

Tax Components and its Effects on Industrial Output in Nigeria

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Article DOI: 10.48028/iiprds/ijarppads.v6.i1.03

Abstract

Taxation is a major component of the fiscal policy framework of any nation with a key objective for stabilization of the economy and increasing national output to grow and expand industrial output in Nigeria. The paper's objective is to analyze the effects of tax components on industrial output in Nigeria using historical data sourced from the Central Bank of Nigeria Statistical Bulletin (CBN), National Bureau of Statistics (NBS), and Federal Inland Revenue (FIRS) spanning from 1999-2022. The paper adopted Fully modified ordinary Least Square Method of analysis. The findings highlight the varying effects of tax components on industrial output in Nigeria, company income tax showing positive but insignificant relationship, Customs & Excise Duties exerting a negative impact on industrial output with VAT positively influencing industrial output. The paper suggests that policymakers should focus on optimizing VAT policies. Also including improving tax collection mechanisms, streamlining procedures, and ensuring compliance, policymakers should review and evaluate the existing tax policies, review duty rates and trade policies by Lowering duties, particularly on essential inputs and machinery, and creating favourable trade conditions that can help mitigate the adverse effects of these duties on industrial output.

Keywords: *Taxation, Industrial Output, value-added tax, Company income tax, Customs and excise Tax*

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Background to the Study

Taxation is an important part of any country's economic progress. Taxation is used by governments to generate money, create economic stability, and achieve numerous socioeconomic goals. Taxation is the method through which governments collect funds from individuals and businesses in order to fund public expenditures and meet societal requirements. It is a key tool used by governments to generate revenue, redistribute wealth, and achieve various economic and social objectives. Taxes can be imposed on income, profits, consumption, property, and transactions (Smith, 2020). In theory, taxes are thought to have a negative link with investment and economic growth because they induce distortions in the economy (Aiyedogbon, 2023). Thus, they argue that tax policy discourages new investment and entrepreneurship by reducing work effort and skill acquisition by individuals, resulting in misallocation or distort resource allocation through their impact on saving and business investment. Taxation is an important source of government revenue in Nigeria, and it influences numerous areas of the economy, particularly the industrial sector. The industrial sector in Nigeria encompasses a wide range of activities, including manufacturing, mining, construction, and utilities. It contributes to employment generation, technological advancement, and overall economic growth. However, the sector faces numerous challenges, including infrastructure deficiencies, limited access to finance, and policy-related issues such as taxation.

Company income tax is statutorily levied on an incorporated business, the incidence and burden of the tax are generally seen to be distributed in the entire economy among participants in the production value chain. On the one end, the key relationship is that the burden of company income tax is shared between the returns to capital in the form of investor profits and the return to labour in the form of wages paid to employees. If there is a "reduction in company income tax rates, in the form of incentive, companies would accumulate capital, attract inward investment of capital and incentivize innovation" (Engen and Skinner, 2008), thereby expanding output. On the other end, increase company tax rates are detrimental to investment expansion and distortive to productivity and reduce gross domestic product per capita. The two extreme views of the impact of taxation on productivity have attracted several debates in both developed and developing economies (Agenor, 2005).

Customs duties in Nigeria increase the cost of imported goods, raising production costs for industries reliant on imports. However, they can stimulate domestic production by making imported goods more expensive. Excessive customs duties can lead to smuggling activities and the growth of the informal economy. Customs duties and excise taxes are important revenue sources for the government. The revenue generated from these taxes can be used for public expenditure, including infrastructure development, which can indirectly support industrial output. Additionally, a stable and predictable customs and excise tax regime can enhance investor confidence and encourage both domestic and foreign investment in industries, leading to increased industrial output. Changes in tariffs and trade barriers, either unilaterally or through international agreements, can impact industrial output by altering the competitiveness of domestic industries and affecting market access for Nigerian goods abroad.

