

PROGRESSIVE TAXATION AND INCLUSIVE GROWTH IN NIGERIA: AN ECONOMETRIC APPROACH

SALIHU, Musa Olalekan,
Medium Taxpayer Department, South
Federal Inland Revenue Service

ABSTRACT

Nigeria's experience highlights a persistent struggle to translate economic growth into inclusive growth, with debates about the role of taxation generating various interpretations in academic literature. The link between progressive taxation and inclusive growth remains underexplored in Nigeria. This study investigated the effect of progressive tax on inclusive growth, using secondary annual data from 1991 to 2023. Data on Gross Domestic Product per employed person, tax progressivity, and government expenditure on education were obtained from the Federal Inland Revenue Service and World Bank's World Development Indicators, while the political stability index was sourced from the International Country Risk Group. The analysis was conducted using the Autoregressive Distributed Lag (ARDL) method, with inferences made at a 5% significance level. Results indicate a stable long run cointegration relationship; oil tax progressivity and government education expenditure significantly promote inclusive growth, whereas political instability significantly hinders it. In the short run, non-oil tax progressivity, education expenditure, and political instability have significant impacts on inclusive growth, while oil tax progressivity does not. This study recommends strengthening the progressivity of non-oil taxes by improving tax administration and increasing investment in education to enhance productivity and equity.

Keywords: ARDL, Inclusive Growth, Nigeria, Non-oil Tax, Oil Tax, Progressive Taxation

1. INTRODUCTION

Economic growth is a cornerstone of national development, yet its benefits are not always distributed fairly across populations. The wealthiest 1% of the global population owns 43% of global assets, while the poorest 50% hold less than 1% of global wealth (Oxfam International, 2025). Sub-Saharan Africa exhibits significant inequality, with Gini coefficients ranging from 0.31 in Ethiopia to 0.63 in South Africa, placing seven countries (including Nigeria) among the world's ten most unequal (World Bank, 2025). Nigeria economic growth has not sufficiently translated into reduced poverty or inequality. The poverty rate among Nigeria's rural population has reached an alarming 75.5% highlighting deepening inequality and widespread economic hardship across the country (World Bank, 2025). This disconnect between growth and welfare improvements underscores the limitations of growth models focused solely on aggregate gains, highlighting the need for a shift toward inclusive growth that benefits all segments of society.

Inclusive growth, an evolution of the pro-poor growth concept, emphasizes equitable distribution alongside economic expansion, ensuring that the poor benefit from progress even without direct participation (Asian Development Bank, 2007; Kakwani, 2000; White & Anderson, 2001). This approach has shaped development strategies, such as the African Union's post-2015 agenda and action plan for a better Nigeria which prioritizes structural transformation and social inclusivity to leave no one behind (All Progressive Party, 2023; African Union, 2016; Vellala & Chattopadhyay, 2016).

Thus, the emphasis is now on Progressive taxation, as a critical mechanism for advancing inclusive growth by reducing income and wealth inequality, as advocated by Piketty (2014) and supported by studies highlighting its redistributive potential (Abdel-Kader & Mooij, 2020; Dalda & Khobai, 2018; Gbato, 2017). However, challenges such as asset valuation, tax evasion, and potential adverse effects on economic growth complicate its implementation (Alstadsaeter et al., 2019). Research further suggests that property and consumption taxes are less harmful to growth compared to corporate or personal income taxes, which, while effective for redistribution, may impede economic expansion (Abdel-Kader & Mooij, 2020; Acosta-Ormachea & Yoo, 2012). Thus, re-examining the role of progressive taxation in fostering inclusive growth within Nigeria's unique economic and social context is essential.

Research Objectives

The study examines progressive tax and inclusive growth nexus in Nigeria. Specifically, the objectives of the study are to:

- a. Determine whether there is a nexus between progressive taxation and inclusive growth in Nigeria
- b. Investigate the effect of oil and non-oil tax progressivity on inclusive growth in Nigeria

The Statement of Research Hypothesis

From the foregoing, the following research hypotheses have been formulated.

H01: There is no nexus between progressive tax and inclusive growth in Nigeria.

