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Value Added Tax (VAT) and Manufacturing Output in Nigeria: An Empirical Analysis

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Abstract

The study examined the trend pattern of Value Added Tax revenue and manufacturing output in Nigeria; it also determined the causal link between the VAT revenue and manufacturing output in the country and estimated the magnitude of the impact of VAT on manufacturing output in Nigeria. These were to empirically investigate the impact of Value Added Tax on manufacturing output in Nigeria. Four macroeconomic variables were used. The variables are Manufacturing output, Value Added Tax (VAT), Company Income Tax (CIT), and Petroleum Profit Tax (PPT). Data were sourced from the Central Bank of Nigeria Bulletin and the Federal Inland Revenue Service. Data collected were analyzed using tables, graphs, the Autoregressive Distributed Lag (ARDL) method, and the Granger Causality test. The result from the trend pattern analysis showed that VAT and manufacturing output moved in the same direction. Also, correlation coefficient analysis revealed a strong and positive relationship. Granger causality test concluded bidirectional causality between VAT and manufacturing output. The estimates from the ARDL revealed that VAT had a positive and statistically significant effect on manufacturing output in the short run (t= 29, p 0.1) in the country. The study therefore concluded that Value Added Tax had a positive effect on Manufacturing output in Nigeria.

Keywords: Manufacturing Output, Macroeconomic Variables, Autoregressive Distributed Lag (ARDL), Value Added Tax (VAT), Causality.

1 Introduction

The role of an efficient tax system in economic growth cannot be over-emphasized. Revenue generation through taxation has been a major source of finance for the government in discharging its infrastructural development duty to the populace (Ogbonna and Ebimobowei, 2012). Taxation is an essential tool of fiscal policy used by the government to influence economic activities to achieve macroeconomic goals in any given economy. Governments all over the globe are duty-bound to provide basic infrastructure for their people. As such both developed and developing economies rely majorly on taxation as revenue sources to discharge their traditional functions vis-a-vis maintenance of law and order, defense against external

aggression, provision of roads, trade, and business regulations to ensure socio-economic stability (Appah and Eze, 2013, Oguejiofor et al., 2024).

Since taxation has been identified as an important determinant of economic growth and development, most countries look for ways to boost their revenue base. As a result, these moves, motivated numerous countries to introduce Value Added Tax on goods and services (Onwuchekwa and Aruwa 2014, Abere and Abu 2023). Value Added Tax is defined as a consumption tax imposed at each stage of a consumption chain and borne by the final consumer of the commodities. It was first introduced as a tax policy tool in France in 1954. Since then, many other countries have followed suit by adopting Value Added Tax as an effective tax policy instrument. For example, Value Added Tax has been introduced in African countries: Guinea, Kenya, Madagascar, Benin Republic, Coted'Ivore, Mauritius, Togo, Senegal, and Nigeria. Value Added Tax has been adjudged as an important contributor to government revenue in these countries (Ajakaye 2000; Shalizi and Square 1988; Adereti Adesina and Sanni, 2011)

In Nigeria, Value Added Tax was first implemented in 1994 to replace Sales tax. According to Ayafor (1996), the reasons why sales tax was replaced by Value Added Tax are summarized as follows: The sales tax base in Nigeria was narrow and targeted only locally manufactured goods. The VAT rate was fixed at 5 percent in 1993 by the Decree No 102 of 1993 provision. The Value Added Tax rate was however adjusted upward to 7.5 percent in compliance with the Finance Act 2019. The VAT rate of 7.5 percent was fully implemented from February 2020 till date. All goods and services whether manufactured locally or imported except those explicitly excluded by the VAT Act attract a VAT levy of 7.5 percent.

The introduction of VAT in 1993 was a measure to meet the increasing need for government revenue in Nigeria. Its implementation started in 1994 and this has witnessed a tremendous success. For example, Federal Inland Revenue Service, (FIRS) reports show that VAT increased from 8.20 billion naira to 163.80 billion naira in 2004. It also Rose to 616.9 billion naira in 2014. It showed a rising trend till 2019 when it stood at 1.7trillion naira. However, the growth rate of manufacturing output to GDP was not specific. In 1994, it increased from 7.08 billion dollars to 14.75 billion dollars in 2004, 55.3 billion dollars in 2014, and 64.41 billion dollars in 2021. Although both VAT and manufacturing output displayed uptrend movement but not at the same rate. Therefore, there's a need to empirically investigate this relationship.

Also, findings from empirical studies into the relationship between VAT and economic growth including manufacturing output show mixed and inconclusive results. Some studies provide empirical evidence that VAT increases industrial prosperity (Ayoub and Mukherjee, 2019; Demi et al, 2021; Inimino et al 2018; Lan et al, 2020; Ma et al 2022; Nasiru et al 2016; Omodero and Eriable 2022; Abiola 2024). These findings lay more emphasis on the judicious use of VAT to provide infrastructural facilities to aid the industrial prosperity. On the other hand, numerous studies provide empirical facts to show that VAT is detrimental to economic growth and industrial prosperity by causing inflation and other economic problems (Alavuotunk et al, 2019; Bansal and Abdulla, 2020; Kalini, 2022; Malkina, 2021; Sawar et al, 2021; Stoilova, 2017; Timuno and Eita, 2021). Their argument is based on the fact that VAT burdens are transferred to final consumers which results in inflation and its associated economic problems such as low

investment, and unemployment among others. On this note, this study is intending to use recent data and novel technique to re-investigate the trend and pattern of VAT revenue and manufacturing output in Nigeria.

