Frank P. Rams**ey** is credited with the foundational work on optimal commodity taxation theory. The theory was stated in his seminar paper titled "A Contribution to the Theory of Taxation**,**" which was published in 1927 where he emphasized the interaction between the economic growth of various countries through commodity tax and the revenue it generates on the assumption that all consumers are similar. The standard theory of "optimal commodity taxation theory" posits that a tax system should be chosen to maximize a social welfare function subject to a set of constraints. The literature on optimal taxation typically treats the social planner as a utilitarian: that is, the social welfare function is based on the utilities of individuals in the society. Optimal taxation is the taxation that reflects society's choices between the rival goals of equality and economic efficiency, the starting point of which is to maximize social welfare. The optimal taxation of commodities that was launched by Ramsey is based on the rule of inverse elasticity, which holds that the taxation of goods with low elasticities of demand at a higher rate will reduce the loss of efficiency (Duarte, 2017).

The criticism of this rule is that essential goods to meet basic needs have low price elasticity of demand, while luxury goods have high price elasticity. The central element of the theory of optimal taxation applies to individuals based on what the government knows about them. Second welfare theorem states, that where several convexity and continuity assumptions are satisfied, an optimum is a competitive equilibrium once initial endowments have been suitably distributed. In general, complete information about the consumers for the transfers is required to make the distribution necessary, so the question of feasible lump-sum transfers arises. Usually, the optimal tax systems combine a flat marginal tax rate plus lump sum grants to all individuals so that the average tax rate rises with income even if the marginal does not (Stiglitz, 2014).

Optimal linear income and linear capital tax are inversely related to the elasticity, the revenue-maximizing tax rates are calculated when weights on capital and labour are zero. The non-linear capital and labour taxes are dependent on the average welfare weight of capital income higher than the product of the rate of return of capital and capital stock itself, and average welfare weight higher than the individual earnings. Pareto weights here are proportional to the net rate of return of capital and density of taxed labour income, and probability density function of the tax system which is linearized at points of net tax return (substitution effects, no income effects) and earnings (Saez & Stantcheva, 2016).

Methodology

Research Design, Sources and Nature of Data

The research design for this study is ex-post facto research and the secondary annual time series data from 1990 to 2023 was sourced from the Federal Inland Revenue of Nigeria data bank 2024 and Central Bank of Nigeria Statistical Bulletin 2023.

Model Specification

The study adopted and used the Autoregressive Distributed Lag (ARDL) technique which is applied to long-term series irrespective of whether the series is stationary at levels 1(0) or first order 1(1); and it is used to test for the existence of a linear long-run relationship when the order of integration of the underlying regressors is not known with certainty (Pesaran et al., 1996,2001). The foundation of the model was based on the theoretical framework of the study. Also, the initial model was adapted from the work of Anthony Kwanti and Dauda. (2022). who examined the impact of value-added-tax (VAT) on the economic growth of Nigeria from 1994-2020 using ordinary least square (OLS) and using the models below:

$$GDP = X_0 + X_1 VAT + e_t \quad (1)$$

$$FCS = X_0 + X_1 VAT + e_t \quad (2)$$

Where;
GDP = Gross Domestic Product,
VAT = Value Added Tax,
FCR = Federally Collected Revenue
et = error term. The equations were modified to form a single equation and specified to follow the paper objective of this study:

$$REV = f(MVAT, AVAT, EVAT) \quad (3)$$

Therefore, explicitly the model becomes:

$$REV_t = \beta_0 + \beta_1 MVAT + \beta_2 AVAT + \beta_3 EVAT + e_t \quad (4)$$

Where; REV is the revenue generation at time t in Nigeria, MVAT is Manufacturing value added tax at time t in Nigeria, AVAT is Agriculture value added tax at time t in Nigeria, EVAT is education value added tax. at time t in Nigeria while β_0 is Intercept, β_1, β_2, and β_3 are Slope and e_t is the Error Terms. The Autoregressive Distributed Lagged (ARDL) model that will be used in this study is specified as follows:

$$REV = \beta_0 + \sum_{g=1}^{i} \beta_1 \Delta REV_{t-i} + \sum_{h=1}^{j} \beta_2 \Delta MVAT_{t-i} + \sum_{i=1}^{k} \beta_3 \Delta AVAT_{t-i} + \sum_{j=1}^{l} \beta_4 \Delta EVAT_{t-i} + \beta_5 \Delta REV_{t-i} + \beta_6 \Delta MVAT_{t-i} + \beta_7 \Delta AVAT_{t-i} + \beta_8 \Delta EVAT_{t-i} + e_t \quad (5)$$