H02: There is no significant effect of progressive oil and non-oil tax on inclusive growth in Nigeria.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework

Economic growth and well-being are connected to explore how tax structure influences inclusive growth. Thereby, demonstrating how tax structure is taken into account by production function as a factor that affects output and ensures the welfare of the entire population, resulting in overall inclusive economic growth. The focus here is on the utilitarian social utility function, which holds that growth, and its distribution are the main components of inclusive growth (Kakwani & Pernia, 2000). Then, Ali and Son (2007) show that the generalized concentration curve is the cumulative distribution of a social mobility curve with a fundamental welfare function that satisfies transfer and improves its argument features. Only when two social mobility curves don't meet can the amount of inclusion be determined by ranking the curves.

The level of inclusion can be determined by ranking social mobility curves, but only if two social mobility curves don't cross each other. An increase in the social mobility curve at that time shows that growth is happening for everyone. The earlier two properties: growth and distributional dimension, replicate income and substitution effect, respectively in Lorenz curve. Based on the transfer property/distributional dimension, any social transfer from the rich to a poor person will have a higher generalized concentration curve. This indicates that income redistribution through social spending or progressive tax structure shifts upward the generalized concentration curve, which signifies a higher degree of inclusiveness. In addition, greater affluence will result in a higher generalized concentration curve because the curve's arguments are expanding (Anand et. al., 2013).

The mathematical expression of the framework as proved by Anand et.al, (2013) shows that income equity (w) depends on social mobility index or area ($\bar{y}^* = \int_0^1 \bar{y} d_i$) on the above graph and mean income ($\bar{y}$).

That is $w = \frac{\bar{y}^*}{\bar{y}}$ 1

Such that the extent of income equity ranges between zero and one ($0 \leq w \leq 1$). The closer it is to one, the lower the income inequality. If everyone in a population earns the same income ($\bar{y}^* = \bar{y}$), the income distribution will be perfectly equitable (i.e., $w = 1$). However, in a scenario where only an individual earns income in an economy, the income distribution will be perfectly unequal (i.e., $w = 0$).

By rearranging equation 1

$$\bar{y}^* = w \cdot \bar{y} \quad 2$$

The above equation shows that inclusive growth requires an increase in $\bar{y}^*$. For that to be achieved mean income $\bar{y}$ and or income equity index w must increase.

- An increase in mean income can be attained through economic growth.
- An increase in the income equity index can be realized through an increase in equity.

As demonstrated in equation 3.3, the degree of inclusivity is determined by the level of changes in output level and equitable income index. The total differential of equation 2 gives:

$$d\bar{y}^* = w \cdot d\bar{y} + dw \cdot \bar{y} \quad 3$$

A: $(w \cdot d\bar{y}) \Rightarrow$ contribution of change in income to change inclusiveness while equity is constant

B: $(dw \cdot \bar{y}) \Rightarrow$ the contribution of change in equity to change in inclusiveness while income is constant

Equation 3.3 is divided by equation 3.2 to decompose inclusive growth into income growth rate and rate of change in equity.

$$\text{That is } \frac{d\bar{y}^*}{\bar{y}^*} = \frac{d\bar{y}}{\bar{y}} + \frac{dw}{w} \quad 4$$

This implies that any inclusive growth policy framework should target growth/efficiency and equity.

The endogenous growth model establishes a connection between the income growth component and fiscal actions, in particular, tax structure. Barro and Sala-i-Martin's (1992) revised version of the AK model included a tax system that increased output within strict budgetary limits.

2.2 Empirical Review

Saibu (2015) adopted least squares method to investigate the empirical link between taxes and economic development in South Africa and Nigeria. The analysis results indicate that the nonlinearity hypothesis about taxation's impact in South Africa is refuted, whereas a noteworthy non-linear relationship is detected in Nigeria. Based on the research results, it has been determined that the most effective tax rate for promoting economic growth in South Africa and Nigeria is around 15% of the GDP per capita. The tax rate in question is anticipated to generate economic growth rates of 6 and 8 per cent, surpassing the current mean growth rates of 4.51 and 2.84 per cent for Nigeria and South Africa, respectively. The study focuses exclusively on the threshold phenomenon of aggregate tax revenue without any explicit reference to a specific category of taxes.

Agu et al. (2015) investigated the effects of different fiscal policy on the economy of Nigeria. In the study, growth rates were identified and explicated, while ordinary least square (OLS) in various forms was utilized to establish the nexus between government expenditure and economic growth. The study's results display a positive bond between aggregate government expenditures and government revenue, with the former reaching its maximum prior to the latter. The country's economic growth is grim, as recurrent spending were notably higher than investment expenditures. Moreover, their findings suggest a connection between economic growth and public expenditure

on economic services. The analysis did not include an assessment of the impacts of taxation or its constituent elements on distribution and economic growth.