VAT is a consumption tax levied on the value added at each stage of production and distribution. Industrial firms in Nigeria that are engaged in the production of goods and services are typically required to pay VAT on inputs and raw materials. As VAT is added to the cost of production, firms may pass on the tax burden to consumers by increasing prices. Higher prices can lead to reduced consumer demand, potentially affecting industrial output if the demand for manufactured goods declines. The presence of VAT may affect investment decisions and capital expenditure by industrial firms. Higher VAT rates can increase the cost of machinery, equipment, and other capital goods, making them more expensive to acquire. Compliance costs, including record-keeping, filing returns, and VAT audits, can divert resources and time away from core business activities. These compliance burdens may particularly affect small and medium-sized enterprises (SMEs) in the industrial sector, which may have limited capacity to manage complex tax requirements. VAT serves as a significant source of government revenue. The revenue generated from VAT can be used to fund public infrastructure projects, such as transportation networks, power supply, and industrial parks (Odi, 2023).

Also, taxation as a fiscal policy instrument is a tool for societal development by those entrusted with social contract to collect taxes and deploy the same for the delivery of security and public goods that enhance the society's wellbeing. But how well this has been achieved in the case of Nigeria has remained a subject of daily debate following the fact public infrastructure such as roads, schools, railways, health care facilities, and power, among others, are either below required international standards or not available at all. The consequence is poor living standards among the populace and the high cost of doing business in the country. This positioning is the premise on the basis most countries measure their extent of growth, development and standard of living by the proportion of taxes as a percentage of 50.6% and 45.4% in 2003, while Australia and the United States of America collect 31.6% and 25.6% of their national income as taxes respectively", (OECD, 2008).

This similar record for Nigeria is either lacking or relatively below the expected standard. Taxes are of different kinds and affect individuals and organizations in diverse manners and, "in addition, different levels of taxation distort market activities to a greater or lesser degree. Evidence-based on a wide number of countries indicates that a 10% reduction in company tax could have anywhere between a 0.6% and 1.8% effect on economic growth rates. In Ireland, the effect of lowering the corporate tax rate in the business and services was shown to have significantly increased GNP in the years following the change" (O'Connor, 2014). The treatise of taxation and fiscal activities of government is the premise of the logic that taxation and government spending lead to higher growth rates. As argued by Dalibor (2002) government redistribution can stimulate savings and investment by redistributing wealth to individuals with a higher marginal propensity to save (MPS)". In a general perspective higher MPS can be found among people with higher incomes and redistribution stimulating economic growth would thus in reality be a redistribution from the poor to the rich". This circle of relationship boost output and other economic activities from various sectors of any economy, particularly the industrial output.

In a general perspective, taxation affects production through public expenditure, the ability to work, save and invest; and the diversion of resources from sectors not deemed productive to those deemed productive and profitable to both the government and private investors who aim to maximize returns on their investment. "What matters for these decisions is not only the level of taxes but also how different tax components are designed and combined to generate revenues and encourage productivity in the industrial sector and that is why the papers specific objective is to examine the impact of Company Income Tax (CIT), customs and excise tax and Value Added Tax (VAT) on industrial output in Nigeria. The effect of taxation on industrial output in Nigeria holds immense significance for various stakeholders. It provides insights into revenue generation, economic growth, competitiveness, policy formulation, and business decision-making. This paper employed Fully modified ordinary least square method (FMOLS), because it is superior to other regression model, it modified OLS to accommodate non stationary variables. The rest of the paper is divided into three sections which are materials and methods, presentation and analysis, conclusion and recommendations.

Materials and Methods

Conceptual Review

Tax is a mandatory, non-repayable remittance made to the government for products and services intermittently. It is normally paid by private businesses and consumers to the government (Agunbiade & Idebi, 2020). Omodero and Eriabie, (2022) opined that 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 government is empowered to control, administer and make provisions for laws, rules, regulations and policies that will regulate and guide the tax system to ensure all taxes are properly administered and all revenue generated is reimbursed to the government (Abomaye-Nimenibo, Micheal, & Friday 2018). Inyiama and Ubesie, (2016) defined taxation as a compulsory payment made by individuals and organization to relevant Inland Revenue authorities at the federal, state or local government level and they see taxation as a levy imposed by the government against the income, profit or wealth of the individual, partnership, corporate organization.