Equation (5) was used to examine the short-run and long-run relationship and the impact of value added taxes on revenue generation in Nigeria. While the Error Correction Model (ECM) used in this study is specified as follows:

$$\Delta REV = \beta_0 + \sum_{g=1}^{i} \beta_{1i} \Delta REV_{t-i} + \sum_{h=1}^{j} \beta_{2i} \Delta MVAT_{t-i} + \sum_{i=1}^{k} \beta_{3i} \Delta AVAT_{t-i} + \sum_{j=1}^{l} \beta_{4i} \Delta EVAT_{t-i} + ECM_{t-i} + e_t \quad (6)$$

Equation 6 above is used to adjust the estimation until the ECM turns negative. The negative sign of the coefficient of the error correction term ECM (-1) shows the statistical significance of the equation in terms of its associated t-value and probability value.

Variable Description, Measurements and *A priori* Expectation

Table 1: Description of the Variables Used for the Model

Variable	Description/Measure	Type	Source	Apriori Expectation
REV	Revenue generation	Dependent	FIRS, 2024	
MVAT	Manufacturing value added tax	Independent	CBN, 2024	$\beta_1 >< 0$
AVAT	Agriculture value added tax	Independent	CBN, 2024	$\beta_2 >< 0$
EVAT	Education value added tax	Independent	CBN, 2024	$\beta_3 >< 0$

Source: Author Compilation, 2024

The a priori expectation is that β_1, β_2 *and* $\beta_3 >< 0$ indicating a positive or negative relationship between the dependent and independent variables, that is, increase/decrease in value-added tax like manufacturing value-added tax, agriculture value-added tax, education value added tax will lead to decrease/increase in revenue generation in Nigeria.

Method of Analysis

The study employed the Autoregressive Distributed Lag (ARDL) model which was developed by M. Hashem Pesaran and Pesaran in the late 1990s. It is a valuable tool used in analyzing the dynamic relationship between variables in the presence of both short-run and long-run components.

Presentation and Interpretation of Results

Descriptive Analysis

Table 2: Descriptive Analysis

	REV	**MVAT**	**AVAT**	**EVAT**
Mean	5675.175	35776.21	2730.790	35875.10
Median	5727.510	121.4300	22.71000	87.87000
Maximum	12586.50	1104038.	83474.29	1107455.
Minimum	192.8000	2.140000	0.210000	2.010000
Std. Dev.	4000.597	198261.1	14985.53	198876.8
Skewness	-0.010885	5.294645	5.294455	5.294644
Kurtosis	1.601889	29.03329	29.03199	29.03328
Jarque-Bera	2.525452	1020.243	1020.145	1020.242
Probability	0.282882	0.000000	0.000000	0.000000
Sum	175930.4	1109063.	84654.48	1112128.
Sum Sq. Dev.	4.800000	1.180000	6.740000	1.190000
Observations	31	31	31	31

Source: Researcher's Computation Using EViews-12 (2024)

Table 2 revealed that the average value of the revenue generation in Nigeria between 1986-2023 is 5675.175, the maximum is 12586.50 and the minimum is 192.8000. The average value for the Manufacturing value-added tax is 35776.21, the maximum is 1104038, and the minimum is 2.140000. The average value for the agriculture value-added tax is 2730.790, the maximum is 83474.29, and the minimum is 0.210000. The average value for the Education value-added tax is 35875.10, the maximum is 1107455, and the minimum is 2.010000. Also, the Jarque-Bera statistic tests the hypothesis that the series is normally distributed Jarque-Bera test with p-values less than 0.05 for MVAT, AVAT, and EVAT suggests deviations from normality. While REV, are normally distributed as their probability value is greater than 0.05. REV Kurtosis is Platykurtic less than 3 (less peaked than normal distribution), MVAT, AVAT, EVAT Kurtosis and Leptokurtic (more peaked than normal distribution)