Babalola (2015) analysed the effect of fiscal measure on Nigeria's economic progress, considering both the immediate and enduring consequences. The study employed Error Correction Mechanism, Co-integration, and Pair-wise Correlation to examine the impact of recurring public investment and public expenditure on economic progress over the long- and short-terms. The findings revealed a significant and positive effect of these factors on economic development during the analysis period. The short-term impact of capital expenditure was favourable. However, their long-term impact was not significant. Additionally, it illustrates that tax revenue has a significant adverse impact in both the immediate and prolonged periods. The study also placed a higher emphasis on economic expansion as opposed to promoting inclusive growth and development.

Akhor and Ekundayo (2016) investigated the influence of indirect tax collection on the economic growth of Nigeria. The research employed customs and excise duty and value-added tax revenue as exogenous variables and real GDP as a surrogate for economic expansion as the endogenous variable. The study utilizes data spanning 1993 and 2013. The error correction model indicates that the value-added tax had an adverse impact on the real Gross Domestic Product. Similarly, antecedent tariffs and levies on imports and exports negatively affected the actual gross domestic product. The coefficient of the Error Correction Model displayed the anticipated negative sign and was significant. This exemplifies the expeditious resolution of transient divergence. The analysis is limited in scope as it concentrates exclusively on the expansion of indirect taxes while disregarding other notable elements of the tax progressivity.

Bashir (2016) investigated the correlation between government expenditure and the promotion of inclusive development in Nigeria during the period spanning from 1995 to 2014. The study utilize Auto-Regressive Distributed Lag (ARDL) bound testing method to examine the long-term effects of economic freedom, public spending on health, public resource utilization, and real GDP growth rate on inclusive growth. The findings revealed a noteworthy positive impact of these factors on inclusive growth. The research has also revealed that, within a limited timeframe, solely the genuine Gross Domestic Product (GDP) had a significant influence on inclusive growth, whereas other variables had an insignificant influence.

Eugene and Abigail (2016) examined the impact of tax policy on the development of the Nigerian economy. This study applied OLS regression analysis to a 20-year time series (1994-2013). The results indicate that taxes exert a significant impact on the economic growth of Nigeria. It has been ascertained that the ratio of indirect taxes in relation to the overall tax burden has exhibited an upward trend over a period. Diverse factors exert distinct impacts on economic development, and research suggests that indirect taxation significantly impacts Nigeria's economic growth. The findings on direct taxes show a fragile nexus between direct tax policy and economic growth.

McNabb (2016) examined the correlation between tax framework and economic expansion across a sample of 100 nations, encompassing both developing and developed nations. The econometric

tool employed is an Error Correction Model (ECM) with a Pool Mean Group (PMG). The findings suggest that the most significant changes in tax structure over the preceding three decades a transition from trade taxes and toward consumption taxes have had a negligible positive effect on low- and middle-income economies. In addition, it has been observed that revenue-neutral hikes in social contributions or income taxes (especially personal income tax) can have an adverse impact on the sustained growth of per capita GDP. These findings cast doubt on a few previous findings; in particular, this article reveals that the impact of various taxes on growth varies by income level, thereby challenging the external validity of previous research.

Brys et al. (2016) investigated how characteristics of tax in OECD nations could be enhanced to promote equitable economic growth. The results indicate that increasing horizontal equity may aid in enhancing vertical equity. For example, better harmonizing labour and capital income taxation may promote vertical and horizontal equity. Horizontal equality is improved by treating various categories of income more equitably. As a result of more horizontally equal tax treatment of capital and labour income, there are fewer opportunities and incentives for high-income earners to transfer compensation from wages to capital income, resulting in greater vertical equity.

According to Heathcote et al. (2017), a less progressive tax and transfer system produces welfare benefits in industrialised economies. This suggests that tax progressivity is not a good way to reduce inequality in pay before taxes, since the skill premium goes up in general equilibrium when there are fewer high-skilled workers. It also suggests that tax progressivity is not a good way to reduce inequality in pay before taxes, since the skill premium goes up in general equilibrium when there are fewer high-skilled workers. According to Heathcote and others, tax progressivity reduces incentives to work and invest in talents. However, they underscore greater progressivity if poverty is an impediment to skill investment.