Nigeria's government is one of those countries that have the legal authority to impose any type of tax on its population at any rate it deems fit (Amadi & Alolote, 2019). Macek (2014) opinionated that utilizing taxation as a fiscal policy tool to help attain economic development is complex for developing countries as there is a reduction in the rate of tax revenue generated. Therefore, taxation is the art of charging citizens with taxes, while tax itself is seen as a mandatory payment to be made by every citizen of a state. This payment of tax is called a civic duty (Abomaye-Nimenibo et al., 2018). Taxes are frequently levied to

limit the creation of certain products and services, protect new businesses and local businesses, reduce the level of income disparity in society, also to regulate businesses and keep inflation under control (Edewusi & Ajayi, 2019). Due to the significance of tax in bringing revenue to the government for various uses, its ability to affect consumption patterns lead to the growth of the economy, exert influence on economic variables, and its ability to affect consumption patterns, the government of every nation will strive to maximize the revenues from tax (Asaolu, Uniamikogbo, Erah & Aggreh, 2018).

On the other hand, industrial output is given as the total output measured as the industrial sector contribution to the Gross Domestic Product (GDP) of Nigeria over the period of study. The Nigerian industrial sector is involved in activities aimed at transforming raw materials into partially finished or finished goods. While Kwode, (2015) viewed the industrial sector as the wealth-producing sector of an economy. It provides important material support for national infrastructure. The industrial sector is involved in the production of two categories of goods; consumer goods and capital goods (Etim, Mbobo, Ihenyen, and Ekanem, 2020).

Empirical Review

Oyinkansola and Omodero (2023), assessed the effects of tax revenue on the economic growth of Nigeria utilizing time series data spanning from the year 2000 to 2021. The study's specific goal is to evaluate the influence of hydrocarbon tax, corporation income tax and Value Added Tax on Nigeria's economic growth. The study employs a secondary form of data which has been sourced from the CBN statistical bulletin and published Federal Inland Revenue Statement. An ex-post facto research design is used for this study. The data collected are analyzed and tested for unit root using the Augmented Dickey-Fuller method. The study variables which comprise GDP, PPT, CIT & VAT are found to be stationary at first difference. Thus, a Johansen co-integration test is also conducted and it reveals a long-run relationship. Consequently, the study utilizes the Vector Error Correction Model to evaluate the effects of PPT, CIT and VAT on GDP. The findings reveal that PPT and VAT have positive and significant effects on GDP. It also reveals that CIT has a negative and significant effect on GDP.

While Omodero and Eriabie (2022), examined the extent to which value-added tax (VAT) receipts could cause industrial sector performance. Several studies on the influence of VAT on economic expansion have been conducted without a specific focus on industry output. This study uses secondary data from 2010 to 2021 to evaluate the causation effect of VAT proceeds on industry productivity in Nigeria. The dependent variable employed is the manufacturing output while the independent factors include: import VAT, domestic VAT and aggregate VAT receipts. The study applies Pairwise Granger Causality Tests which show that the local VAT returns and the aggregate VAT collection exhibit positive and strong causation effects on manufacturing output. The study also tests for relationships among the study elements, the results also show the existence of strong connections among the study variables. We conclude that VAT is indeed a growth factor in the industry performance in the country.

In a more recent study, Nwachukwu, Nwoha and Inyama (2022), examined the effect of taxation on the economic growth in Nigeria. The study adopted an ex-post facto research design. The data were analyzed with econometric techniques involving Descriptive Statistics, Augmented Dicker Fuller Tests for Unit Roots and the Ordinary Least Square (OLS). The result of the study indicates that value-added tax, petroleum profit tax, personal income tax and company income tax have a positive and significant effect on gross domestic product in Nigeria. The study thus concludes that taxation has a positive effect on gross domestic product in Nigeria. The implication is that a strong taxation policy is required for economic growth and development which will enhance employment generation, poverty alleviation, enhance capacity building for manpower and skills development promote growth and facilitate industrial development in Nigeria.