Correlation Matrix Results

Correlation analysis is a statistical technique used to measure and describe the strength and direction of the relationship between two variables. In this context, the correlation analysis examines the relationship between sectoral value-added taxes (MVAT, AVAT, EVAT) and revenue generation (REV) in Nigeria. A positive correlation indicates that as one variable increases, the other tends to increase, while a negative correlation suggests that as one variable increases, the other tends to decrease.

Table 3: Correlation Matrix Results

Correlation Probability	**REV**	**MVAT**	**AVAT**	**EVAT**
REV	1.000000			

MVAT	0.524512	1.000000		
	0.0247	-----		
AVAT	0.626477	0.339991	1.000000	
	0.0105	0.04500	-----	
EVAT	0.624533	0.12500	0.41991	1.000000
	0.0146	0.1140	0.0400	-----

Source: Author's Computation, using E-Views 12, (2024)

The correlation between Manufacturing Value Added Tax (MVAT) and revenue generation (REV) is positive, with a correlation coefficient of **0.524512** and a probability value of **0.0247**. This result indicates a moderate positive relationship between MVAT and REV, suggesting that an increase in the manufacturing sector's VAT contributes to an increase in overall revenue generation. The statistical significance of this correlation, as indicated by the p-value, shows that the relationship is unlikely to have occurred by chance, highlighting the importance of the manufacturing sector in boosting government revenue through VAT.

Agriculture Value Added Tax (AVAT) also shows a positive correlation with revenue generation, with a correlation coefficient of **0.626477** and a probability value of **0.0105**. This stronger positive correlation compared to MVAT suggests that the agricultural sector's VAT has a more substantial impact on revenue generation. Given the significance level, it can be inferred that agricultural VAT is a crucial driver of revenue, potentially due to the sector's broad base and importance in Nigeria's economy. This finding emphasizes the critical role of the agricultural sector in contributing to the government's fiscal strength through VAT collection.

Education Value Added Tax (EVAT) has a correlation coefficient of **0.624533** with revenue generation and a probability value of **0.0146**. Similar to AVAT, the correlation is positive and relatively strong, indicating that VAT from the education sector significantly influences revenue generation. The significance of this correlation suggests that educational services, despite traditionally being seen as less directly revenue-generating, play an important role in the broader fiscal framework, perhaps through ancillary services or indirect economic contributions that enhance overall revenue.

Stationary Tests (Unit Root Tests)
This section shows the unit root of the variables using the Augmented Dickey-Fuller (ADF) Test to check the stationary at a 5 per cent level of significance.

Table 4: Unit Root Test Result

Variable	**Augmented Dickey-Fuller (ADF) Test**		
	ADF	**Critical Value @ 5%**	**Status**
REV	-5.600749	-3.562882	1(1)
MVAT	-2.863426	-2.967767	1(1)
AVAT	-1.890989	-1.951687	1(1)
EVAT	-3.776533	-3.574244	1(1)

Source: Author's Computation Using EViews-12 (2024)

Table 4 shows the stationary tests of revenue generation (REV), Manufacturing value added tax (MVAT), Agriculture value added tax (AVAT) and Education value-added tax (EVAT). Thus, Table 3 of the ADF test results revealed that REV, MVAT, AVAT and EVAT were not stationary at the level until they were differenced once, and they were said to be integrated of order 1(1). Furthermore, the Co-integration of the ARDL-Bounds Test will be used to test the long-run relationship among the variables,

Co-integration of ARDL-Bounds Test
This section shows the ARDL co-integration bounds test of the variables used in this paper.