Stoilova (2017) examined the influence of tax structure on economic growth in the 28-EU member states. The descriptive research focused on international differences in overall tax burden and tax structure design. On the other hand, the empirical approach examines the effect of taxes on economic development using panel data regressions. According to the study, a tax structure based on selective consumption taxes and property and personal income taxes promotes economic growth.

Di Sanzo et al. (2017) investigated the connection between economic development and tax structure in European Union nations using panel-integrated VAR models. According to the test, the data does not support the moderate exogeneity and linearity hypothesis. It has been demonstrated that recurring taxes on immovable property has the least negative impact on economic growth, whereas there is no evidence to support consumption taxes over income taxes. The findings were robust and significant only when the tax burden (i.e., tax-to-GDP ratio) exceeded a threshold of approximately 30 per cent.

Babatunde et al. (2017) examined the relationship between taxation and economic development in Africa. The preliminary evaluation involved the application of descriptive statistics and unit root

tests, which indicated that both GDP and tax levels exhibited stability and normality. The empirical evidence indicates that there exists a positive correlation between tax revenue and gross domestic product (GDP) in Africa, thereby fostering economic development in the region. The research findings indicate a robust and affirmative relationship between tax revenue and Gross Domestic Product. Nonetheless, the analysis fails to showcase the constituent's influence of the tax structure.

Hanusch, Chakraborty, and Khurana (2017) use a comprehensive Neo-Schumpeterian framework to examine the effectiveness of public spending on economic development. This study used a fixed-effects model for G20 nations to examine the relationships between specific types of government spending and economic growth, as measured by human capital formation, defence, technological innovation, and infrastructure development. According to the finding, spending on new technologies and other forms of innovation was found to have a much larger impact on GDP growth than any other single macroeconomic factor.

Gashi et al. (2018) investigated the influence of tax framework in Kosovo on the country's economic growth during the period spanning from 2007 to 2015. This research uses linear regression to evaluate the influence of diverse tax categories on economy's growth. Their findings show that a significant number of taxes have a positive influence on the growth of GDP. However, it is imperative to note that the effect of each tax on GDP growth may not be uniform.

The study by Thaci and Grxhaliu (2018) examined the prevalent tax structures in developing nations. The tax policies of these nations are characterized by a tax system that depends heavily on taxes levied on foreign trade to generate a larger portion of their budgetary tax revenues, as opposed to direct taxes. The result indicates a negative relationship between economic development and taxation, as observed by the previous researchers.

Zulfiqar (2018) investigated the effect of fiscal policy on various economic aspects such as inequality reduction, poverty reduction, productive employment generation, and the achievement of inclusive economic growth in Pakistan. The study employed vector autoregressive (VAR) models and cumulative impulse response functions (IRFs) to estimate elasticities for the different public expenditure and tax components. The research findings indicate that fiscal policy lacks efficacy in fostering comprehensive and equitable economic progress. Furthermore, it displays that the fragile correlation between fiscal policy and the promotion of inclusive economic growth poses a challenge to the fundamental principles and ideals of the latter in an emerging country.

Dladla and Khobai (2018) investigated the influence of taxes on economic growth in South Africa. The study used the ARDL approach to conduct the analysis. The findings of the empirical analysis show that there exists an inverse relationship between taxation and economic growth in the context of South Africa. The research findings suggest a significant interdependence exists among economic growth, commerce and openness, capital, and taxation. It also implies that fiscal policy is crucial to South Africa's long-term economic growth. The study focuses on taxation's impact on South Africa's economic growth.

The study conducted by Traore (2018) explored the importance of public expenditure in encouraging inclusive growth within the Sub-Saharan African region. The findings of the vector autoregression (VAR) results suggest that, in Sub-Saharan African (SSA) economies, infrastructure investment has had a greater impact on promoting inclusive development over time in comparison to other forms of government expenditure. Additionally, it is common for social expenditures in developing countries to disproportionately benefit the affluent and middle-income groups rather than the underprivileged.