In another recent, Sydney and Araniyar (2021), a study on government expenditure and its effects on the industrial sector in Nigeria. They employed regression analysis. Findings from their study revealed that government capital expenditure has a positive and significant effect on the industrial sector; therefore, they concluded that government policy has a significant effect on the growth of the industrial sector. The study fails to specify the time frame within which the study covers and unit roots and Co-integration was not carried out. While Ighoroje and Akpokenere (2021) investigated fiscal policy and industrial sector output in Nigeria from 1987 to 2019, the study employed multiple regression methods and the Johansen Co-Integration Error correction model. Findings from their study show that fiscal policy has a long-run and short-run effect on the industrial sector output, but tax revenue has a positive but insignificant effect on the industrial sector output in Nigeria.

Pascal & Callistus (2020), examined the impact of taxation on industrial performance in Nigeria, fitted into a single linear model in which industrial performance is proxy by industrial output was the dependent variable and company income tax, petroleum profit tax, customs and excise duty tax, and manufacturing capacity utilization, served as the independent variables. However, from the result, jointly company income tax, petroleum profit tax, customs and excise duty and manufacturing capacity utilization, has a significant relationship on industrial output but individually tested, it shows that, Company income tax and petroleum profit tax has a positive impact and no significant relationship on industrial output while customs and excise duty tax, and manufacturing capacity utilization has a positive impact and significant relationship on industrial output. It was concluded that, the success of fiscal policy in promoting industrial sector depends on the level of public revenue available, the direction of public expenditure and its implementation and it was recommended, Expansionary policies on fiscal policy measures should be encouraged as they play vital role for the growth of the industrial sector output in Nigeria.

In another study, Eze and Ogiji (2018), examined the impact of government tax revenue on manufacturing sector output in Nigeria using an error correction model. The study finds that there is a negative significant relationship between government tax revenue and

manufacturing sector output in Nigeria. They suggest that an increase in government tax revenue leads to a decrease in manufacturing sector output. The study also finds that the relationship between government tax revenue and manufacturing sector output is not stable over time. They suggest that the impact of government tax revenue on manufacturing sector output may vary depending on the economic conditions. Similarly, Becker and Holmes (2018), analyze the effect of taxation on both firms which are profitable and unprofitable in Germany. Investment, Tax, Liquidity and Firm growth were the main variables. They described the events in which payout taxes has changed by three percentage points and compare the five years tax change effect with two years following it. Research findings concluded that payout tax adjustment has an economically considerable adverse effect on allocation of the investment, and profitability but has no relationship with the firm growth of the firms.

While, Ogbole, Sonny and Isaac (2018), focused on the comparative analysis of the impact of fiscal policy on industrial activities in Nigeria during regulation and deregulation, using the econometric methods of co-integration and error correction model. The study indicates that there is a negative difference in the effectiveness of fiscal policy in stimulating the industrial sector during and after a regulation period. They recommend that government fiscal policy should refocus and redirect government expenditure towards the production of goods and services to enhance the industrial sector. In recent work, Etim, Mbobbo, Ihenyen, and Ekanem, (2020), investigated the relationship between taxation and manufacturing output in Nigeria from 1985 to 2018. This is the premise of the argument taxation causes a disincentive to investment and entrepreneurship. Data were gathered from the published reports of the Central Bank of Nigeria, Federal Inland Revenue Service and National Bureau of Statistics covering the period of the study; an ex-post facto research design was adopted. Collected data on manufacturing output, companies' income tax, personal income tax, value-added tax and petroleum profit tax were analysed using the ordinary least square technique. The results concluded that CIT and VAT were not statistically significant while PIT and PPT were statistically significant with a positive relationship with manufacturing affirming the theoretical conception that companies' income tax discourages entrepreneurship.