Table 5: ARDL-Bound Testing

Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	8.692324	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Source: Researcher's Computation Using EViews-9 (2023)

Table 5 shows the ARDL bounds test for co-integration that was carried out for the models based on the research objectives. The model result shows that the F-statistic derived from the ARDL bounds test is 8.692324, and when compared with the critical values obtained from the Pesaran Table at a 5% level of significance, its value exceeded both 2.79 and 3.67 for 1(0) and 1(1), respectively. of revenue generation, manufacturing value-added tax, agriculture value-added tax and Education value-added tax are co-integrated at a 5% level of significance.

ARDL Regression Result

The Autoregressive Distributed Lag (ARDL)-ECM and long-run estimates presented here provide significant insights into how value added taxes impact revenue generation in Nigeria over short and long term.

Table 6: Method- ARDL-ECM and Long Run Estimates

Dependent Variable: RGDP

Error Correction Estimates

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(REV(-1))	-0.024577	0.109902	-0.223627	0.8254
D(REV(-2))	-0.453443	0.114205	-3.970444	0.0008
D(IAVAT)	261.8111	253.0776	1.034509	0.3139
D(IAVAT(-1))	-1337.594	318.8805	-4.194657	0.0005
D(IAVAT(-2))	-359.0524	267.5960	-1.341771	0.1955
D(IEVAT)	1459.504	260.7930	5.596408	0.0000
CointEq(-1)*	-0.421999	0.058180	-7.253374	0.0000
R-squared	0.960336			
Adjusted R-squared	0.939460			
F-statistic	46.00258			
Prob(F-statistic)	0.000000			
Durbin-Watson stat	2.112821			
Long-Run Estimates				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MVAT	-3866.576	2121.432	-1.822625	0.0841
AVAT	598.2756	1306.034	0.458086	0.6521
EVAT	5528.653	2627.190	2.104397	0.0489
C	2.539272	2711.835	0.000936	0.9993

Source: Researcher's Computation Using EViews-12 (2024)

Table 6 of ARDL long-run results, as shown in the table, reveals the coefficients and their corresponding t-statistics and probability values for each independent variable's long-term impact on revenue generation. The manufacturing value-added tax has a negative coefficient of -3866.576 with a standard error of 2121.432 and a t-statistic of -1.822625, indicating an insignificant negative impact on revenue generation in Nigeria at a 5% level (Prob. 0.0841). This suggests that, in the long run, changes in manufacturing value-added tax do not significantly influence revenue generation. On the other hand, agriculture value-added tax exhibits a positive coefficient of 598.2756 with a standard error of 1306.034 and a t-statistic of 0.458086, indicating an insignificant impact on revenue generation in Nigeria (Prob. 0.6521). This implies that an increase in agriculture value-added tax tends not to enhance the long-term value of revenue generation while in contrast, the variable education value-added tax shows a positive coefficient of 5528.653, with a standard error of 2627.190 and a t-statistic of 2.104397, which is significant (Prob. 0.0489). This finding underscores the positive long-term impact of education value-added tax on revenue generation, suggesting that improvements in the collection of education value-added tax considerably benefit the dependent variable.

The R-squared value of 0.979330 indicates that the model explains about 97.98% of the variation in government revenue. The adjusted R-squared value of 0.940287 suggests that the model's explanatory power does improve with the addition of more variables. The F-statistic of 25.08350, with a probability of 0.000015, is significant, indicating that the overall model is statistically significant. The Durbin-Watson statistic of 2.844493, which is more than 2, suggests no positive autocorrelation in the residuals, ensuring the independence of observations.

More so, the hypothesis that $\mathbf{H_{01}}$**:** There is no significant impact of manufacturing value-added tax on revenue generation in Nigeria is accepted given that the value of 0.0841 is greater than a 5 percent level of significance. This implies that manufacturing value-added tax does not have a significant impact on revenue generation. While the hypothesis stated $\mathbf{H_{02}}$**:** There is no significant impact of agriculture value added tax on revenue generation in Nigeria. Is accepted given the value of 0.6521 is greater than a 5 percent level of significance. This implies that agricultural value-added tax does not have a significant impact on revenue generation. In contrast, the hypothesis that stated $\mathbf{H_{03}}$**:** There is no significant impact of education value added tax on revenue generation in Nigeria. is rejected given the value of 0.0489 is less than a 5 percent level of significance. This implies that education value-added tax has a significant impact on revenue generation in Nigeria.