Apart from the studies by Omodero and Eriable, (2022) and Eniekezimene et.al (2024) to our knowledge there is no specific study on the impact of VAT on manufacturing output in Nigeria, hence this study. Based on the foregoing analysis this study is to attain the following objectives: to examine the trend pattern of VAT revenue and manufacturing output in Nigeria; to determine the causal link between the VAT revenue and manufacturing output in the country and to estimate the magnitude of the impact of VAT on manufacturing output in Nigeria. The study period of this research work spans through 1994 and 2023. The reason for choosing 1994 as the starting period is because VAT collection started in Nigeria in 1994. The rest of this paper is as follows: the second section captures the literature review. The third section contains the research methods and technique of specifying the model for the study, while, section four reveals the results analysis from the econometric technique and the last section includes the summary, the policy recommendation, and the conclusion.

2. LITERATURE REVIEW

This section discusses the taxation concept and theoretical and empirical literature review on tax revenue and economic growth including manufacturing output.

2.1 Taxation

The concept of taxation is a very interesting one and like many events in the affairs of men, has undergone several modifications and changes. Taxation is now comparatively very sophisticated in most of the world. In Nigeria, some of the types of taxation we have include personal income tax (Pay-As-You-Earn), companies' income tax, capital gain tax, sales tax, petroleum profit tax, and modified value-added tax. There is one element, that remains very clear, taxation, in every sense, is a tool of economic information. Governments, the world over, have always found ways of imposing various levies (Taxes) on their subjects. This is done in a view of raising revenue for its expenditure.

Tax reduction or tax holiday may, on the other hand, be granted to certain sectors to stimulate economic growth and also formulate tax laws to effectively prescribe penalties for tax evasion to ensure compliance. It should be noted that an increase in government spending naturally implies the opposite (i.e., a reduction) in private spending of the citizens. The corollary is also true. Hence, taxation is a method of transferring resources from the private sector or effecting a reshuffling within different parts of the public and private sectors. Though there are other methods by which the government generates money (for instance through currency devaluation, raising of loans, or charging for goods and services they produce or provide), taxation is often the most important, dependable, and regular source of their revenue. This is why it constitutes a veritable instrument for shaping and directing economic activities.

Increased taxation withdraws money from circulation in the private sector. On the other hand, reduced tax or tax abolition for certain areas automatically increases or stimulates activities or

investment in the areas attended with the attendant benefits. According to Anyanwu (1997), a tax is a compulsory levy imposed by the government on individuals, companies, goods, and services to raise revenue for its operations and to promote social equity through the redistribution of income effect of taxation. In line with this frame of thought, taxation is a source of government revenue by which individuals and corporate bodies are mandatorily required to pay a certain proportion of their earnings to the government for the course of development.

In addition, Bhatia (1976) defined tax as a compulsory levy payable by an economic unit to the government without any corresponding entitlement to receive a definite and direct benefit from the government. Note that the word direct here does not mean a price paid by the taxpayer for any definite service rendered or a commodity supplied by the government. Rather it means that the benefits received by taxpayers from the government are not related to or based upon the tax paid by the taxpayers. This in effect implies that tax is a generalized exaction, which may be levied on one or more criteria upon individuals, groups, or legal entities. Chartered Institute of Taxation of Nigeria (2002) defined tax as an enforced contribution of money to the government under a defined authorized legislation.

Appah (2004) defined tax as 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 wellbeing of the society". Tax is a mandatory commitment to the public treasury made by businesses, private citizens, and other entities in conformity with the laws. Levy has two primary roles. Taxation generates a significant and consistent revenue stream to match the government's fiscal necessities. The legally required phenomenon of taxation with a broad impact is an essential priority for the authority to galvanize monetary capacity from the financial system promptly and adequately. Taxation is also used to maintain economic stability. The state controls the behavior of both companies and people through taxation, guiding consumption, and regulating production (Nguyen, 2019). Wikipedia defined tax as a "financial charge or other levy imposed upon a taxpayer (an individual or legal entity) by a state or the functional equivalent of a state such that failure to pay is punishable by law".

Going by the definitions of tax, Nzotta (2007) identified four key issues that must be understood for taxation to play its functions in any society. First, a tax is a compulsory contribution made by the citizens to the government and this contribution is for general common use. Secondly, a tax imposes a general obligation on the taxpayer. Thirdly, there is a presumption that the contribution to the public revenue made by the taxpayer may not be equivalent to the benefits received. Finally, a tax is not imposed on a citizen by the government because it has rendered specific services to him or his family

2.2 Theoretical Review

Benefit Theory

This theory holds that individuals should be taxed in proportion to the benefits they receive from the governments in public services and that taxes should be paid by those people who receive the direct benefit of the government programs and projects out of the taxes paid. It was developed in the seventeenth century by English philosophers Thomas Hobbes (1588-1679) and John Locke

(1632-1704), and Dutch jurist Hugo Grotius (1583-1645) (Saleemi, 2005). This theory has been subjected to severe criticism on the following grounds: 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 we know, is a compulsory contribution made to the public authorities to meet the expenses of the government and the provisions of general benefit. There is no direct substitution 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. Thirdly, if we apply this theory in practice, then the poor will have to pay the heaviest taxes because they benefit more from the services of the state. This is against the principle of justice (Saleemi, 2005).