Oboh et al. (2018) examined the influence of tax revenue on the economic growth of countries within the Economic Community of West African States (ECOWAS). The study utilized the Seemingly Unrelated Regression Estimate (SURE) methodology to analyse data from 2000 to 2015 for a sample of five Economic Community of West African States: Ghana, Nigeria, Sierra Leone, Burkina Faso, and Benin. The findings suggest that the overall tax revenue has a significant and favourable effect on economic growth. A dollar rise in total tax revenue stimulates the economy by 43.22 per cent. The study also indicates that there is a negative correlation between a rise in direct tax revenue and development, with a decrease of 3.08 per cent observed in the nations under study. This hints that direct taxes may not be an effective means of promoting development. Furthermore, it can be observed that a rise of one dollar in indirect tax revenues resulted in a corresponding increase of one dollar in economic growth, equivalent to 47.7 per cent. The study's limitation pertains to its inadequate consideration of the comparability of tax estimates, specifically those pertaining to income tax, across different countries and time periods. Insufficient elucidation was provided regarding the impacts of both direct and indirect taxation.

Traore (2019) examined the effects of various government tax components on the inclusivity of growth in developing nations. The research also investigates the influence of institutional factors on tax policies execution. The result suggest that tax policy exerts a noteworthy threshold impact on inclusive growth solely in the presence of high-quality institutions, characterized by low levels of corruption and a robust bureaucratic policy. Furthermore, the research indicates that there exists an ideal taxation rate beyond which any augmentation in the individual income tax rate is likely to impede inclusive growth. The analysis of the threshold phenomenon has indicated that the value-added tax (VAT) revenue positively impacts the promotion of inclusive growth commencing from a specific threshold.

Hope (2019) investigated the connection between the tax framework of Ghana and its economic progress during the period spanning from 2009 to 2017. The ARIMAX time series method was employed to assess the association. The findings show that the tax framework, encompassing both direct and indirect taxes, exerts a favourable impact on the growth of the economy. The National Health Insurance tax has been identified as the principal factor responsible for the favourable influence of indirect taxes on the Gross Domestic Product. Indirect taxes, in general, have an adverse impact on the growth of the economy.

Oseni and Adekunle (2020) investigated the efficacy of Wagner's theory in realizing developmental goals in Nigeria from 1980 to 2017. Two-step Engle and Granger estimate approach was used for the inquiry. The results demonstrate that rising government spending strongly predicts changes in real GDP, lending empirical support to Wagner's hypothesis as a key concept for attaining Sustainable Development Goals in Nigeria. The restraint of the study is that it only assesses the indirect impact of taxation via government expenditure.

Alekhina and Ganelli (2020) investigated the contribution of macrostructural determinants towards promoting inclusive growth in Asian countries. The scenario analysis suggests that implementing fiscal redistribution and labour-market-focused structural changes accelerates inclusive development in Asian countries. Alekhina and Ganelli's research findings suggest that FDI, digitalization, and savings facilitate inclusive development.

Yinusa et al. (2020) research the effects of inclusive growth, institutional quality and financial development through the utilization of Asymmetric Cointegration VAR. The work reveals that in Nigeria, there exists a persistent association between financial development, institutional quality, and inclusive growth. In addition, it was discovered that changes to equilibrium for financial development, institutional quality, and inclusive growth in Nigeria are asymmetric. The statement posits that the inclusive growth of Nigeria is significantly impacted by financial development and institutional quality. The study's main limitation lies in its restricted scope, which solely concentrates on Nigeria and neglects to consider the potential influence of taxation or tax framework on the promotion of inclusive growth.

Oyinlola and Adedeji (2021) posited that disaggregated and aggregated taxes favour inclusive growth. The study concluded that human capital and taxation are effective strategies for fostering equitable growth. According to their research, the interaction between taxes and inclusive growth indicates that indirect and direct taxes have a favourable influence on inclusive growth through the health indices of human capital. However, it shows that only the trade taxes increase the effect of education on inclusive growth.

Salihu, et. al (2024) examined the extent to which tax structure can make sub-Saharan Africa inclusive using panel linear and non-linear ARDL model. The findings showed that progressive tax structure, public expenditure on education and trade openness have long run positive impact on inclusive growth. However, the regressive tax structure has a negative but significant impact on inclusive growth. The study further showed that the positive impact of progressive tax outweighs the negative impact of regressive tax on inclusive growth. Therefore, it emphasised that economic growth of sub-Saharan Africa becomes more inclusive when people with broader financial shoulders carry the heaviest tax burden.

Salihu, et. al (2025) investigated the effect of tax design on inclusive growth of three main income groups in sub-Saharan Africa using panel asymmetric ARDL model. The findings showed that all the individual income group do not only identify with non-linear or asymmetric relationships between tax progressivity and inclusive growth but also recognise the significant and positive long

run effect of progressive tax on inclusive growth for low income, lower middle income and upper middle income group respectively. However, it found that inclusive growth increases faster with progressive tax than decrease with a regressive one in low income and upper middle-income groups. It further showed that regressive tax spur inclusive growth among the group of countries in low income class in the short run.