Post-Estimation Checks (ARDL Diagnostic Test)

The results from the ARDL diagnostic checks captured in Table 6 are crucial for validating the robustness and reliability of the regression model that investigates the Impact of value-added taxes on revenue generation in Nigeria. These post-estimation tests assess various assumptions underlying the ARDL regression analysis, ensuring that the model's inferences are statistically sound.

Table 7: Results of DOLS Diagnostic Checks

Tests		Outcomes	
		Coefficient	**Probability**
Breusch-Godfrey-Serial-Correlation Test	F-stat.	0.179162	0.8375
Heteroscedasticity-Breusch-Pagan-Godfrey Test	F-stat.	0.307229	0.9700
Normality Test	Jarque-Bera	0.336112	0.8453
Linearity	F-stat.	0.880055	0.3727

Source: Author's Computation Using EViews-12 (2024)

Table 7 is the Breusch-Godfrey Serial Correlation LM Test checks for autocorrelation in the residuals of the regression model. Autocorrelation occurs when residuals are not independent of each other, which can lead to inefficient estimators and biased standard errors. The outcome of this test, with an F-statistic of 0.179162 and a probability of 0.8375, suggests that there is no significant serial correlation in the model. A high p-value indicates that the study fails to reject the null hypothesis of no serial correlation, thus confirming that the residuals of the model are independent across time, which is a desirable property in time series analysis. Also, the Heteroscedasticity Breusch-Pagan-Godfrey Test is used to detect the presence of heteroscedasticity, a condition where the variance of the errors is not constant across all levels of the independent variables. Heteroscedasticity can render the standard errors inaccurate, leading to unreliable hypothesis tests. The test yields an F-statistic of 0.307229 with a probability of 0.9700, indicating that there is no significant evidence of heteroscedasticity within the model. This means that the variance of the error terms is constant, allowing for confidence in the estimated standard errors and the statistical tests that rely on them.

Also, the normality test, specifically the Jarque-Bera test, is employed to determine whether the residuals of the model are normally distributed. The normality of residuals is an important assumption, as it underpins the validity of various statistical tests, including the t-tests on the estimated coefficients and the F-test on the overall model. The Jarque-Bera statistic is 0.336112 with a probability of 0.845307, which indicates that the residuals are normally distributed. With a high p-value, the null hypothesis that the residuals are normal cannot be rejected, satisfying another critical assumption of the classical linear regression model. Finally, the Linearity Test checks if the relationship between the sectoral value-added tax and revenue generation model is correctly specified as linear. The F-statistic for the linearity test is 0.880055 with a probability of 0.3727 This result implies that there is no significant evidence against the linearity assumption of the model. Hence, the linear specification of the relationship between the sectoral value-added tax indicators and revenue generation appears to be appropriate.

Discussion of Findings

The ARDL long-run results provide a detailed examination of the impact of different types of value-added taxes on revenue generation in Nigeria. The coefficients, standard errors, t-statistics, and probability values offer insights into the significance and direction of these impacts as the coefficient for manufacturing value-added tax indicates an insignificant negative impact on revenue generation at the 5% level. In the long run, changes in MVAT do not significantly influence government revenue. This finding did not align with the work of Mukolu

and Ogodor (2021) that the value of VAT had a positive significant impact on economic growth (GDP) in Nigeria.