Ability-to-Pay Theory

This theory originates from the sixteenth century. It was scientifically extended by the Swiss philosopher Jean Jacques Rousseau (1712-1778), the French political economist Jean-Baptiste Say (1767-1832), and the English economist John Stuart Mill (1806-1873). This theory holds that taxation should be levied according to an individual's income or ability to pay and is the basis of progressive tax as the tax rate increases with the increase of the taxable amount (Jones &Rhoades, 2011). This theory is indeed the most equitable tax system since people with greater income or wealth and who can afford to pay more taxes should be taxed at a higher rate than people with less individual income tax and has been widely used in industrialized economics. However, there is no solid approach for the measurement of the equity of sacrifice in this theory, as it can be measured in absolute, proportional, or marginal terms. VAT does not tie in with this theory because the amount of VAT on a particular good will be the same for everyone, however much they earn. VAT is thus regressive since it represents a smaller proportion of a person's income as their income rises (Jones & Rhoades, 2011).

Equal Sacrifice Theory

Another suggestion to make a tax satisfy the theory of justice is that we take into consideration the sacrifice entailed by the taxpayer. The equal-distribution theory also known as Equal sacrifice or Proportionate theory holds that income, wealth, and transaction should be taxed at a fixed percentage; that is, people who earn more should pay more taxes but will not pay a higher rate of taxes. It was suggested by J. S. Mill and some other classical economists in order to satisfy the idea of justice in taxation (Musgrave & Musgrave, 1989). These economists believed that if taxes are levied in proportion to the incomes of the individuals, it will extract equal sacrifice. Thus, equal sacrifice can be measured as

(i) each taxpayer surrenders the same absolute degree of utility that s/he obtains from her/his income, or (ii) each sacrifices the same proportion of utility she/he obtains from her/his income, or (iii) each gives up the same utility for the last unit of income; respectively. Modern economists, however, differ with this view. They assert that when income increases, the marginal utility of income decreases. The equality of sacrifice can only be achieved if the persons with high incomes are taxed at higher rates and those with low incomes at lower rates. They favor a progressive system of taxation, in all modern tax systems (Musgrave & Musgrave, 1989). The

Cost-of-Service Theory. Some economists believe that if the state charges the actual cost of the service rendered from the people, it will satisfy the idea of equity or justice in taxation. The cost-of-service theory can no doubt be applied to some extent in those cases where the services are rendered out of price and are a bit easy to determine, e.g., postal, railway services, supply of electricity, etc., etc. But most of the expenditure incurred by the state cannot be fixed for each individual because it cannot be exactly determined, for instance, the cost of service of the police, armed forces, judiciary, etc., to different individuals. Dalton has also rejected this theory on the ground that there is no quid pro qua in a tax (Kaplow, 2010).

2.3 Empirical Review

Aliyu and Mustapha (2020) carried out a study on the impact of tax revenue on economic growth in Nigeria (1981-2017). ARDL bound test revealed that the variables are cointegrated while ARDL long-run estimation indicated that petroleum profit, value-added tax, and government domestic debt are significant and positively related to GDP. Asaolu et al. (2018) carried out a study on tax revenue and economic growth in Nigeria, the results of the study showed that VAT and Custom and Excise Duty had a significant relationship with economic growth ($p<0.05$), while CIT has a negative significant relationship with economic growth ($P<0.05$). The study showed that PPT had no significant relationship with economic growth. The study concluded that the role of taxation in a nation's building is irreplaceable. Taxation remains a strong socio-political and economic tool for economic prosperity.

Achor and Ekundayo (2016) revealed that value-added tax had a significant impact on real Gross Domestic Product. Ibanichuka et al. (2016) showed that revenues collected by the federal government through CIT, VAT, and CED have a positive relationship with the Human Development Index. Based on the findings, it was concluded that revenues collected by the federal government through company income tax, value-added tax, customs, and excise duties help to improve human development. In a similar study, Abiola (2024) investigated the correlation between Nigeria's manufacturing sector, Value Added Tax, Government Capital Expenditure and Customs and Excise Duty for the period of 1981 to 2022. The study revealed a positive and significant relationship between manufacturing output, Government Capital Expenditure and Value added Tax.

Looking at the broader scope, Abere and Abu (2023) focused their study on 10 ECOWAS countries to investigate the nexus between value added tax and inflation on manufacturing sector productivity in ECOWAS countries between 2000 to 2022. Using Panel ARDL model and Panel GMM. Their findings showed exchange rate, inflation and value added tax coefficients had a relationship with manufacturing productivity. The affirmed the current depreciation of most ECOWAS currencies to US Dollar discourage firm productivity.