In another study, Adigwe, Echekoba and Raymon (2015), examined tax as a fiscal policy and manufacturing company's performance as an Engine for Economic Growth in Nigeria, the study employed a descriptive method using the ANOVA analysis of variance using a statistical Package for Social Science (SPSS). The study found that taxation as a fiscal policy instrument has a significant effect on the performance of Nigeria manufacturing companies, they recommended that the government required to be sensitive to the variables in the tax environment and other macro-environmental factors to enable the manufacturing sector to cope with every changing dynamic of the manufacturing environment. While, Gatsi, Gadzo and Kportorgbi (2017), employed panel data methodology covering ten listed manufacturing firms from Ghana over seven years from 2005 to 2012 to empirically determine the effect of corporate income tax on financial performance. The study showed that there is a significant negative relation between

corporate income tax and financial performance. Also, the firm's size, age of the firm and growth of the firm revealed a statistically significant positive relationship with financial performance.

Theoretical Framework

This paper is anchored on the Ability to Pay Theory, which was formulated by MS Kendrick in 1939, is an economic and taxation concept that asserts that individuals or entities should contribute to the tax burden based on their ability to pay, typically measured by their income or wealth. This theory emphasizes the principle of equity in taxation, arguing that those with higher incomes or greater financial resources should bear a larger share of the tax burden than those with lower incomes. The main idea behind the Ability to Pay Theory is rooted in the concept of progressive taxation. Progressive taxation involves tax rates that increase as income or wealth increases. The rationale is that individuals or entities with higher incomes or greater wealth can afford to pay a larger portion of their income or assets in taxes without experiencing significant financial hardship. In contrast, those with lower incomes may struggle to meet basic needs, and taxing them at higher rates could exacerbate income inequality and create undue hardship.

The ability to pay theory aligns with the principle of horizontal equity, which states that individuals or entities in similar economic situations should be treated similarly in terms of taxation. By basing tax obligations on the ability to pay, the theory aims to ensure that tax burdens are distributed fairly and proportionally. It is worth noting that the Ability to Pay Theory is not the sole principle guiding tax policy, as other considerations such as economic efficiency, administrative feasibility, and political factors also come into play. Nevertheless, the theory provides a moral and ethical framework for designing tax systems that aim to achieve fairness and reduce income inequality.

In practice, the application of the ability to pay theory can be seen in progressive income tax systems where tax rates increase as income levels rise. Many countries around the world have adopted progressive tax structures, with higher-income individuals or entities paying higher marginal tax rates. This approach allows governments to generate revenue while attempting to reduce the burden on lower-income individuals and promote a more equitable distribution of income and wealth.

Method and Model Specification

The source of data used for this paper is time series annual data collected from the publications of the Central Bank of Nigeria (CBN) statistical bulletin, National Bureau of Statistics (NBS), and Federal Inland Revenue (FIRS). The data generated are data on industrial output, (Billion Naira); Taxation: Company Income Tax (CIT), Customs & Excise Duties and Value added Tax (VAT) all in (Billion Naira). Ex-post-facto research design was employed for this study. An ex-post-facto research design is appropriate for this study because it describes the statistical relationship between two or more variables. The use of this design allows for the testing of expected impact relationships between taxation and industrial output and for making predictions regarding these relationships.

This study conducted unit root tests (pre-estimation diagnostics test) using Phillips Perron (PP) to ascertain the stationarity of the data before carrying out the cointegration test. Dickey and Fuller (1979), have also stressed the importance of investigating time series data and whether they exhibit random walks that needed to be white-noised before using them for estimation purposes. After conducting the stationarity test on the time series, it is crucial to ascertain if they have a long-run relationship. The use of the cointegration technique allowed the study to capture the equilibrium relationship between non-stationary series within a stationary model following Adams (2009). This paper employed the Fully Modified Ordinary Least Square Method (FMOLS) because it is superior to other regression model, it modified OLS to accommodate non-stationary variables, even if the variables are not stationary at level, they must be stationary at the first difference and has conditions below taken into consideration: All the variables must be integrated of order one I (1), there must be co-integration among variables.