Most of the studies adopt absolute tax figures instead of its progressivity to distribution prowess (Gashi et al., 2018; Orcan, 2009; Stoilova, 2017). There has been no obvious effort to use ARDL modelling technique to explore the nexus between progressive tax and inclusive growth with special focus on resource economy like Nigeria. Finally, the comparative analysis of how oil tax progressivity and non-oil tax progressivity affect inclusive growth in Nigeria remains unexplored.

3.0 METHODOLOGY

The model here is based on the effect of tax on inclusive growth, which is grounded in the use of the modified macro concept of concentration curve (Anand et al., 2013) and endogenous fiscal policy or political economy (Barro and Sala-i-Martin, 1992).

$$GDPPE_t = \sigma_0 + \theta_1^0 Tax_t + \theta_1^0 X_t + \varepsilon_t \quad 5$$

Where GDPPE is GDP per person employed. The variable X is a set of other growth and inequality determinants. These variables include political instability and expenditure on education (Lee & Gordon 2005; Olanrewaju et al., 2019; Yinusa et al., 2020). The macro data volatility-based index developed by Kakinaka and Pereira (2006) was adopted to measure the tax progressivity index $(Tax_T = \frac{\hat{\sigma}T_t}{\hat{\sigma}Y_t})$. Where $\hat{\sigma}T_t$ is the tax revenue proportional standard deviation in period t , and $\hat{\sigma}Y_t$ is that of the income in period t . Kakinaka and Pereira defined proportional standard deviation as standard deviation value divided by the mean value.

The tax progressivity is broken down into non-oil tax and oil tax. The tax progressivity index is classified into two in order to examine the connection between inclusive growth and each component of tax based on popular grouping in Nigeria tax environment.

$$GDPPE_t = f(Noil_Tax_t, Oil_Tax_t, X_t) \quad 6$$

The ARDL estimation technique is based on the approach proposed by Pesaran et al., (2001). Thus, the model is extended as follow.

$$GDPPE_t = \theta_0 + \sum_{i=1}^p \delta_i GDPPE_{t-i} + \sum_{i=0}^{q_1} \theta_{1i} Noil_Tax_{t-i} + \sum_{i=0}^{q_2} \theta_{2i} Oil_Tax_{t-i} + \sum_{i=0}^{q_3} \theta_{3i} PS_{t-i} + \sum_{i=0}^{q_4} \theta_{4i} GCEXP_{t-i} + \varepsilon_t \quad 7$$

Equation 7 can therefore be used to quantify the effect of oil tax progressivity, non-oil tax progressivity and other determinants on inclusive growth. Data for the analysis is sourced from World Bank, Federal Inland Revenue Service (FIRS), Development Indicators (WDI) and PRS group -International Country Risk Guide (ICRG). The data covers Nigeria from 1991 to 2023.

4.0 RESULTS AND DISCUSSION

Based on the results of the ARDL model within the inclusive growth framework, the relationship among the variables was analysed. The first part of the analysis involved descriptive statistics, followed by stationarity tests to examine the time series properties of the data. The study then proceeds to assess the impact of tax progressivity (i.e., in oil tax revenue and non-oil tax revenue), political instability, and government expenditure on education on inclusive growth.

4.1 Descriptive Statistics of the Variables

The descriptive statistics of the variables used in this estimation are presented in Table 4.1, which displays the mean, median, standard deviation, minimum, maximum, skewness, kurtosis, Jarque-Bera statistic, p-value, and number of observations for all variables.

Table 1. Descriptive Statistics

Variables	LOG(GDPP E)	LOG(NOIL_TA X)	LOG(OIL_TA X)	LOG(P S)	LOG(GCEX P)
Mean	9.23	6.26	6.45	-0.54	2.35
Median	9.29	6.69	7.11	-0.60	2.45
Maximum	9.54	9.68	8.66	-0.30	4.15
Minimum	8.87	1.69	3.20	-0.78	0.94
Std. Dev.	0.24	2.03	1.68	0.15	0.59
Skewness	-0.28	-0.47	-0.65	0.58	0.17
Kurtosis	1.44	2.42	1.96	1.93	4.84
Jarque-Bera	3.67	1.65	3.69	3.30	4.68
Probability	0.16	0.44	0.16	0.19	0.10
Observations	32	32	32	32	32

Source: Author's computation (2025)

The mean values of the variables are seen to be very consistent as they all lie within the range of their respective minimum and maximum values. The standard deviation of the variables is relatively small. The skewness statistic shows the lack of symmetry in a frequency distribution. The kurtosis statistic depicts the flatness of the graph of a frequency distribution, especially showing that the variables are relatively flat.