Emily (2024) examined the impact of fiscal policy indicator on the manufacturing sector in Nigeria between 1987 to 2022 using Auto-regressive Distributed Lag (ARDL), the results indicate that recurrent expenditures, oil taxation, and public domestic debt have a significant on manufacturing industrial output while government capital expenditure, non-oil taxation and public external debt have an insignificant effect on manufacturing industrial output in Nigeria. In

a related study, Oguejiofor et al., (2024) investigated the dynamic of fiscal policy measure on manufacturing sector growth in Nigeria period of 1981 to 2021 using Auto-regressive Distributed Lag (ARDL). The findings showed a negative and significant relationship between company income tax, tariff, and manufacturing output growth rate while a positive and significant relationship exist between government expenditure and manufacturing output growth rate. Obaretin and Uwaifo (2020) looked into the influence of Value Added Tax on Nigerian industrial prosperity from 1994 to 2018. The repeated measures configuration was used in the analysis. The findings revealed that VAT had a significant and favorable effect on Nigeria's economic progress.

According to Bansal and Abdulla (2020), the VAT implementation can significantly raise tax receipts, allowing the authorities to spend more on innovation to enhance economic growth. Demi et al. (2021) confirmed that VAT influenced nominal GDP indirectly and constructively and that there was a significant connection between VAT income and GDP growth rate, with virtually a 10% modification in VAT earnings causing a rise of at least 1.03% in the GDP growth rate. Even so, Guo and Shi (2021) demonstrated that the VAT decline assisted China in recovering from the latest COVID-19 zoonotic disease. According to Guo and Shi (2021), VAT relieves fiscal pressures, and VAT reductions aid in the recovery from an economic recession. Ma et al. (2022) found that converting business taxes to VAT curtailed the tax pressure on firms in numerous districts of China

Sarwar et al. (2021) believe that despite the anticipation that VAT deployment is beneficial to the government's recovery from an economic slump because more income will be accessible, some problems could occur as a result of the VAT. Regrettably, VAT causes inflation of consumer costs (Sarwar et al., 2021). In Saudi Arabia, Sarwar et al. (2021) discovered that the implications of labor became bad after VAT, but the consequence of investment and financial progression became substantial by Vision 2030 rapid industrialization. The price of crude coefficients was significant and harmful for both return and volatility. Capital accumulation and bilateral trade had different outcomes; positive shocks had negative signs. Trade liberalization, on the other hand, had a major and beneficial quotient after Perception 2030. Santiago and Morozum (2021) investigated whether, from the perspective of OECD countries, a revenue-neutral uptick in VAT, counterbalanced by a reduction in income taxes, could have various impacts on long-run expansion contingent upon how the VAT is created. The analysis found that a revenue-neutral increase in VAT enhanced advancement when it was raised through an increase in C-efficiency, but not when it was raised through an increase in the standard VAT rate, which is tried to apply to the majority of taxed consumption.

Kristjansdottir (2021) wondered if higher VAT affected tourism demand in Europe. The results suggested that VAT growth did not affect tourist inflows to Europe. Timuno and Eita (2021) used the Autoregressive Distributive Lag method to evaluate the consequences of fiscal policy on sectoral total factor production (TFP) increase in Botswana between 1984 and 2016. They concluded that the value-added tax and the non-mining taxation reduced Output growth throughout all areas of the economy. Kalinin (2022) postulated a justification for the amount of VAT payouts in 2019 increasing at a quicker speed than the rapid expansion in value created.

Schoeman et al. (2022) identified that while modifications in the VAT rate do not have a serious influence on taxpayer enrollment choices, the amplitude of the adjustment in the VAT rate could be impactful on signing up adoptions, whether of obligatory or spontaneous certification.

2.4 Theoretical Framework

Theoretical frameworks that explain the essence of collecting tax are numerous. They include benefit theory, ability to pay theory, equal sacrifice theory, and cost service theory. All these have been critically examined in the theoretical review in chapter two of this study. Actually, this study anchors on the benefit theory and cost service theory. These two theories explain the essence of collecting tax on the service rendered by the government. For example, benefit theory emphasizes the benefits people will enjoy from what they pay to the government. On the other hand, cost service theory also explains the fact that people are paying for the service the government renders to them.

All the same, both theories recognize the fact that the government needs the funds to finance infrastructural facilities that will be of benefit to everyone. Besides, the government uses the tax revenue and properties of the populace. If the tax revenue, including VAT, is judiciously used, it will provide an enabling environment for the manufacturing sector to thrive.

3. MODEL SPECIFICATION AND ESTIMATION TECHNIQUE

Following the study by Omodero and Eriabie (2022) with a slight adjustment to achieve the objective of this study, the functional relationship between taxes and the manufacturing sector output is expressed below:

$$MO_t = \alpha_0 + \alpha_1 VAT + \alpha_2 CIT + \alpha_1 PPT + u_t \quad (1)$$

In equation (1) MO is the output in the manufacturing sector, VAT is value-added tax, CIT is the company income tax and PPT represents petroleum profit tax. Where 't' denotes the period of observation, α_0 *is the constant term* and u_t is the error term. Applying log to the equation above, then it becomes

$$mo_t = \alpha_0 + \alpha_1 InVAT + \alpha_2 InCIT + \alpha_1 InPPT + \varepsilon_t \quad (2)$$

In equation (2) mo_t is the log of output in the manufacturing sector and ε_t is In (u_t). Before the estimation of the long-run and short-run behavior using the Auto-regressive Distributed Lags (ARDL), the study examined the stationarity properties of the series using the Augmented Dickey-Fuller (ADF) approach. The ADF equation is given as:

$$\Delta Y_t = \delta_1 + \delta_2 t + \Phi Y_{t-1} + \sum_{i=1}^{m} \beta_i \Delta Y_{t-i} + v_t \quad (3)$$