Model Specification: Based on the literature reviewed, the model for this paper was adapted from Pascal O. K & Callistus O. in their work Impact of Taxation on Industrial Performance in Nigeria (2020). The previous researcher above used model (1).

$$INDOT = F(CIT, PPT, CET, MCU) \dots \dots \dots (1)$$

This study modified the model thus: Firstly, the functional and linear relationship between taxation and industrial output is established thus:

$$INDU = f(X_i) \dots \dots \dots (2)$$

and the linear form

$$INDU_t = f(CIT_t, CED_t, VAT_t) \dots \dots \dots (3)$$

The relationship in equation (3), can be econometrically formulated thus:

$$INDU_t = a_0 + a_1 CIT_t + a_2 CED_t + a_3 VAT_t + m_t \dots \dots \dots (4)$$

Where: INDU represent the Industrial Output in Nigeria;; CIT represent the Company Income Tax in Nigeria; CED represent the Customs and Excise Tax in Nigeria; VAT represents the Value Added Tax in Nigeria a_0 = the intercept, a_1, a_2 are the coefficients of taxation, while m_t is the disturbance term which captures the effect of other variables not included in the model.

Results and Discussion

Table 1: Descriptive Statistics

	INDU	CIT	CED	VAT
Mean	18135.02	871.3705	649.3656	324.9510
Std. Dev.	15436.42	729.2598	734.8325	274.4246
Skewness	0.933159	0.341732	1.966584	1.004112
Kurtosis	2.866368	1.559417	6.160451	3.353768
Jarque-Bera	3.501003	2.542403	25.45826	4.158117
Probability	0.173687	0.280494	0.000003	0.125048
Observations	24	24	24	24

Source: Authors Computation, (Eview-12), 2023

Table 1 presents descriptive results for the industrial output in Nigeria over 24 years from 1999 to 2022. The average industrial output during this period was 18135.02, with a standard deviation of 15436.42, indicating a significant deviation from the mean of 2,698. This suggests that the Industrial sector in Nigeria experienced considerable dispersion and fluctuation in output growth, which has been relatively low over the years. Additionally, the mean values of Company Income Tax (CIT), Customs and Excise Duties (CED), and Value Added Tax (VAT) were 871.3705, 649.3656, and 324.9510, respectively, indicating disparities and fluctuations from their respective standard deviations.

The skewness coefficients for INDU, CIT, CED, and VAT were all positive and greater than zero, with values of 0.933159, 0.341732, 1.966584, and 1.004112, respectively. This suggests that while they are positively skewed, they are not symmetrical around the mean, deviating from a normal distribution. The kurtosis values for CED and VAT were 6.160451 and 3.353768, respectively, both exceeding three, indicating leptokurtic distributions (slim or long-tailed) with peakedness relative to a normal distribution. On the other hand, the kurtosis values for INDU and CIT were 2.866368 and 1.559417, respectively, which are less than 3, indicating flat (platykurtic) distributions relative to a normal distribution. The normality analysis revealed that CIT and VAT follow a normal distribution, while CED does not. This was supported by the Jarque-Bera probability values of 0.173687, 0.280494, 0.125048, and 0.000003 for INDU, CIT, VAT, and CED, respectively. These probability values were all greater than 0.05, indicating a lack of significant departure from normality for INDU, CIT, and VAT, but a significant departure for CED.

Unit Root Test

To assess the stability of the data and determine the significance of the variables included in the model, stationarity tests were conducted. The significance of these variables was determined by comparing the absolute values of the test statistics to the absolute critical value at a 5% level of significance. In accordance with the unit root theory, the null hypothesis is accepted when either the absolute test statistics is lower than the absolute critical value or the probability value (p-value) is greater than 0.05. This indicates that the variable under consideration possesses a unit root, suggesting non-stationarity.

Table 2: Summary of ADF unit Root Test Result

Variables	Adf Test Statistics	Critical Values	Order Of Integration
Industrial Output (INDU)	-3.954733	-3.004861	I(1)
Company Income Tax (CIT)	-4.952316	-3.632896	I(1)
Customs & Excise Duties (CED)	-5.334992	-3.690814	I(1)
Value Added Tax (VAT)	-9.170869	-3.587527	I(1)

Note: The test includes both Trends and Intercepts and all at a 5% level of significance.