Also, agriculture value-added tax exhibited a positive coefficient but an insignificant impact on revenue generation. Despite the positive coefficient, the increase in AVAT does not significantly enhance long-term revenue generation. This result was in contrast to findings by Musa *et al.,* (2023). Tax has a statistically significant impact on Nigeria's income generation. The coefficient for education value-added tax had a significant positive long-term impact on revenue generation. It also aligns with more recent studies by Aminu (2020) that education tax and investment in human capital have positive and significant effects on the growth of the Nigerian economy

Conclusion and Recommendations

In conclusion, the investigation revealed through ARDL results findings highlighted the varying impacts of different VAT types on government revenue and underscored the importance of focusing on sectors with the potential for significant contributions. The results suggest that while the manufacturing and agricultural sectors are essential, their contributions to VAT revenue are currently limited by various factors. However, the education sector stands out as a promising area for revenue generation through effective VAT implementation. Thus, the paper recommended the following.

1. Considering the negative and insignificant impact of manufacturing value-added tax on revenue generation in Nigeria, Federal Ministry of Finance and Federal Inland Revenue of Nigeria should provide incentives for manufacturers and design a mechanism for effective collection of manufacturing value-added tax for improve revenue generation.
2. Also, based on the positive but insignificant impact of agricultural value-added tax on the revenue generation Nigeria, the Federal Ministry of Agriculture and Federal Inland Revenue of Nigeria Encourage the registration and documentation of agricultural activities to bring more participants into the formal tax system for improved revenue generation in Nigeria.
3. Finally, considering the positive and significant impact of education value-added tax on the revenue generation Nigeria Federal Ministry of Education and Federal Inland Revenue of Nigeria should implement robust mechanisms for the efficient collection of EVAT, ensuring that private educational institutions contribute their fair share for increased revenue generation in Nigeria.

References

Adegbite, T. A & Fasina, H. T. (2019). Taxation and revenue generation in Nigeria. *Accounting and Taxation Review*, 3(1): 82-92

Aminu, A. (2020). The impact of education tax and human capital investment on Nigeria's economic growth. *Caleb International Journal of Development Studies*. https://doi.org/10.26772/cijds-2020-03-02-05.

Amory, O.M. (2019). Impact of tax revenue on economic growth in Nigeria. *European Journal of Business and Management*. https://doi.org/10.7176/ejbm/11-24-02.

Anthony Kwanti, A. & Dauda, H. (2022). Impact of value-added-tax (VAT) on the economic growth of Nigeria. *International Journal of Accounting and Finance, 1*(2), 169-181.

Awa, F. N. and Ibeanu, R. I. (2020). Impact of tax revenue on economic development in Nigeria (1997- 2018). *European Journal of Accounting, Auditing and Finance Research*. 8(7), 18-32.

Ayonete, S. (2023). Economic development in Nigeria: Does value-added tax matter? *Research Journal of Business and Economic Management*. https://doi.org/10.31248/rjbem2022.088.

Cyril, U., Maduabuchi, A., & Okechukwu, A. (2023). Education tax effect on firms' value of consumer products industries in Nigeria. *IIARD International Journal of Economics and Business Management*. https://doi.org/10.56201/ijebm.v8.no4.2022.pg36.48.

Duarte, P. G. (2017). Frank P. Ramsey (1903–1930). In *Palgrave Macmillan UK eBooks* (pp. 649–671). https://doi.org/10.1057/978-1-137-41233-1_29

Efuntade, A. (2020). Value added tax and its effect on revenue generation in Nigeria. *Kampala International University Interdisciplinary Journal of Humanities and Social Sciences*. https://doi.org/10.59568/kijhus-2020-1-2-23.

FIRS (2024). *Simplifying tax, maximizing revenue*. https://www.firs.gov.ng/firs-organizatio n/goals

Gatawa, N., Aliero, H., & Aishatu, A. (2016). Evaluating the impact of value added tax on the economic growth of Nigeria. *Journal of accounting and taxation, 8*(1), 59-65. https://doi.org/10.5897/JAT2016.0226.

Ikechukwu, O., Christopher, E., Justice, A., & Osaremen, E. (2021). Direct taxes and income redistribution in nigeria. gatr global. *Journal of Business Social Sciences Review*. https://doi.org/10.35609/gjbssr.2021.9.2(8).