To determine the unit root property of the data involves estimating equation (3), where 't' is the period observation, Y is the time series underestimation, δ_1 and δ_2 are the constant and slope respectively, Φ is the drift parameter, Δ is the first difference operator and v_t is the noise error term. The error term is assumed to be uncorrelated and ADF follows an asymptotic distribution. The critical values are used to determine the level of the stationary process. The null hypothesis

Φ = 0, indicates that the time series under consideration is non-stationary, and the alternative hypothesis if $\Phi < 0$ shows that the time series is stationary

Based on the outcome of the unit root test, the study proceeds to estimate the long-run relationship using the ARDL which shows the short-run dynamic behavior and the long-run equation. Then ARDL mode is formulated below:

$$\Delta y_t = \alpha_1 + \delta_2 t + \sum_{i=1}^{m} \beta_i \Delta y_{t-i} + \sum_{j=0}^{q} w_j \Delta x_{t-j} + \theta_1 y_{t-i} + \theta_2 x_{t-i} + v_t \quad (4)$$

In equation (4), α_1 is the drift coefficient and δ_2 is the trend coefficient, while v_t represents the white noise error term. The short-run coefficient are β_i and w_j while the long-run coefficient are θ_1 and θ_2.

where:

y_t = manufacturing sector output

x_t = VAT revenue and other control variables

v_t = error term

4. EMPIRICAL RESULTS

This section contains data analysis and results of the impact of VAT on Manufacturing Output in Nigeria between the period of 1994 and 2023. Section 4.1 presents the trend pattern analysis of VAT revenue and Manufacturing output in Nigeria. Section 4.2 examines the nature causal link between VAT revenue and manufacturing output, while, section 4.3 estimates the magnitude of the impact of VAT revenue on manufacturing output in Nigeria.

Table 4.1 Manufacturing Output and Tax revenue (1994-2022) in Billions of Nigeria Naira

YEAR	MO	VAT	CIT	PPT
1994	370.16	7.3	12.3	42.8
1995	619.85	20.8	21.9	42.9
1996	780.48	32.5	23.1	47.5
1997	848.33	35.3	27.8	64.3
1998	838.53	37.6	33.3	24.6
1999	891.29	47.8	46.2	71.1
2000	984.08	58	53.3	334.5
2001	1146.68	91.7	69.4	407.1
2002	1358.53	108.6	89.1	234.4
2003	1635.05	136.4	114.8	438
2004	1968.56	163.3	130.8	878.6
2005	2326.31	192.7	170.2	1352.2
2006	2689.08	232.7	246.7	1349.5
2007	2913.26	312.6	332.4	1132
2008	3263.82	401.7	420.6	2060.9

2009	3406.69	481.4	600.6	939.4
2010	3578.64	564.9	666.1	1480.4
2011	4527.45	659.2	715.4	3070.6
2012	5588.82	710.6	846.6	3201.3
2013	7233.23	802.7	998.4	2666.4
2014	8685.43	802.9647	1173.491	2453.947
2015	8973.77	767.3335	1268.977	1289.961
2016	8903.24	828.1991	933.5373	1157.808
2017	10044.48	972.3484	1215.057	1520.482
2018	12456.53	1108.04	1340.329	2467.581
2019	16781.06	1189.981	1604.699	2114.268
2020	19539.55	1531.171	1275.381	1516.993
2021	25725.87	2072.85	1747.99	2008.45
2022	27508.52	2511.52	2649.19	4209.02