4.2 Stationarity Tests

Prior to estimating the model, the stationarity test was conducted using two methodologies as presented in table 4.2.

Table 2 Stationary test

Variables	Stationary	ADF	PP	No. of Methodologies Supporting H0	Order of Integration
Log (GDPPE)	Level	0.575 (0.835)	1.034 (0.917)	None	I(1)
	1st Difference	-2.453 (0.016)	-2.401 (0.018)	Two	
Log (NOIL_TAX)	Level	1.036 (0.916)	2.842 (0.998)	None	I(1)
	1st Difference	0.305 (0.766)	-1.881 (0.048)	Two	
Log (OIL_TAX)	Level	1.264 (0.944)	1.773 (0.979)	None	I(1)
	1st Difference	-5.301 (0.000)	-5.300 (0.000)	Two	
Log (PS)	Level	0.675 (0.856)	0.318 (0.772)	None	I(1)
	1st Difference	13.621 (0.000)	13922 (0.000)	Two	
Log (GCEXP)	Level	0.803 (0.881)	0.342 (0.777)	None	I(1)
	1st Difference	-7.893 (0.000)	-0.797 (0.000)	Two	

Source: Author's compilation (2025)

From the results, all the variables used in the estimations are non-stationary at level. However, it was seen that log(GDPPE), log(Noil_Tax), log(Oil_Tax), log(PS) and log(GCEXP) are stationary at first difference, hence, they are integrated of order I(1). Since all the variables are of the same order, ARDL bounds testing approach to cointegration, apply.

4.3 Autoregressive Distributed Lag Estimation

The short-run coefficients from the cointegrating form provide insights into the immediate impacts of the explanatory variables on inclusive growth. The Non-oil tax progressivity coefficient (0.093279, $p = 0.0006$) shows that a 1% increase in the non-oil tax progressivity leads to a 0.093% increase in inclusive growth in the short run. This positive and statistically significant effect aligns with literature suggesting that progressive taxation in non-oil sectors can enhance income distribution and foster inclusive growth (Piketty, 2014; IMF, 2014). However, the non-oil tax progressivity has a statistically insignificant positive effect on inclusive growth in the long run. This contrasts with short-run findings and may suggest diminishing returns to tax progressivity over time, possibly due to tax evasion or inefficiencies in revenue utilization, as noted in studies like Besley and Persson (2014).

The short-run effect of oil tax revenue progressivity (0.003543, $p = 0.627$) is positive but statistically insignificant. This is consistent with findings in resource-dependent economies, where

oil revenue volatility often weakens its immediate impact on growth (Arezki & Van der Ploeg, 2011). However, a 1% increase in oil tax revenue progressivity increases inclusive growth by 0.099% in the long run. This significant effect underscores the importance of oil revenues in resource-dependent economies, consistent with findings by Sachs and Warner (1995), who highlight the role of resource rents in sustaining growth when managed effectively.

Table 3 ARDL cointegration and Long Run form

Variable	Coefficient	t-Statistic	P-value
Long Run Equation			
Log (NOIL_TAX)	0.031	1.403	0.175
Log (OIL_TAX)	0.099	2.884	0.009
Log (PS)	-0.577	-2.338	0.029
Log (GCEXP)	0.175	2.521	0.019
Constant	8.267	87.432	0.000
Short Run Equation			
DLog (NOIL_TAX)	0.093	3.996	0.001
DLog (OIL_TAX)	-0.004	-0.489	0.629
DLog (PS)	-0.124	-2.591	0.017
DLog (GCEXP)	-0.215	2.318	0.030
Cointeq(-1)	-0.215	-6.489	0.000

Source: Author's Computation (2025)

Political instability estimated short run coefficient of (-0.124, $p = 0.0167$) depicts that a 1% increase in political instability decreases inclusive growth by 0.124% in the short run. More also, political instability has a significant negative effect on inclusive growth in the long run, with a 1% increase in the instability index reducing inclusive growth by 0.577%. This aligns with the broader literature (Aisen & Veiga, 2013; Acemoglu et al., 2019), which consistently finds that political instability undermines long-term economic performance by deterring investment and disrupting policy continuity.