Source: Authors Computation, (Eview-12), 2023

The Augmented Dickey-Fuller (ADF) test results indicated that all variables were stationary when differenced at the first order, and this stationarity was significant at the 5% level. Therefore, the unit root hypothesis was rejected for each of the variables under investigation.

Table 3: Cointegration Bound Test

F-Bounds Test		Null Hypothesis: No levels of relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	8.515129	10%	3.47	4.45
K	3	5%	4.01	5.07
		2.5%	4.52	5.62
		1%	5.17	6.36

Source: Authors Computation, (Eview-12), 2023

Based on the co-integration test presented in table 3, the F-statistic value of 8.515129 exceeds the lower and upper critical values of 4.01 and 5.07, respectively, at a 5% significance level. This indicates that the variables are co-integrated, suggesting a long-run equilibrium relationship between industrial output and the various taxes in Nigeria from 1999 to 2022. Consequently, the null hypothesis of no long-run relationship is rejected at the 5% significance level. Since the unit root test confirms that the variables are stationary at the first difference 1(1), we can proceed to estimate the Fully Modified Ordinary Least Squares (FMOLS) model.

Table 4: Fully Modified Ordinary Least Square (FMOLS)

Dependent Variable: MSO

Null Hypothesis: Series are not cointegrated

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CIT	4.38526	2.732655	1.604762	0.125
CED	-0.09332	2.822518	-0.03306	0.974
VAT	44.18797	12.31194	3.589033	0.002
C	76.08267	1088.441	0.069901	0.945
R-squared	0.961562			
Adjusted R squared	0.955493			
F-statistic	192.5943			
Prob(F-statistic)	0.00000			

Source: Authors Computation, (Eview-12), 2023

According to the findings in table 4, when holding company income tax, Customs & Excise Duties, and value-added tax constant, the industrial output was recorded at N 76.08267 billion. Moreover, there is a positive relationship between value-added tax and industrial output, suggesting that an increase in value-added tax leads to an increase in industrial output. Similarly, company income tax shows a positive relationship with industrial output during the reviewed period. However, Customs & Excise Duties exhibit an inverse relationship with industrial output, meaning that an increase in Customs & Excise Duties results in a decrease in industrial output in Nigeria. The model's goodness of fit, as indicated by the R-squared (R2) and adjusted R-squared (adjusted R2) values of 0.96 and 95% respectively, demonstrates a strong fit. Specifically, the adjusted R2 value of 95% implies that 95% of the total variation in industrial output in Nigeria can be explained jointly by variations in value-added tax, company income tax, and Customs & Excise Duties, with the remaining 5% being accounted for by the stochastic error term. The overall significance of the model was tested using the F-statistic, resulting in a high and highly significant p-value of 0.0000 and an F-statistic value of 192.5943. This confirms the model's strong explanatory power and further supports its good fit.

Post Estimation Diagnostic Test

Normality Test

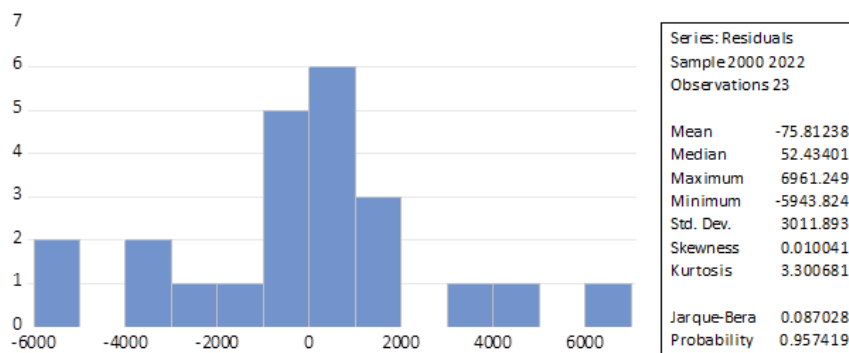


Figure 1: Normality Test

Figure 1 presents the results of the Jarque-Bera test, where it can be observed that the probability value is 0.087028. With a probability value of 0.957419, the hypothesis of no normal distribution should be accepted since the probability value is greater than 0.05.