Source: www.firs.gov.ng

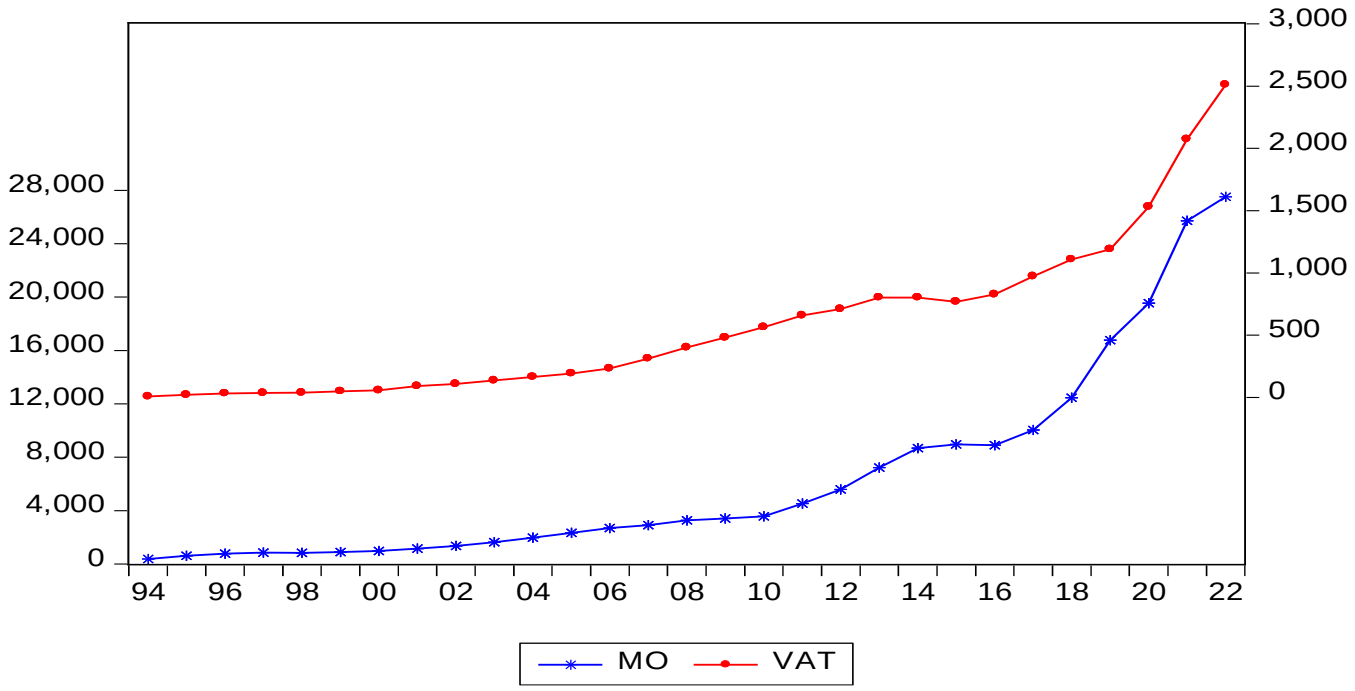

Figure 4.1 Manufacturing output and Tax revenue (1994-2022) in billions of Nigeria naira

From Table 4.1 and Figure 4.1 as shown above, manufacturing output is represented by the output produced by the manufacturing sector of the economy, while value-added tax (VAT) is represented by the addition of both import and domestic VAT revenue. They are expressed in billions of local currency (Naira). The manufacturing sector from Table 4.1 and Figure 4.1 displays an uptrend movement. In 1994, manufacturing output increased from 370.16 billion naira to 1968.56 billion naira in 2004. The uptrend in manufacturing output continued until 2015 when it fell from 8973.77 billion naira to 8903.24 billion naira in 2016. VAT also experienced upward movement until 2014 when it decreased from 802.9647 billion naira to 767.335 billion

naira in 2015. The 2014/2015 recession contributed majorly to the downtrend experienced in manufacturing output and VAT proceed in 2016 and 2015 respectively. Both VAT revenue and manufacturing output followed an upward movement till 2022. The uptrend pattern demonstrates that the Nigerian manufacturing sector is improving as a result of the introduction of new technologies and the low level of the country's VAT rate. Omodero (2020) confirmed that Nigeria's VAT rate is one of the lowest in the world. This important factor has been of immense benefit to manufacturing establishments in the country.

Table 4.2 Descriptive Statistics Result

	LMO	LPPT	LVAT	LCIT
Mean	8.037341	6.432361	5.483660	5.524590
Median	8.033841	7.108326	5.870315	5.924011
Maximum	10.15525	8.071312	7.636680	7.466222
Minimum	5.913935	3.202746	1.987874	2.509599
Std. Dev.	1.158574	1.532535	1.496615	1.578218
Skewness	0.077744	-0.903301	-0.570028	-0.409867
Kurtosis	1.959698	2.362791	2.294520	1.733906
Jarque-Bera	1.290807	4.281484	2.097001	2.654118
Probability	0.524451	0.117568	0.350463	0.265256
Sum	225.0455	180.1061	153.5425	154.6885
Sum Sq. Dev.	36.24195	63.41392	60.47609	67.25085
Observations	28	28	28	28

Source: Authors' computation (2024)

The descriptive statistics used in this study are the summary of mean, median, minimum range, maximum range, standard deviation, skewness, kurtosis, and Jarque Bera.

The descriptive statistics are employed to identify important characteristics of the data. From Table 4.2 above, it can be observed that the mean and the median of the variables are very close. Meanwhile, the proximity of the mean and median of a variable implies the variables have a normal distribution. Also, the mean and median of all the variables fall within the minimum and maximum range. The standard deviation shows that the spread of the data is minimal. Kurtosis result also reveals that the variables have a close to 3 and this implies that the data are normally distributed. Jarque Bera probability values are all more than 0,05 meaning that the data set used in this are normally distributed. The skewness result also shows that manufacturing output has a positive skewness, while, the remaining variables are negatively skewed.

4.1 Correlation Analysis

From Table 4.3 the correlation analysis result showed that the correlation among VAT revenue, manufacturing output, company income tax, and petroleum profit tax proceeds was high. Besides, all the variables in question display positive relationships with one another.

It is therefore concluded that VAT receipt and manufacturing output display a positive relationship with each other.

Table 4.3: Correlation Matrix

	MO	VAT	CIT	PPT
MO	1.0			
VAT	0.98	1.0		
CIT	0.91	0.95	1.0	
PPT	0.54	0.67	0.73	1.0

Source: Authors' computation (2024)

4.2 Unit Root Test

If time series data are stationary it could pose some difficulties in the economic data analysis result. It is therefore essential to verify the stationarity properties of time series data before its analysis. This is of great importance because it has been established in the literature that most macroeconomic time series are non-stationary and using such time series without appropriate methodologies could result in estimating spurious regression results. (Engle and Granger 1987).

To check the stationarity properties of the time series used in this work Augmented Dickey-Fuller unit root test was adopted. From Table 4.5 all the variables used in the study were stationary at first difference except LVAT which is stationary at level.