Government expenditure on education: The short run result shows that a 1% increase in government expenditure on education reduces inclusive growth by 0.22% in the short run. However, it raises inclusive growth by 0.18% in the long run. This strong positive effect supports findings from human capital theory (Barro, 2001; Hanushek, 2013), which emphasize education as a critical driver of inclusive growth through improved productivity and equity.

The negative and significant error correction term indicates that 21.53% of any disequilibrium in inclusive growth is corrected annually, confirming the presence of a stable long-run relationship. This adjustment speed is moderate, consistent with ARDL models in developing economies (Pesaran et al., 2001).

Table 5. Diagnostic Test

Test	F- statistic	P-value
Ramsey RESET	0.218	0.645
Breusch-Godfrey	0.136	0.998
Breusch-Pagan-Godfrey	1.172	0.359
Skewness	-0.169	
Kurtosis	3.799	
Jarque- Bera	0.972	0.615

Source: Author's computation (2025)

The Ramsey RESET diagnostic test yields statistically insignificant results ($p = 0.6453$ for F-statistics), indicating that the null hypothesis of no misspecification cannot be rejected. This suggests that the ARDL model is correctly specified, with no significant evidence of omitted variables or incorrect functional form.

ARDL bounds test with F-statistic (12.85230) is well above the upper bound (I(1)) critical values at all significance levels (5.06 at 1%), strongly rejecting the null hypothesis of no long run relationship. This confirms a stable long-run relationship, reinforcing the main model's findings that non-oil tax progressivity, oil tax progressivity [log(noil_tax)], political instability [PS], and education expenditure [GCEXP] are significant drivers of inclusive growth in the long run. It aligns with Smyth (2005) and Pesaran et. al (2001), who detected cointegration in models with fiscal and institutional variables.

Breusch-Godfrey test yields statistically insignificant results, indicating that the null hypothesis of no serial correlation in the residuals cannot be rejected. This suggests that the ARDL model does not exhibit significant serial correlation, supporting its specification in capturing the dynamic relationships among the variables.

The Breusch-Pagan-Godfrey test depicts statistically insignificant results, indicating that the null hypothesis of homoskedasticity (constant variance of residuals) cannot be rejected. This suggests that the ARDL model's residuals do not exhibit significant heteroskedasticity, supporting the reliability of the standard errors and statistical inferences in the main model.

The residuals from your model are statistically compatible with a normal distribution. There is no significant evidence of non-normality based on skewness or kurtosis. The test comfortably passes at conventional significant level. The Jarque-Bera is significantly supportive of the model residual normality assumption.

5.0 CONCLUSION AND RECOMMENDATIONS

This study examines the determinants of inclusive growth in Nigeria, employing an Autoregressive Distributed Lag (ARDL) model to investigate the effects of oil tax progressivity, non-oil tax progressivity, government spending on education, and political stability. The results confirm a stable long-term cointegration relationship with significant effects over time. Oil tax progressivity and government education spending have a positive influence on inclusive growth, while political instability significantly restricts it. Non-oil tax progressivity shows no significant long-term impact. In the short term, non-oil tax progressivity, education spending, and political instability all significantly affect inclusive growth, whereas oil tax progressivity remains insignificant. The surprising negative short-term coefficients for education spending, along with the negative short-term contrast with the prior research (Piketty, 2014; Abdel-Kader & Mooij, 2020), suggesting potential model-specific dynamics or data constraints. These findings highlight the critical roles of education investment and oil revenue management in promoting inclusive growth, while emphasizing the harmful effects of political instability and the limited long-run impact of non-oil tax progressivity in Nigeria's context.

The following policy recommendations are suggested to promote sustainable, inclusive growth in Nigeria: Policymakers should strengthen non-oil tax progressivity by improving tax administration to sustain its significant short-term impact, while addressing its negligible long-term effect through reducing tax evasion. Increasing investment in education is crucial, given its substantial positive effects in long term, to boost productivity and equity. Careful management of oil revenues is vital to maximize their major long-term contribution and to reduce volatility. Political stability must be prioritized to mitigate its notable negative long-term impact and unforeseen short-term effects.

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