Discussion of Findings

The analysis uncovered several key findings. Firstly, the study revealed that company income tax had a positive relationship with industrial output in Nigeria, although this relationship was found to be statistically insignificant. The findings suggested that a 1% increase in company income tax would lead to a 4.38526% increase in industrial output. Secondly, the analysis demonstrated that Customs & Excise Duties had an inverse relationship with industrial output. Specifically, for every 1% increase in Customs & Excise Duties, industrial output was estimated to decrease by approximately -0.09332%. Lastly, value-added tax (VAT) was found to have a positive relationship with industrial output, and this effect was statistically significant with a p-value of 0.02. The results indicated that for every 1% increase in VAT, the industrial output would increase by approximately 44.18797%.

Overall, these findings highlight the varying effects of different tax components on industrial output in Nigeria, with VAT positively influencing industrial output, company income tax showing a positive but insignificant relationship, and Customs & Excise Duties exerting a negative impact on industrial output. This finding is in agreement with the work of Adigwe, Echekeba and Raymon (2015), in their study Tax as a fiscal policy and manufacturing company's Performance as an Engine of economic growth in Nigeria, which revealed a significant effect between tax revenue and performance of manufacturing sector.

Conclusion and Recommendations

In conclusion, these findings suggest that VAT positively influences industrial output, while the relationship between company income tax and industrial output is not statistically significant. Additionally, higher Customs & Excise Duties exert a negative impact on industrial output. Based on these findings, the following recommendations can be made:

- i. **Company Income Tax Evaluation:** Although the relationship between company income tax and industrial output was statistically insignificant, policymakers should review and evaluate the existing tax policies. This evaluation should consider tax rates, incentives, and exemptions to create a more conducive environment for industrial growth. By implementing targeted reforms, the potential positive relationship between company income tax and industrial output can be strengthened.
- ii. **Customs & Excise Duties Review:** The analysis highlights the negative impact of Customs & Excise Duties on industrial output. Policymakers should review duty rates and trade policies to promote industrial growth. Lowering duties, particularly on essential inputs and machinery, and creating favourable trade conditions can help mitigate the adverse effects of these duties on industrial output.

- iii. VAT Optimization: Given the significant positive relationship between VAT and industrial output, policymakers should focus on optimizing VAT policies. This could include improving tax collection mechanisms, streamlining procedures, and ensuring compliance. By enhancing the efficiency and effectiveness of VAT, the positive impact on industrial output can be further enhanced.

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Appendix 1

Table 5

Year	Industrial output (N' Billion)	VAT (N'Billions)	CIT (N'Billions)	Customs & Excise Duties (N' Billion)
year	INDU	VAT	CIT	CED
1999	1609.82	23.75	46.20	87.9
2000	2388.83	30.64	53.30	101.5
2001	2328.41	44.91	69.40	170.6
2002	2650.03	52.63	89.10	181.41
2003	3525.14	65.89	114.80	195.5
2004	5145.43	96.20	130.80	217.2
2005	6520.74	87.45	170.20	232.8
2006	7822.11	110.57	246.70	177.7
2007	8441.76	144.37	332.40	241.4
2008	9874.38	198.07	420.60	281.3
2009	9229.81	229.32	600.60	297.5
2010	13826.43	275.57	666.10	309.2
2011	17853.11	318.00	715.40	438.3
2012	19587.72	347.69	846.60	474.9
2013	20853.85	389.53	998.40	433
2014	22213.01	388.85	1204.80	566
2015	19188.58	381.27	1408.43	546
2016	18641.17	397.06	1599.60	548.8
2017	25639.9	473.77	1675.73	628
2018	33218.33	533.74	1751.85	1286.42
2019	39879.69	564.45	1830.27	1346.9
2020	43330.78	699.37	1905.40	1562.115
2021	55300.97	969.41	1980.54	2240.88
2022	46170.48	976.32	2055.68	3019.45