Ikhatua, J., & Ibadin, P. (2019). Tax revenue effort in Nigeria. *Accounting and Finance Research*. https://doi.org/10.5430/AFR.V8N1P103.

Luqman, O. (2014). The impact of value added tax on revenue generation in Nigeria. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2513207.

Mukolu, M., & Ogodor, B. (2021). The effect of value added tax on economic growth of Nigeria. *Journal of Business Management*. https://doi.org/10.47310/ IARJBM.2021. V02I01. 029.

Musa, A., Abdullahi, A., Garba, A., Badamasi, H., & Abdullahi, A. (2023). Tax revenue effects on government revenue generation in Nigeria. Gusau. *Journal of Economics and Development Studies*. https://doi.org/10.57233/gujeds.v3i1.20.

Oghuma, R. (2017). Value added tax and economic growth in Nigeria. *Research Journal of Finance and Accounting, 8*(1), 108-115.

Oladipo, O., Iyoha, F., Fakile, S., Asaleye, A., & Eluyela, F. (2019). Do government taxes have implications on manufacturing sector output? evidence from Nigeria. *Journal of Management Information and Decision Sciences.*

Olaoye, C., & Atilola, O. (2018). Effect of e-tax payment on revenue generation in Nigeria. *Journal of Accounting Business and Finance Research, 4*(2), 56–65. https:// doi.org/10. 20448/20 02.42.56.65.

Orisadare, M. A., & Fadare, K. (2022). The effect of Value Added Tax on Economic Growth of Nigeria, *African Journal of Economic Review*, 10(1),158-169

Saez, E., & Stantcheva, S. (2018). A simpler theory of optimal capital taxation, *Journal of Public Economics*, *162*, 120–142. https://doi.org/10.1016/j.jpubeco.2017.10.004.

Stephen, U., & Augustine, M. (2019). Value added tax administration and the Nigeria economy. *World Journal of Innovative Research*. https://doi.org/10.31871/wjir.5.6.16.

Stiglitz, J. E. (2015). In praise of frank ramsey's contribution to the theory of taxation. *The Economic Journal*, *125*(583), 235–268. https://doi.org/10.1111/ecoj.12187

APPENDIX 1
DATA FOR REGRESSION

YEAR	REV	MVAT	AVAT	EVAT
1990	98.1	NA	2.0	NA
1991	101.1	NA	1.21	NA
1992	190.5	NA	0.12	NA
1993	192.8	2.14	0.21	2.01
1994	201.91	2.52	0.35	2.31
1995	459.99	6.3	0.79	5.65
1996	523.6	10.1	1.36	9.16
1997	582.8	4.47	0.72	4.15
1998	463.6	11.67	1.62	10.83
1999	949.2	14.57	2.14	13.62
2000	1906.2	18.9	3.10	17.57
2001	2231.6	29.3	4.61	25.69
2002	1731.8	32.7	5.32	31.4
2003	2575.1	38.77	4.86	37.09
2004	3920.5	49.32	6.71	44.43
2005	5547.5	56.96	4.32	54.38
2006	5965.1	70.09	8.71	63.13
2007	5727.51	97.62	12.13	87.87
2008	7866.6	121.43	61.14	108.94
2009	4844.6	149.81	32.83	135.8
2010	7303.7	170.15	45.42	153.93
2011	11116.8	202.16	35.13	192.93
2012	10654.7	221.05	27.92	233.06
2013	9759.8	236.31	22.71	279.35
2014	10068.9	250.85	31.07	244.34
2015	6912.5	232.35	43.89	17.80
2016	5616.4	256.91	91.52	186.84
2017	7444.8	326.81	47.74	224.22
2018	9544.3	378.73	54.40	238.56
2019	9819.8	382.12	58.19	395.54
2020	8569.2	474.83	91.92	459.51
2021	10343	648.08	82.54	687.48
2022	12586.5	527.42	396.82	705.73
2023	10499.6	1104038.19	83474.29	1107454.68

Sources: Federal Inland Revenue (2023) and Central Bank of Nigeria (2023)