Table 4.4: Unit Root Test Result

VARIABLES	**LEVEL**	**FIRST DIFFERENCE**	**STATUS**
LMO	0.8492 (0.9928)	-4.5467 (0.0014)	I(1)
LVAT	-3.5516 (0.0141)	 ----------	1(0)
LPPT	-1.6878 (0.4404)	-5.0629 (0.0004)	I (1)
LCIT	-2.5152 (0.1231)	-5.8688 (0.0001)	I(1)

Source: Authors' computation (2024)

Table 4.5: Co-Integration Test

t- static	**Value**	**K**
F-statistic	**11.5478**	**3**
CRITICAL VALUE BOUND		
Significance levels	**Lower Bound**	**Upper Bound**
10%	**2.72**	**3.77**
5%	**3.23**	**4.35**
2.5%	**3.69**	**4.89**
1%	**4.29**	**5.61**

Source: Authors' computation (2024)

The result of the ARDL bound test for co-integration for the study is presented in Table 4.6. The result of the co-integration shows that the F-statistic of 11.5478 is greater than both upper and lower bounds critical value at a 1 percent significance level. This implies there is a presence of co-integration in our manufacturing output function. Therefore, there is a long run among the variables.

4.3 Magnitude of VAT revenue impact on manufacturing output

To determine the magnitude of VAT revenue's effect on manufacturing output, the autoregressive distributed lag (ARDL) model was adopted. The ARDL model was employed because the unit root test revealed a mixed order of integration I (0) and I (1).

The ARDL technique examined the effect of VAT revenue on manufacturing output in Nigeria both in the short run and long run. The finding revealed that VAT has a direct and statistically significant effect on manufacturing output in the short run. That is, a percentage increase in VAT proceed will lead to a 0.17 percent increase in the manufacturing output as shown in Table 4. On the other hand, findings from this study showed that VAT did not have any statistical significance on the manufacturing output in the long run. From the study, it was also found that Petroleum profit tax (PPT) had a statistically positive effect on manufacturing output in the short run. However, company income tax (CIT) had a negative and statistically significant effect on manufacturing output. In the long run, both PPT and CIT impacts were not statistically significant. The negative sign of the error correction term (-0.1231.) and its statistical significance level of 10% confirmed the existence of a long-run relationship in the model. The coefficient implied 12% of the deviation in the short run would be corrected within a year.

In general, this study confirmed that VAT has a positive impact on manufacturing output in Nigeria. This finding is consistent with the work of Omodero and Eribie, 2022; Ayoub and Mukherjee 2019; Lan et al, 2020 and Ma et al 2022.

From Table 4.8 diagnostic tests for the ARDL model indicate that the model was free from serial correlation and the model was homoscedastic. The Ramsey reset test also revealed the model was free of specification errors. Figures 4.2 and 4.3 revealed that the model is stable.

Table 4.6 Estimated Short Run and Long Run Coefficients using ARDL

Short Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(LMO(-1))	0.3155	0.1440	2.1905	0.0710
D(LVAT)	0.1286	0.0870	1.4781	0.1899
D(LVAT(-1))	0.0346	0.1309	0.2643	0.8004
D(LVAT(-2))	-0.0747	0.0973	-0.7675	0.4719
D(LVAT(-3))	0.1775	0.0619	2.8658	0.0286
D(LCIT)	-0.0493	0.0684	-0.7206	0.4982
D(LCIT(-1))	-0.0504	0.0827	-0.6102	0.5641
D(LCIT(-2))	0.1257	0.0664	1.8939	0.1071
D(LCIT(-3))	-0.3109	0.0667	-4.6625	0.0035
D(LPPT)	0.0692	0.0282	2.4541	0.0495

D(LPPT(-1))	0.0336	0.0176	1.9052	0.1054
D(LPPT(-2))	-0.0008	0.0157	-0.0525	0.9598
D(LPPT(-3))	0.046564	0.016121	2.888461	0.0277
ECT(-1)	-0.123147	0.056999	-2.160504	0.0740
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LVAT	1.419238	1.370293	1.035718	0.3403
LCIT	-0.163248	1.177050	-0.138692	0.8942
LPPT	-0.124978	0.237753	-0.525663	0.6180
C	2.683044	1.024760	2.618216	0.0397

Table 4.7 Diagnostic Tests

Breusch-Godfrey serial correlation test	3.6271 (0.1263)
Heteroskedasticity test	0.4244 (0.1394)
Ramsey Reset test	0.4285 (0.5416)

Where (.) are probabilities of the F statistic values

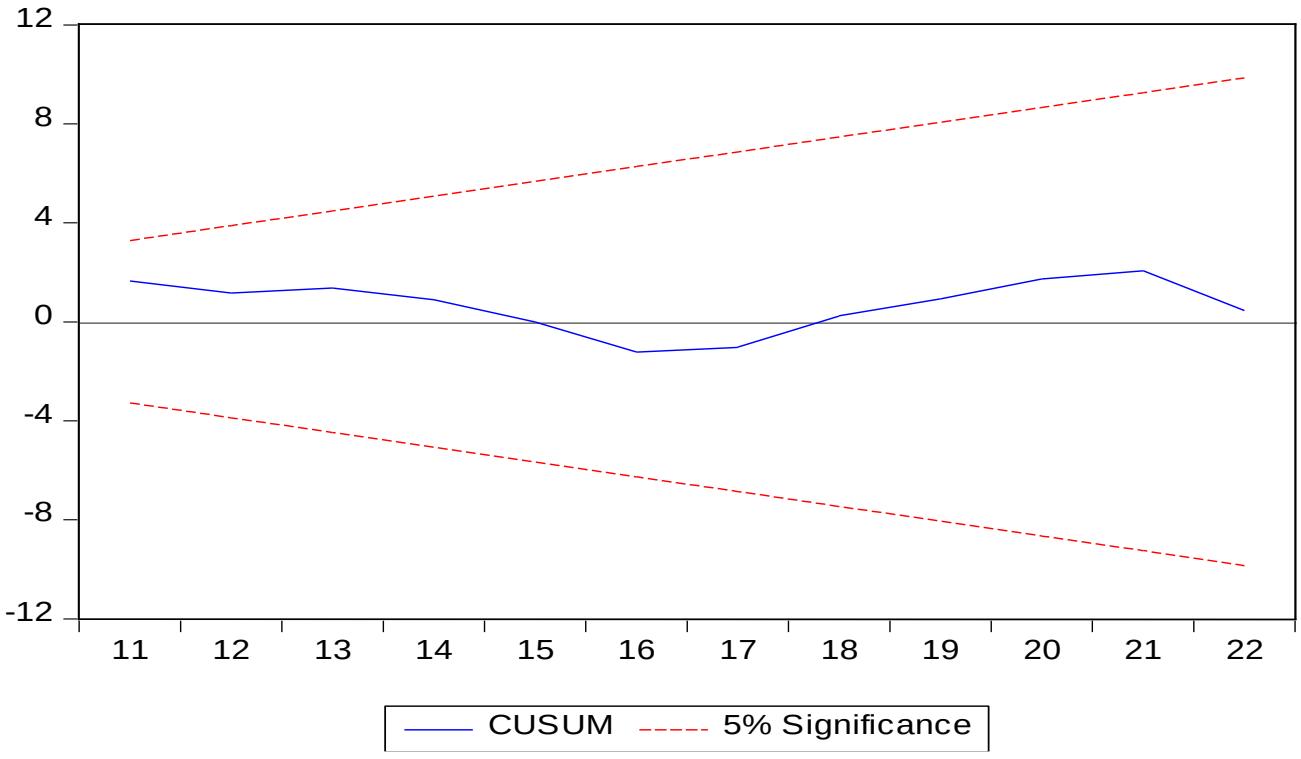

Figure 4.3 CUSUM Q Stability Test for the ARDL model

Source: Authors' Computer (2024)

5. SUMMARY, CONCLUSION AND POLICY RECOMMENDATION

This section contains the summary of the major findings, conclusion, policy recommendation on the effect of VAT revenue on manufacturing output in Nigeria from 1994 to 2021. The summary of the entire work is presented in the section 5.1, while conclusion is presented in section 5.2. Section 5.3 deal with policy recommendations.

5.1 **Summary**

The broad objective of this study is to empirically investigate the impact of VAT revenue on manufacturing output in Nigeria from 1994 to 2021. In order to achieve the broad objective of the study, specific objectives were to examine the trend pattern of VAT revenue and manufacturing output, to determine the causal link between VAT revenue and manufacturing output and to estimate the magnitude of the impact of VAT on manufacturing output in Nigeria.

In order to achieve the objectives of the study, chapter one provides the background of the study and research problem. Chapter two captures the literature review which comprises both theoretical and empirical works on the relationship between VAT and manufacturing output. The methodologies to achieve these objectives were presented in chapter three. The methodology adopted was Autoregressive Distributed Lag (ARDL) Model. The study also adopted Granger causality test unit root test and correlation coefficient analysis.

The trend analysis showed that both VAT and manufacturing output moved in the same direction until 2014 when they displayed a drastic down trend which was attributed to fall in global crude oil price and brought the country into recession in 2015 and 2016 before they steadily picked up from 2017 till date. Correlation coefficient adopted showed a strong positive relationship between VAT and manufacturing output. Granger causality test revealed the presence of bidirectional causality between VAT and manufacturing output. ARDL results showed that VAT had a positive and statistically significant impact on manufacturing output in the short run but no statistically significant relationship between VAT and manufacturing output in the long run.

5.2 Conclusion

From the result obtained, the following conclusions were revealed: First the trend pattern analysis showed that VAT and manufacturing output moved in the same direction. Also correlation coefficient analysis revealed strong and positive relationship. Secondly, Granger causality test concluded bidirectional causality between VAT and manufacturing output. Lastly, this study also concluded that VAT had positive and statistically significant effect on manufacturing output in the short run in the country. The finding from this study is consistent with work of Omodero and Eribie, 2022; Ayoub and Mukherjee 2019; Lan et al, 2020 and Ma et al 2022.

5.3 **Policy Recommendation**

In view of the findings from this study, the following policy options are recommended:

Government should ensure that supply or production process chains are technologically in order to boost VAT administration at all supply chain levels. Government should ensure judicious

utilization of VAT proceed in the provision of infrastructural facilities that can facilitate enabling environment for manufacturing to thrive. Tax authorities should provide educative training and seminars for the affected industries on how to compute and remit VAT. Illegal VAT collectors should be arrested and prosecuted so as to serve as deterrent to others.

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